



IUCEL 2018

INTERNATIONAL UNIVERSITY
CARNIVAL ON E-LEARNING

**OPEN
TO ALL**

HUMANISING TECHNOLOGIES



12th - 13th
September 2018



8.00 a.m. - 5.00 p.m.



International Islamic University
Malaysia Cultural Centre
(ICC)

IIDEL

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Exhibitions

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PROCEEDINGS OF THE INTERNATIONAL UNIVERSITY CARNIVAL on e-LEARNING (IUCEL) 2018

Joint Organizers: Ministry of Education Malaysia,
International Islamic University Malaysia (IIUM), MyCEL and MEIPTA
12-13 September 2018
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SUMMARY OF IUCEL 2018 PROCEEDINGS

The proceedings of IUCEL 2018 consists of 181 papers from the participation of participants in the category of Invention, Innovation & Design on e-Learning (IIDEL) in IUCEL 2018. IIDEL category is a competition for academics and students of higher learning institutions to showcase their product and compete – product e.g., multimedia tools, computer applications, mobile applications, and systems.

The objectives of the competition are as follows:

- a) Exhibit research, creation and innovation in teaching and learning by faculty's members and students.
- b) Share expertise and commercial, creative and innovative ideas.
- c) Cultivate interests and encourage lecturers, and students to develop teaching materials in line with current technological developments

All papers in the IIDEL category were reviewed by the internal and external reviewers during the pre-submission of the abstract. The participants are coming from various universities and colleges all over the world.

This year of IIDEL participation in IUCEL 2018 has shown a slight increase number of 198 innovative ideas, practices and products in e-learning compared to IUCEL 2017. The sub-themes of the participation in IIDEL category are Learning Technologies, e-Learning, Pedagogy, Digital Technologies, Instructional Design, Computer Supported Collaborative Learning, Digital Technologies in the Disciplines, Educational Gaming, Educational Robotics, Virtual and Augmented Reality in Education, Wireless, Mobile and Ubiquitous Technologies for Learning, e-Assessment – Theories and Methodologies, Big Data in Education and Learning Analytics and Affective Computing in Learning.

The Launching of IUCEL 2018 - Rector's Speech



PROF. TAN SRI DATO' DZULKIFLI ABDUL RAZAK

Alhamdulillah, I would like to congratulate the Centre for Teaching and Learning (CTL) of IIUM on successfully hosting this year's international University Carnival on e-Learning (iUCEL) jointly with the Ministry of Education, MEIPTA, MyCEL, and from the Industry Partnered by PETROSAINS and Openlearning. I would like to thank all staff of IIUM and the partners who put long hours and commitment to make this programme a success. I hope your continuous efforts to organise such programmes where new ideas and knowledge are generated will benefit all of us.

IIUM's involvement in organising this event represents our persistent attempt to keep pace with new developments in the field of teaching and learning globally in this age of technological change and innovation which is also dubbed as the Age of Loneliness, and unsustainability including that of technology per se. While it cannot be denied that modern technology has been evolving very fast and is pervasive in both our daily personal and professional life, like all things in the "modern" world it has its downside which is not well articulated, unintended or otherwise.

Therefore, the importance of organising such conferences cannot be overemphasised provided the aim is to identify mechanisms to ensure the development of a balanced and harmonic person as stipulated by the National Philosophy of Education, and indeed in the Qur'an.

IIUM's Constitution enshrines the vision of the Islamisation of Human Knowledge (IOHK) and the concept of seeing ideas in various disciplines from Islamic perspectives in all modes of academic work. As our Memorandum and Articles of Association states: "Inspired by the worldview of Tawhid and the Islamic philosophy of the unity of knowledge as well as its concept of holistic education, [IIUM] integrates Islamic revealed knowledge and values in all academic disciplines and educational activities." In recognising this, I believe the outcome of this conference will have positive impacts in all areas of our academic practices.



We at IIUM fully appreciate the importance of academic research and are guided by the contents of verse 122 of Surah Al-Taubah. The essence of the verse requires a group of dedicated people among us to devote their time and energy to research and developing scholarship in order to guide the larger community. Islam has placed huge emphasis on knowledge for upliftment of humanity and thus making it obligatory.

On the same note, the Malaysian Ministry of Education emphasises enhancing learning culture in academic institutions to promote knowledge generation, sharing and co-learning beyond mere technology. We in IIUM are ready to be a team player with our counterparts from all other institutions of higher learning to create and provide a more holistic and balanced education at the national and global level to support innovative teaching and learning activities. We owe our gratitude to the Malaysian e-Learning Council for Public Universities (MEIPTA), Malaysian Centre for e-Learning (MyCEL) and Ministry of Education for facilitating this e-learning carnival. iUCEL 2018 has an added significance for the IIUM community, as we are one of the main organisers and honoured to welcome everyone to our Garden of Knowledge and Virtue. We hope that it will act as a platform to promote, explore, and share best practices and global expertise in e-Learning applications at all levels of learning institutions from all over the world rooted in virtues that ensure knowledge remains relevant for a sustainable future.

By putting the "right" emphasis on the use of technology for educational purposes, we are reminded that technology is there for our use, and not vice versa. We should not dehumanise ourselves with the forces of modern devices knowingly or otherwise such that our human intelligence, more specifically primordial intelligence (fitrah or karma) are undermined by the use of technology. We need to persistently remind ourselves that technology must be there to serve human needs, but ensure we must not be enslaved to technology and devices. Evidences to this effect is getting more and more evident as we research deeper into the evolution of technology. Indeed, the late Stephen Hawking and Albert Einstein had forewarned us as to what to expect if technology is given a free reign to determine what the future is about. Hence, we see Japan started talking about 5th Social Revolution and choose not to be bonded by the 4th Industrial Revolution in meeting their future needs. No doubt technology and human needs in today's world have been enmeshed in a way which has never happened before, but humans must have the upper hand in ensure human dignity is not compromised. This is one of the six overarching goals stipulated in the UN Sustainable Development Goals or better known as Education 2030 and not Education 4.0 as some dubbed it without any meaningful purposes.

Many of us do not realise how technology is changing our life and controlling our intellectual capacity in a manipulate way, and concurrently destroying many of our long-held values, virtues and relationships. It has been showed that the level of trust must be enhanced as technology advances. Yet the reality today is that we are expering severe trust-deficit thus allowing corruption and ethical practices to creep in more insidiously. The academic world is not exception among students and even professors alike. This concern must be first addressed before e-Learning can be a meaningful educational tool that is values-based. We need to analyse the correlation between availability of technology and its impact on the development of competencies involving trust and trustworthiness and not just innovation as often cliched as



"innovate or die." The fact of the matter is that, technology can stultify human dignity if wrongly used.

I am sure most of us here are aware that the wrong use of technology may diminish our ability to communicate effectively and risk the social wellbeing of society (sejahtera) that we are already witnessing amongst the youth especially. When our eyes are glued to smart phones and other screen devices, we tend to detach from those around and thus create unseen boundaries that bound us between members of the family and society. The latest report from the World Health Organisation that classifies "gaming" as an addiction is just the tip of the iceberg. Such irresponsible use of technology can potentially harm the individual and the community as large. At this juncture it reminds me of my involvement as anti-tobacco advocate for more than 3 decades. Screen devices addiction is a *deja vu*.

In my first address to the IIUM Community, I made an analogy between the use of technology to that of a 'toilet'. I know the analogy may sound crude, but the message I want to share is that, we must use technology responsibly and should not be controlled by it. A toilet is an essential, indispensable and integral part of our everyday life; we use it when necessary and do not remain there all the time. Nor do we carry it with us wherever we go. Similarly, while innovating e-learning and promoting its use in academic activities, we must remember that if we are fully and obsessively depend on it then "real" education and learning stops. Instead it becomes a menace to individuals and society at large.

The choice of the motto HUMANISING TECHNOLOGY is spot-on but the question remains is "how" so. I trust the outcome of our discussion with through some light on this such that the e-learning is also understood as "ethical"-learning where trust and trustworthiness is the centrepiece of what learning is all about to promote sustainable use of technology for the benefit of humankind.

I wish all participants a successful conference and welcome to our Garden of Knowledge and Virtue. In the Name of Allah the Most Compassion and Merciful, I officially declare the 2018 iUCEL open.



ABOUT IUCEL 2018

OBJECTIVES

The carnival will be a platform for a number of events and activities that revolves around e-Learning and is aimed for learners, scholars, educators, practitioners, researchers, innovators and related industries. The events and activities include conference, research exhibitions, competitions, industrial showcase, and workshops. The focus of the events will be on best practices, innovations, research and product showcases for e-Learning.

THEME

Humanising Technologies .

PARTICIPATION

The e-learning carnival welcomes the participations of learners, scholars, educators, practitioners, researchers and innovators from all teaching and learning institutions as well as from related industries. Participation can be made through paper presentation, poster and product presentation, research showcase and attending practical workshop and showcase.

DATE

12th – 13th September 2018 (Wednesday – Thursday)

TIME

9.00 AM – 5.00 PM

VENUE

IIUM Cultural Centre (ICC), Gombak Campus

OFFICIAL WEBSITE: <http://www.iium.edu.my/iucel2018/>

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TOPIC: Improving Digital Native Audience Engagement during Learning Event with QR Code Technology
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Abstract: A learning event is a planned and managed experience that helps those involved learn new knowledge, skills, attitudes and behaviour. Presenter are regularly need to handle situations where throughout common learning event activities like talks and workshops, "Digital Native" audience get distracted easily by their mobile devices, gadgets and internet. "Digital Native" is a term used for people who were born in the digital era. Their preferences are to view visuals, videos, games and to examine shorter text rather than thoroughly read longer text. They are not inspired by passive learning but participatory culture is their norm. Due to this situation, learning event presenter need to adapt this learning style and tap into applications and technologies that are second nature to them. QR code is originally created for industrial use and has quickly swept across the world due to grasp root of campaigning and a basic need of a bridge between the real world and the digital world. Besides being a very useful tool in marketing, QR code is starting to emerge in other areas and are even beginning to be used in improving learning experience. It can be used to engage the "Digital Native" audience by providing access to the presentation online resources, get instant feedback and conduct question and answer (Q & A) session during the learning event. These kind of activities are the most common component of learning event and QR Code can improve audience commitment and possibly create better interactions between the presenter and the audience.

Key words: QR Code, Learning Event, Learning Strategy, Learning Tool, Digital Native

Introduction

The idea of using games to engage learning event audience in the process of active learning is not the new method of learning. Over the past several years, presenters have been increasingly incorporating various games into their presentation in an effort to create a fun and engaging learning environment for "Digital Native" audience (Kasinathan, Abdul Rahman & Che Abdul Rani, 2014). Although this can be very challenging and time consuming, interactive, collaborative and competitive games tend to motivate and encourage audience participation in the learning process. There are many interesting open-source games-based educational tools that can be used to improve audience engagement nowadays, and QR Code is introduce as a medium to provide more selections for presenters to inspire them to be more creative inside and outside learning space.

Description

QR codes is evolving rapidly and widely used in many aspects. The vision behind QR codes is simple, just quick scan a surface with a smart phone and get a quick response in the form of website URL, email address, messages, multimedia contents, instructions or other digital information that can be displayed on the smart phone and mobile device (Ramsden, 2008; Sharma, 2013). During or after learning event, QR codes can be used as a medium to ask for feedback. According to Pavelin, Pundir and Cham (2014), asking for feedback in the interactive workshop format is the best way to learn what works for the presenter and audience, and it shows the audience that the presenter value their input.

Sharon Morris from Colorado State Library developed a framework (Figure 1) that can be used as a guideline to design a learning event which could improve both audience proficiency and audience engagement during and after learning event. Based on the framework, she identified 5 learning event styles of conducting learning event which is Tell, Share, Inquire, Experience and Create. The usage of the QR Code is suitable to support 'Inquire' and 'Experience' style (highlighted in Figure 1) which will improve the audience expertise and audience experience compared to 'Tell' and 'Share' styles.

In the 'Inquire' style, the presenter content will be conveyed through Socratic Method of questions, discussion, conversation and social learning while the audience need to reflect, respond, discuss and share expertise. The Socratic Method is a form of cooperative argumentative dialogue between individuals, based on asking and answering questions to stimulate critical thinking and to draw out ideas and underlying presumptions (Anderson & Bellenkes, 2013). During the learning event, the QR Code that has been pre generated will be shared to the audience to collect the questions from the floor and conduct a survey. The audience will scan the QR Code and start posting questions or answer the survey in real time. The results from both activities will be discussed or summarized by the presenter right after the data collected.

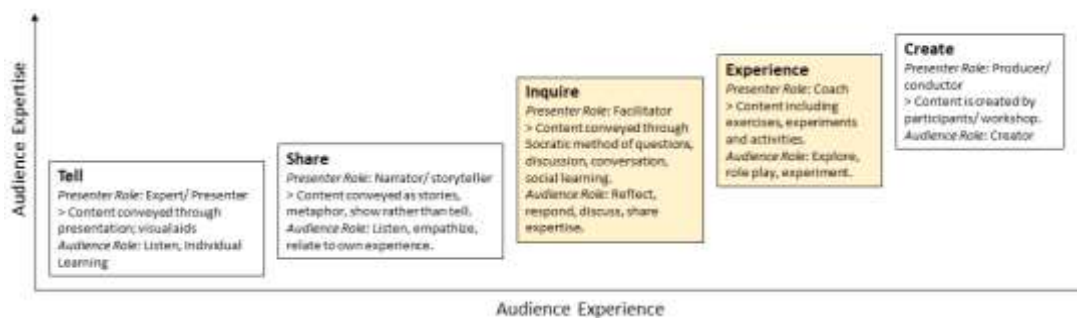


Figure 1: Designing Learning Events Framework (Morris, 2014)

In the 'Experience' style, the presenter role is to coach the content which including the exercises, experiments and activities. The audience role during this component are to explore, role play and experiment. To test the audience expertise and enhance audience experience, a QR Code based games can be conducted at the end of the learning event. To answer the question, the audience need to scan the pre generated QR Code from their mobile phone and start answering random questions. The participants can be rewarded based on the correct answers and the audience can participate it individually or in group. This kind of activities and reward not only promote good behavior and hard work, but it is also beneficial to the presented-audience relationship.

A purpose developed web application will generate unique QR Code for each interaction or activity. The summary of the activities that can be conducted during a learning event to support 'Inquire' and 'Experience' learning event styles summarized in the Figure 2 below.

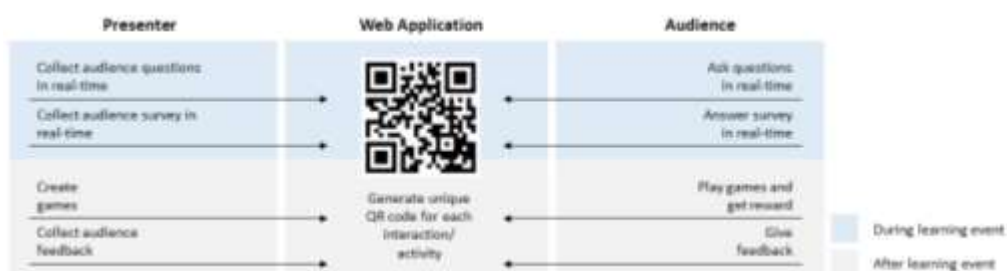


Figure 2: Activities that can be conducted during a learning event using QR Code

Conclusion

Presenters are generally willing to adopt new technologies, but not at all costs. What they want, above all, is simplicity and efficiency. They do not have time to explore with complicated tool and software or other presentation devices and tools. This is why QR codes are becoming a popular medium in modern presentation. They combine speed, ease and novelty with the capacity to hold a large amount of data and can actually do a lot to enrich any learning even session. The main objective of this innovation is to provide a flexible tool to create QR codes based learning activities to support various learning event styles.

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ID NO. APU 002
**TOPIC: INDONESIAN HISTORY-BASED E-LEARNING
APPLICATION FOR PRIMARY SCHOOL STUDENTS: LE
HISTORIA**

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Abstract: In this digital age every human must be able to adapt to the rapid changes. It is necessary to habituate itself against new technologies that are fast developing to compete internationally. Technology can also be applied to school activities. One of the problems that occur in education in Indonesia is the lack of motivation to learn from the students themselves, as well as least innovation used in teaching and learning activities. One of the subjects that the students are not interested was the subject of history. In Indonesia, history textbooks are dominated by texts and questions. The lack of illustrations and pictures makes the students less interested in learning history. Innovation for education in Indonesia is necessary to develop students' learning interest. Innovation can be anything that includes how to teach in school, especially for the subject of history. Technology aids and assists to provide innovative teaching and learning activities. E-learning can be said as a combination of teaching and learning and technology. E-learning can be applied to overcome the problems of education in Indonesia. Teachers can use e-learning to present new learning methods, fun and innovative. E-learning aims to motivate students to learn and understand what is taught by the teacher quickly. E-learning developed by the developer is a website that contains school subjects with the delivery method of animation. There is also a quiz that can be done by the students after watching the animation subject. Website selected for the maintenance process easier and cost-effective.

Key words: *e-learning, interactive learning, primary school.*

Content

Currently in Indonesia, there are still many problems that occur in the education area. An example is, the number of primary school teachers is not proportional to the number of students to be taught. Primary school teachers for the 2015-2016 school year numbered 1,648,077 teachers. While the students to be taught amounted to 25,885,053 students (Kementrian Pendidikan dan Kebudayaan, 2017). This means that one teacher should teach about 16 students. It is assumed that students and teachers are spread evenly throughout Indonesia. In fact, the distribution of teachers and students is uneven. For the learning process to be maximal, the teacher must have an efficient and fun learning method. The teacher should also pay attention to each student to ensure that the material presented is well understood by the students.

"In Indonesia, a bad learning culture is created among the people." (Sanjaya & Budimanjaya, 2017). This bad culture causes students to commit acts that violate the norm, such as cheating and lying. This can be bad for the students themselves. In addition, there are teachers who deliberately score the student regardless of the student's ability.

Many teachers are more comfortable to teach when the classroom atmosphere is quiet, where the teacher is the only one who talks to explain the subject matter to students in his class (Hamilton, 2015). However, students can learn more actively with the help of technology. Students tend to be more active



so that the taught material is more easily understood. In the history subject that are included in social science in Indonesia, many teachers still use the above methods. The teacher does not include students in the learning process. The quality of social science subject in Indonesia, especially history lessons, is also influenced by the parent's assumption of the subject matter. Parents assume lesson history is less important than other lessons and cannot be applied to everyday life (Susanto, *Pengembangan Pembelajaran IPS di SD*, 2014).

From the above problems, the development of the world of Education in Indonesia is still much to be addressed, especially with the existence of a bad learning culture. Innovation in the learning process at school is needed to overcome the above problems. Exciting technologies suitable for primary school students are video and game. The combination of the two technologies can present an innovative and fun learning method.

Website is one platform that allows data transfer with ease and cheap. It also will not take up much space in the storage memory of the school computer. Students who want to access home are also easier to gain access to this application. This application will be a good way to introduce students that technology is not only for gaming, but also become a learning media. Besides that, by using the application, students will not realize that he is learning while playing. Teacher also can have extra time to pay attention to each student.

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ID NO. APU 003	TOPIC: 3D HEART ANATOMY AUGMENTED REALITY: C-HEART

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Abstract: For this project, we; a team of consists of two developers, created a unique augmented reality (AR) internal organ in 3D. We created a mobile E-learning application that shows the human heart. This application will include the multimedia elements which are audio, video, graphics, and text. The information is obtained from the internet and through interviews with the doctors from Banjarbaru City Hospital, Banjarbaru, Indonesia. The AR mobile application will include a trailer, realistic sound effect, 3D interactive model, and a promise for future updates. The methodology that we used is ADDIE design methodology; a standard waterfall development model. In general, the application of Augmented Reality hopefully can be implemented to medical e-learning system, especially in Indonesia. To improve the school education system, it is necessary to develop a learning method in the classroom. Plus, the development of technology in the community will facilitate the way of learning and teaching that many people love. Sophisticated equipment is growing like smartphones used by the Indonesian community is estimated at 83.5 million people (Kata Data, 2016). From users of adults to children, they are already active users using smartphones as a tool for communication, work, recordings, and entertainment. From that perspective, the advantages of smartphone will be benefits for educational field. The new way of learning, new interaction, new experience, and beside that it will improve learning efficiency in terms of time, place and cost.

Key words: *Augmented Reality, Human Organ, Heart, 3D Object, eLearning, Mobile Application*

Content

The teaching technique has always evolved to the present day. Where in the time before the world war, education system has been applied in some countries. Starting from an institution, school and an academy aimed at the military at that time. Establishment of schools with an educational system for many students. Starting from the science learned from textbooks, handheld device, until the computer and other electronic appliances, came to facilitate the work. While technological advances, there are now many easy teaching methods and much liked by people.

Now, many schools are implementing online systems for students and teachers. Supported by smartphone in every high school student and school computer for all students. The more advanced the times, the more sophisticated the technology also exists. The students also like the new technology that is always developed. In biology lessons, biology is part of an important science that is learned. In one part of the lesson is the anatomy of human. With the advancement of this technology, photos become video, video can be a virtual object, that is augmented reality. "Virtual Human Internal Organ Anatomy" is about learning human organ body structure and its contents with AR technology. This application allows users to explore parts of the organ as virtual objects, such as 3D brain, 3D heart, 3D lungs and components as the original human organ. In addition, the AR application displays the name and description of each component).

Studying human body organs structure is one of the basic and important subjects in biology. The different structures and components of organs allow us to know how it works and what its function. The heart, lungs, and stomach of human have its own function and work. Different organs can work together to perform a common function. Like how the parts of digestive system break down food. One integrated unit referred as an organ system. Therefore, biology has something interesting and useful to learn. Many obstacles are experienced by the students in remembering the names of the structure and function. With the development of technology, there are various ways people learn and practice it. Starting from books, computers, hand tools, and other electronic devices. The choice of students to learn depends on those who can use and access the various technologies and infrastructure available in each school. Nowadays, people's lives are transformed into modern generations, everybody now can online, and the smartphone users is forecast to grow, with around 223 million of smartphone users in 2017 (Statista, 2018). From student to worker person are using the smartphone for communication, business, entertainment and education also gain information which can be reach in internet. It can motivate researchers and technology developers to make education and information dissemination easy and fast. Surely it will develop the business for the developer company and develop the school in time and the right place. Today there is the latest technology that can combine the digital world and the real world to simplify the work and become a fun new experience which called augmented reality and virtual reality technology.

Based on the problem background above, a mobile application for "Augmented Reality Internal Organs in 3D" final year project will be created to give people like high school student, medical students or citizens more interactive biology education and give much conveniences also to encourage them in biology and science. The advantages will be convenience learning for anyone because it provides online and offline material. Besides that, this also provide interactive learning and entertainment. The children can play and learn while see the heart that beat from the smartphone. The teacher has much attention from the student.

With smartphone in hand, no more study just at school, student can explore the human internal organs by himself anywhere and anytime. Cost saving from buying the 3D wood model for human internal organs that can only use in school. School does not need to give extra space for human organ model.

Higher learning satisfaction in tutorial, since the modernization of technology and science, learning more meaningful. Much convenience for student and teacher to conduct practical lesson in the class as well as out the class. Eye-catching tutorial or presentation by capture the attention of audience that will learning motivation engagement because the interaction and uniqueness are there.

Acknowledgement (if any)

I would like to thank God for the completion of this investigation report that complete on time without handling any sickness and sudden constrain. For our teachers and supportive supervisor, Ms. Aida Zamnah Binti Zainal Abidin, who gave me motivation again and again, the learning, and guidance to continue to grow and not to repeat the mistakes of errors from experienced student in making this report.

Mr. Tukiman and Mrs. Rabiah who always pray for me to always be given the ease and smoothness in achieving our goal, unconditional support and give support in mental and financial. Thank you, for always loving me and my brothers to support wholeheartedly for what I do for the future.

I, personally, would also like to give my thanks to the group members, Petrus Bayu Cristnawan, for the assistance in completing the assignment, without him, this assignment would be littered with difficulty. As well as my friends who always support us when I am distress in facing a problem. I would like to thank them, but I cannot say the name one by one. I will always remember what they have done. And thank you all who help me completing this report. I hope I can pay your kindness later, but I always pray for your life.

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ID NO. DIU 001	Topic: Technogagement: Enhancing Student Engagement through edTech tools

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Highlights: What student engagement trends do you predict for the future? We're not really thinking about true engagement that leads to deep learning. This purpose of the study is to determine that whether videos are the powerful edTech tool to engage the students inside the classroom as well as outside the classroom. The results of the practical method, done in the classroom, show that the videos are more effective when the teachers create the videos by themselves using Screencast tools as it directly relates to their specific subject areas. After watching the videos after uploading in the online platform by teachers, students take notes using online tool VideoNot.es and they share their ideas and observation in the classroom. Based on the understanding level the teachers do their assessment on online and also can grade them using another tech tool, Google form. In other words, when the teachers use videos of theirs, the students more likely to understand the topic rather than the scattering online videos.

Keywords: Interactive video creation, Student Engagement, flipped classroom, Assessment

Introduction:

Students' engagement in the process of learning has become a burning issue in this era. With the advancement of technology, it is difficult to confine the students in the four walls of classroom. They learn rapidly when they have technology in their hand as it brings the world closer and one can easily grab the information. For maximum engagement, technology tools in learning must appeal to social motivation, have opportunities for creativity, personalize the content and experience, engage a mentor or teacher, and provide interactivity and immediate feedback.

Screencasts are an effective instructional format that can be used for tutorials, demonstrations, digital storytelling, and narrated PowerPoint presentations. While the videos are seen by the students they can take notes and share with other students. An interesting part is that, the students do not need to save them. It is automatically saved in Google Drive. The discussion about the content in the classroom fulfil the requirements of Flipped classroom as they will have a concrete discussion and previous knowledge about the topic. The next important part of their study is to assess them. It can be done by using the Google Form instantly in the classroom. Teachers can even take it from outside of the classroom too.

Background:

Too many institutions are thinking within the box of learning management system options, social media, the course, and even the institution. We need to think from the perspective of the learning first and what it really takes to learn deeply in ways that change a person's ways of thinking, doing and relating. However, it's when a student engages himself or herself in that cognitive dissonance that Gladwell,

Kegan, and others talk about that learning really occurs at new levels and reveals a person to himself or herself in ways that allow real change. Educators in today's classrooms must be able to use and integrate both current and emerging technologies. One of the keys to effective 21st century teaching is to balance traditional pedagogical methods with the effective use of technology to foster learning. Visuals can also be utilized to challenge students to think on levels that require higher order thinking skills (Smith & Blankinship, 2000). Finally, technology provides opportunities for teachers to meet the needs of students with various learning styles through the use of multiple media (Bryant & Hunton, 2000).

The Technogagement process

Why Self-Created Videos?

Do the students remember what they read? Can they apply it? These questions are the prime issues at present time. The studies find that people remember the things what they see in front of them rather than just reading the things. A few seconds video can attract audience more than the lines written on the paper. In our teaching, it has become crucial for the teachers or facilitators to be updated with technology. If they use can make interactive videos, students will find them more smart as it will give the students at ease at home. In addition, teachers will get relief from the burden of searching the scattered videos on different channel if they create the videos of their own according to the relevant topic.

The Video tools: There are many tools by which teachers can take into their account for making videos. For this study, the researcher used Screencastify tool that is also an extension of Google.

The Note-taking platform: While watching the videos it may become necessity to take notes for the students. But using pen and paper at this age is a traditional way. In this regard, VideoNot.es is a power online platform where all the necessary materials are integrated. Here the students can watch videos and take notes simultaneously. They can even share their notes with others including teachers. The survey students of the course used this platform to take their notes and have a discussion later on. One of the benefits of this is that the notes are automatically saved in drive and they can access it at any time, from anywhere.

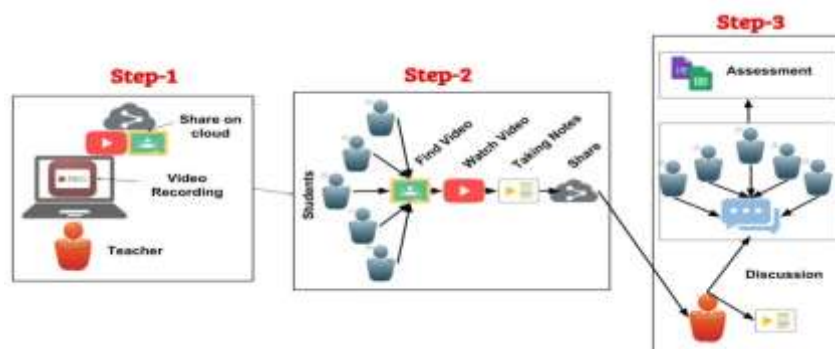


Figure 1: The Technogagement process

Discussion in the classroom

After taking notes, students come up with variety of questions. They need to discuss with teachers for clear understanding. They can talk over with teachers in the classroom on their queries. As a result students come to class having prior knowledge of the content, more interest in the topic, and lessened cognitive overload. This whole process can be described as flipped learning.

Grading Tool



Now, after the discussion part, the teachers need to assess the students what they have learnt. How do you know students have watched the screencast? A Google form lets you create an easy to use web form to track student results. A Google form is automatically connected to a spreadsheet with the same title. When you send or share a form, recipients' responses will automatically be collected in that spreadsheet. From the spreadsheet, teachers can easily grade the students within a few minutes although there are many students to take into accounts.

Benefits for using this method

For teachers: When the teachers create the videos for the related topic once, they can use it in other classes too. On the other hand, teachers can also use Screencasting for a variety of other classroom activities such as reviewing lesson content and presenting online lectures and professional development. Moreover, Google form lets the teachers to assess students' understanding in a broad way in a few moments. Teachers can take quizzes instantly in the classroom.

For Students: VideoNot.es allows the students to take notes instantly and collaborate with other students. Screencasting allows them to learn by example, seeing for instance a step-by-step sequence in great detail or viewing a screencast video directly related to lesson content. In addition, students can watch a screencast video anytime, anywhere and have complete control of the lesson, which means they review any part of the presentation as needed. Screencasts can be delivered via streaming or downloaded in their entirety for later viewing.

The findings from the study

The results of the study indicate that the students' strong preference to the type of the videos that the researcher created for the course. They could understand the topic easily and shared their valuable thought in the classroom. It is possible that the reason was, at present generation, the students mostly spend their time on technology and they feel comfortable using it. New technologies bring new challenges in the field of study but if we grab the advantages of the technologies then the learning process will become easier.

Commercialism

The teachers can use their own videos for commercial purpose. It is not necessary to have learners' physical presence in the class. By using this method, teachers can easily use these as online courses for the global market.

Awards

- Best paper award in the **"Teaching and Learning Expo 2017"** organized by Daffodil Educational Network (DEN).
- Got Bronze medal in "International University Carnival on E-Learning (IUCEL) 2017" organised by Universiti Sains Islam Malaysia (USIM).

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ID NO. DIU 002**Topic: The Role of Moodle in teaching and learning process in Bangladesh****Beauty Akter***Daffodil International University**Dhaka, Bangladesh*[*beautyakter111@gmail.com*](mailto:beautyakter111@gmail.com)**Md. Asif Iqbal***Daffodil International University**Dhaka, Bangladesh*[*aasifiqbaal2@gmail.com*](mailto:aasifiqbaal2@gmail.com)

Highlights: In this work we put forward the investigation of using Moodle at a private university in Bangladesh. Moodle has been used here as an online learning platform in addition to the face-to-face class. Two courses (English and Computer Fundamentals) were under observation for two semesters during the research. This research has been conducted at a private university of a Bangladesh where 657 students were the target group. The aim of this paper is to find out how much effective to use Moodle for virtual learning of the students. It has been found that maximum number of students responded to this online platform positively and their learning was enhanced rather than others as they spend their time in this platform while staying at home too with some few exceptions. By this way, their leisure time, which they like to spend on browsing social media, is spend in virtual learning. It is also found that online self-assessment tools in Moodle helped the learners to assess themselves as well as their peers. Nevertheless, some exceptions have also been found who did not like to interact and some technical issues have also been arisen.

Keywords: Moodle, Teaching and Learning, Bangladesh perspective, LMS

Objective

The objective of this research is to investigate the role the Learning Management System (MOODLE) in students' learning process.

Introduction

Blended learning is a quite new concept in Bangladesh- as it has just started to thrive a few years back. Emerging technologies have surround in the field of education. Blended learning is the combination of both face-to-face and online class. Yen and Lee (2011) assert that "blended learning, thoughtfully combining the best elements of online and face-to-face education, is likely to emerge as the predominant teaching model of the future" (p. 138). Williams, Bland, and Christie (2008) define blended learning as a combination of traditional face-to-face learning and distributed learning, the latter of which

"is an instructional model that allows lecturers, students, and content to be in different locations" (p. 43). Garrison and Vaughan (2008) describe best practices for blended learning implementation in higher education. They emphasize on the connection between the face-to-face and online components to ensure blended learning environment.

Without using any technology, the demand of education is not fulfilled in the current world. If one nation wants to compete with the global arena, it has to introduce technologies in their learning and teaching system. By keeping this mind, many educational institutions are introducing e-learning in their education system.

Background

Blended learning has a positive powerful impact on students' learning in spite of some challenges. Virtual learning helps the learners to increase their technical capabilities and saves their time. Many empirical research has been done on blended learning at global stage. Number of studies found its effectiveness and with the advancement of technology it will have greater impact on virtual learning.

There are few researches on blended learning in Bangladesh but there is no such study was found which aims to describe the using Moodle as a learning management system in Bangladesh. This study aims to find this gap and explore the practicality of this online system. As private universities in this country have flourished in giving quality education- they are working on using blended learning teaching and learning style- and this paper investigated this in a private university of Bangladesh.

Benefits of Using Moodle

Usability of Moodle: As Moodle is a new platform for the learners who have just started their graduation, it was quite time consuming for them to adapt with the new system. Although the scenario was different in two courses. While the students from Computer Science and Engineering have good command (78%) in using Moodle, the other students from Innovation and Entrepreneurship found it quite hard using Moodle (62%). The table 1 shows the usability of Moodle by the learners.

	Yes	Neutral	No
Login to Moodle was difficult	48.3%	5.5%	46.2%
Moodle features were flexible to use	61.6%	4.9%	33.5%
Attempting quizzes were hard	34.8%	9.3%	55.9%
Online assignment submission was easy	81.7%	10.5%	7.4%
Finding desired course was difficult	26.2%	22%	41.8%

Table 1: Usability of Moodle by the learners

Overall, it is found that login to the Moodle was quite challenging (48.3%) by the learners. They revealed the fact that the password system is a little confusing for them and sometimes they forget it because of various character system. Aside from it, the significant result is that the flexibility of using Moodle and its effectiveness. Learners reported that the features of this LMS is flexible (61.6%) and easy to understand. Then can even submit the assignments (81.7%) and quizzes (55.9%) easily in this online system. Moreover, they also said that it is not that much hard to find their desired courses in Moodle as all the courses are in the front page. So, flexibility of using Moodle is one of the key benefits.

Students' satisfaction, on the other hand, of the LMS was quite noteworthy. It is seen that this online system has satisfactory impression (87.8%) on the learners. They can find all the materials, resources, tools and activities at the same platform. It helped them to share their knowledge among other learners as well as teachers. Although some learners were not enthusiastic at the beginning of the courses (52%), they found it more effective when they started to using it by sitting at home. This is because they can find materials

even if they do not attend the classes. Moreover, teachers also motivate them to use this platform- said the students. However, as Google Classroom has been previously used by the teachers before introducing this platform to the students, learners perceived this learning management system (93.8%) more resourceful than Google Classroom. It is because there are hundreds of features integrated into this system. Before giving final examination, learners login to this system and download (95%) their necessary materials.

Interactions with teachers and students in blended learning is an integral part of education. Moodle also has this feature in the name of - Forum, Chat, Wiki, and Workshop. The most used interaction tool was forum (85.7%) as revealed by the students (figure 2). Teachers also like to use this activity in Moodle to give a platform to the students to interact as both teachers and students can see their activities and give their feedback on their learning. In Forum, students can easily post their learning problems and other students those who have the knowledge can give the solution immediately by replying. It helped them to gain necessary skills (83.6%) and interact with teachers (76.9%). Teachers also use this feature of Moodle (79.4%) if anything important to share with learners. Average number of students (39%) felt shy while talking in the physical class at the beginning of the semester. But they become very prompt at response (75.3%) in the online discussion. Not only that, it is observed, they are very good even in communication. When the online interaction was going smoothly for them, at the end of the semester, they have drastically improved. This indicates the usefulness of this Moodle.

Diversified Assessments were used during the courses. Learners were given different types of assessments after every classes (face-to-face and online). Such as- assignments, quizzes, making videos, peer discussion, review, playing games (using Kahoot) etc. This had a very powerful impact on students' learning outcomes. For English grammar courses, playing games after the lesson in face-to-face class brought a vibrant result. Most of the learners (84%) have enjoyed their class when this game was played. It is observed that, at the end of the class, when the lesson has been discussed, the students eagerly waits for the game to be played. That was quite effective and the result is saved in Moodle. The same outcomes go for the Fundamentals of Computer classes too (91%). On the other hand, availability of giving time frame in assignments and quizzes in Moodle make the assessments more viable. Students were required to submit their assignments and quizzes via Moodle within a given schedule. Around 79% students were able to submit it in due time. And 12.3% told that fluctuating of the internet availability at home was a crucial point for them not to submit their works. Those who submitted their works on time said that it helped them to study at home too and soft copy submission is easier than hard copy as it saves time and money.

In teaching, the teachers are required to document their teaching style for further use. Moodle is a great tool for them to keep their teaching resources at one platform. Teachers (88%) said that they are using Moodle to bring all the materials together for the students and track students' activities. Although the usage training on Moodle is required for the teachers. However, teachers' motivation plays a crucial part for the students. When a teacher encourages the students, they become very conscious but the vital factor is the marking system. Inclusion of marking into the activities make the learners motivated to login to the system (92.4%).

Conclusion

In pedagogy, it is very important to use blended learning at this present generation. For making any courses blended, it is necessary to introduce a learning management platform where all the materials can be uploaded along with necessary activities. Moodle has proved to be an effective tool to use in education at this study. Research has found that students have higher impact on their learning outcomes when the course is blended with LMS. Students' behavior is also significant in this study. If a student has positive outlook to adapt with new changes, s/he can easily grab the new learning environment. So, learning management system has powerful impact on students' learning at the tertiary level. Universities and other institutions of learning should continue to emphasize blended learning approaches through installation of learning management systems along with strong internet to enable effective learning through technology especially in the developing world (Kintu, Zhu and Kagamb2017e.). Flexibility is also and import factor of this LMS. This finding reinforces the pedagogical characteristics of blended learning as mentioned in existing literature, including the work of Graham (2006), Saltzberg and Polyson (1995), and Yen and Lee (2011). Besides this, this tool is not only a good for effective learning but also good for sharing knowledge and interaction. Moodle uses well known e-tools for communication (Kakasevski,



Mihajlov, Arsenovski, Chungurski, 2008). However, it is to be noted that diversified assessment tool in Moodle has significant result which encourage students' learning. When a lesson is blended with various assessments then it becomes an effective learning. Students also like this concept (81%) of getting resources beforehand and coming to the class with some knowledge. It helps in teaching too. So, the educational institutions which are moving towards blended learning can use Moodle as blended learning approach for its usefulness.

Commercial Value of Moodle

This Moodle is an open source software and any institution can easily download it in their server. If a course is properly organized, the course can be stored for further use in future. Diversified assessments in the course make the courses more interactive. These can be used as self-regulatory courses. Any institution can make their courses paid one for commercial purpose at the worldwide market.

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ID NO. IUM 002

TOPIC: BILINGUAL VIRTUAL TOOLKIT 'LET'S TwiST'

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Abstract: Tongue twisters are sequence of words, short phrases or short stories that repeat problem sounds or the same group of sounds to make them difficult to pronounce when saying them quickly. Tongue twisters are a fun way to help children improve their speaking skills and pronunciation. Realising this, a Bilingual Virtual Toolkit 'Let's TwiST', which is a dual language TwiST kit, is produced to help pupils, not only to practise their pronunciation in English and Malay Languages, but also to assist teachers and pupils in writing their own TwiSTs. This kit is user-friendly as anyone can utilise it in any language skill activities. The kit also provides the users with various types of sources for TwiST activities which includes the online and offline materials. Therefore, The Bilingual Virtual Toolkit 'Let's TwiST' will enable both teachers and pupils to create fun and interesting TwiSTs any time for varied language activities in an enjoyable, non-threatening and positive learning environment.

Key words: *Tongue twisters; speaking skills; pronunciation; fun; kit*

Introduction

The Bilingual Virtual Toolkit (BVT) 'Let's TwiST', which is a dual language TwiST kit, is produced to help pupils, not only to practise their pronunciation in English and Malay Languages, but also to assist teachers and pupils in writing their own TwiSTs. This kit is user-friendly as anyone can utilise it in any language skill activities. The kit also provides the users with various types of online and offline materials for TwiST activities. Therefore, BVT 'Let's TwiST' will enable both teachers and pupils to create fun and interesting TwiSTs any time for varied language activities in an enjoyable, non-threatening and positive learning environment.

Content

Tongue twisters are sequence of words, short phrases, short stories that repeat problem sounds or the same group of sounds to make them difficult to pronounce when you say them quickly (Albertson, 2017). The benefits of the use of BVT 'Let's TwiST' are improves one's speaking skills, helps in accurate pronunciation, assists in speaking clearly and with ease, can be used for all language skills and language components, suitable for all proficiency levels, increases one's confidence, learning takes place in a non-threatening environment, gives variety to teaching strategies and adds ideas as to how texts can be presented and used. Therefore, BVT 'Let's TwiST', provides different hands-on TwiSTs or is able to assist in writing one's very own TwiST from three different category of sources which are accessing online and offline materials and adopting or adapting online and offline materials as depicted in Diagram 1.

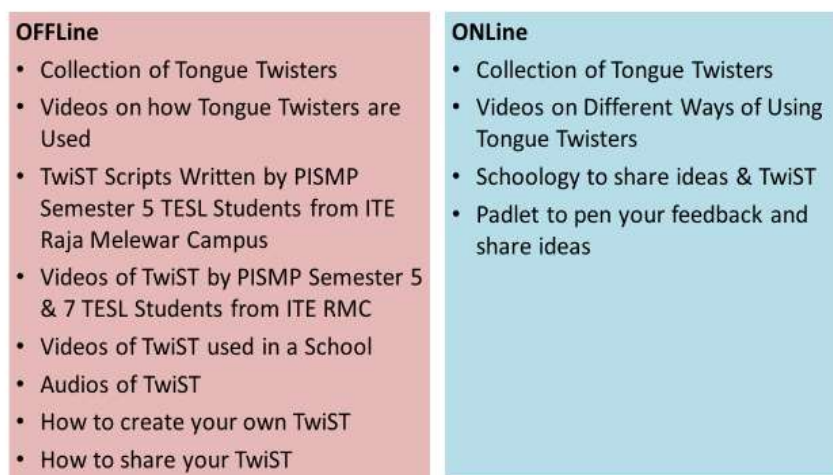


Diagram 1 : Tools used to form The Bilingual Virtual Toolkit 'Let's TwiST'

Most actors, politicians and motivational speakers use tongue twisters as a warm up exercise for the muscles in their mouth, enabling clearer pronunciation, overall clearer speech patterns, and an easier time pronouncing previously difficult syllables. Children can use tongue twisters as a learning exercise too. The tongue twister should be spoken slowly, in order to give the child time to speak it correctly with accurate pronunciation and articulation (Celce-Murcia, Brinton and Goodwin, 1996). After that, the rapidity can be increased until the child is able to say the tongue twister at various speeds without 'tripping' up their tongue. A 2012 study from China found that just one week of speech therapy can help reorganise brain connectivity and reduce stuttering and other speech related issues. Prosic-Santovac (2009) said that we should not automatically exclude tongue twisters from our classes because without risks and mistakes we could not learn anything. Therefore, with BVT 'Let's TwiST', learners and educators alike can be challenged both physically and mentally.

A study on the benefits of BVT 'Let's TwiST' was carried out on TESL semester 5 (2014 intake) and TESL semester 4 (2016 intake) undergraduates from Institute of Teacher Education Raja Melewar Campus, Seremban (ITE RMC) as well as in both primary and secondary schools namely SKTSP, a primary school in Senawang, Seremban, Negeri Sembilan involving Year 3 pupils, Year 1 pupils from SKSP, Seremban, Negeri Sembilan, Year 3 pupils from SKKGV, Seremban, Negeri Sembilan, Year 3 pupils from SKCJ, Cheras, Selangor, Year 2 pupils, SKB (1), Kuala Lumpur and Secondary 4 and 5 students from SMPKV, Shah Alam, Selangor. Before using BVT 'Let's TwiST', the teachers noticed that pupils had difficulties in word and phrase pronunciations especially involving similar consonants and consonant clusters. Apart from pronunciation, the pupils also demonstrated difficulties in using the correct intonation and lacked fluency when speaking.

The positive results after the use of BVT 'Let's TwiST', which has materials suitable for any TwiST activity in and outside a classroom, are as follows:

- i. 90% of the pupils were able to pronounce words, phrases and sentences correctly with minimal errors;
- ii. the teachers also noticed that the pupils were able to speak and use phrases and sentences using correct intonation, although they were asked to speak fast;
- iii. Teacher 1's Year 3 pupils loved the TwiST activity carried out (Nurul Huda, whatsapped message, November 23, 2017);
- iv. Teacher 2's Year 2 pupils wanted more TwiST activities in the classroom as they had fun with TwiST (Varshini, whatsapped message, March 3, 2018) ;
- v. teachers in Teacher 2's school were interested in using TwiSTs for upper primary classes (Varshini, whatsapped message, March 3, 2018);
- vi. positive feedback was given by all undergraduates who had created their own TwiSTs and shared them via Schoology
- vii. all TESL undergraduates said they learned from each other when they shared their TwiSTs via Schoology

Furthermore, teachers and future teachers as well as their learners did become more creative in their classrooms after the use of BVT 'Let's TwiST'. Gan (March 3, 2018) wrote in her schoology post, 'I was inspired by the ideas and creativity which could help me in my upcoming practicum'

BVT 'Let's TwiST' can be utilised by not only undergraduates, educators and teachers, but also anyone who is interested with ideas to create fun, active learning texts to be used in their classes/halls regardless of group size, proficiency levels, language skills and for a variety of topics.

Finally, BVT 'Let's TwiST' can be commercialised as this kit has been converted into a compact disk (offline) and as an application of software (online).

Acknowledgement

We would like to express our heartfelt thanks and appreciation to the Director and Deputy Director of ITE RMC, Seremban, the organisers of IUCEL, TESL (2014 intake) and TESL (2016 intake) undergraduates from ITE RMC, Seremban and Ms. Varshini, a graduate from ITE RMC (and her pupils from SKB(1), Selangor) and Ms. Nurul Huda, another graduate from ITE RMC (and her pupils from SKCJ, Kuala Lumpur). We are also grateful for the cooperation and support given by principals, teachers and pupils in SKTSP, Senawang, Negeri Sembilan, SKSP, Seremban, Negeri Sembilan, SK KGV, Seremban, Negeri Sembilan, SKCJ, Cheras, SKB(1), Kuala Lumpur and SMPKV, Shah Alam, Selangor, for the cooperation given throughout the study and all those who have contributed to the success of BVT 'Let's TwiST'.

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ID NO. IUM 004
TOPIC: ONLINE CLASSROOM LOUNGE

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Abstract

Classrooms nowadays have gone beyond the physical walls in which internet connectivity was used for teaching and learning purposes. One of many ways is Online Classroom (OC) which means synchronous instructor-dependent classroom hours, conducted online. Lecturers have been conducting Online Classroom independently for many purposes such as replacing classes and integrating blended learning techniques. However, without a standard guideline, lecturers are open to risk of malpractice when conducting OC. A committee was formed to conduct a pilot test on OC in order to collect feedback from lecturers and students. This feedback was then used to establish standard guidelines for lecturers in conducting OC. A platform is then needed to house this guideline and connect lecturers to share and improve their OC practices. Therefore, the Online Classroom Lounge (OCL) is created as a web platform allowing lecturers to share their OC pedagogies. This platform also allows lecturers and students to provide feedback on these pedagogies in order to minimize the risks before implementation of OC. The contents of the OCL include: A page (OC guidelines) containing standard guideline to implement OC; a second page (OC forum) showcasing OC pedagogies shared by lecturers and students with likes and comments section; and a third page (open lounge) is an open platform for students and lecturers to discuss other OC-related matters. The OCL is focused to cater the needs of the Centre for Foundation Studies community. As compared to i-Hikmah (a portal of Community of Practice for IIUM), the OCL has the value-added features such as 'Like' function, public access without the need to login in from IIUM, and faster access to OC-related discussion.

Key words: *online classroom; blended-learning technique; web-sharing platform*

1. BACKGROUND

It has been customary for teachers and lecturers to conduct the replacement class in a physical classroom. The difficulty of conducting replacement class increases according to the number of students in the class. The larger the class, the harder it is to find suitable class and time to make it an interactive teaching and learning experience. Often happens, lecturers unable to optimize their teaching due to such difficulties.

A discussion on teaching pedagogies among lecturers of CFS IIUM has resulted the idea of OC. At first, the idea of OC was practiced in many forms and open to risks of malpractice such as providing misleading content for the topics, difficulty to control the focus of discussions, tendency for lecturers not fully prepared for their OC and harder to identify and anticipate students' attendance and participation.



Upon identifying the problems, Online Classroom Pilot Committees (OCPC) was formed to conduct a pilot test on OC and design Standard Guidelines for lecturers to improve their OC practices. Series of discussions were conducted and the OCPC has identified problems from the first test and suggested a standard teaching guideline and a platform for OC.

Based on the guidelines, OCL is created as a platform for lecturers to share their pedagogies with other lecturers and students, not limited to specified time and place. This also allows students to access OCL using their own devices to achieve goals set by their teachers and become more independent learners.

2. ONLINE CLASSROOM LOUNGE (OCL)

Online Classroom Lounge (OCL) is a web platform allowing lecturers to share their Online Classroom (OC) pedagogies. This platform allows lecturers and students to provide feedback on these pedagogies in order to minimise the risks before implementation of OC.

The contents of the OCL include: A page containing standard guideline to implement OC; a second page showcasing OC pedagogies shared by lecturers with likes and comments section; and a third page for an open online lounge to discuss other OC-related matters.

The first page contains an OC infographic on research-based guidelines in OC implementation. This page showcases the stages of preparation, commencement and review of OC. The preparation stage consists of steps to acquire, bind, and communicate OC pedagogies, while the commencement stage involves measures to motivate, mobilise, and modify the pedagogies, and finally the review stage includes initiatives to reflect, suggest, and transform these pedagogies to the improved ones.

This page also contains guidelines on the do's and don'ts to implement OC. These include the challenges perceived by both students and lecturers while implementing OC. These challenges were followed by suggestions on how to further improve OC experience.

The second page of the web platform contains OC forums that provide sharing facility of OC pedagogies by either lecturers or students. It also contains ideas and experiences shared by them specifically about each OC tools. The posts in this page are organised based on courses offered by academic departments. Likes and comment section is available to display the feedback and preferences to OC pedagogies or tools that are posted in this page.

The third page of this web provides an open lounge that allows the public to share their thoughts, comments, suggestions, or concerns regarding OC matters. Likes and comment section that allows the use of voice recording is available for all users to give feedbacks. OCL users can also ask questions in this page in order to get clarifications and assistance on OC implementation from other users of OC or OCL.

Frequently Asked Questions (FAQ) are provided in page 4 for the convenience of all OCL users. This page addresses common questions that newbies in OC might have on the ideas and implementations of OC.

Page 5 contains brief background and description of the team of innovators.

The last page contains list of registered members of OCL which may include the innovators and the publics. Members could log in or new member can sign up using Facebook or Google+ email account.

3. IMPORTANCE OF OCL TO EDUCATION

The Malaysia Education Blueprint 2015-2025 for Higher Education (MEB-HE) has outlined the 10 Shifts towards a sustainable educational development. The OCL relates with at least three (3) if not more, of the 10 shifts mentioned in the MEB-HE: (3) Nation of Lifelong Learners; (7) Innovation Ecosystem and; (9) Globalized Online Learning.

3.1 OCL encourages lifelong learning among teachers and students

The government strives for developing "...learning communities in every organization, with formal mechanism to recognize prior learning experience and learning." (Ministry of Education Malaysia (2015, p.17). OCL is a web-sharing platform in which it helps the community of lecturers and students share and exchange knowledge with each other in which this is the element of developing learning communities. In addition to that, OCL provides opportunities for sharing teaching practices and recorded feedback as a mechanism to recognize teaching abilities of one another.

3.2 OCL serves as a planting soil for innovation

One of the plan in the 7th Shift (Innovation Ecosystem) in the MEB-HL is give incentives to Higher Learning Institutions to establish support systems for the commercialization of ideas (Ministry of Education Malaysia, 2015). The OCL is a platform which enhance data management in which it is a platform which gathers specified information regarding the teaching and learning practices on Online Classroom. OCL also serves as a support system for talent development as the web-sharing platform enables teachers and students to share online classroom pedagogies to be reviewed and improved. Innovative teaching and learning practices may start to develop in OCL.

3.3 OCL contributes to the continuous development towards globalized Online Learning

With shared feedbacks in OCL by fellow lecturers and students regarding the pedagogies for online classroom, suggestions for the improvement of cyber-infrastructure may emerge. This then gives ideas to how a Higher Learning Institution to further improve its cyber-facilities which, is a requirement of advancing towards a globalized Online Learning environment. The interaction of lecturers and students would also help gauge the academic capabilities in conducting online classrooms. This then brings better generation of ideas for the improvement of cyber infrastructure.

4. ADVANTAGES

As learning is taken online, there are opportunities to improve the learning experience (Sharples, et al., 2014). Due to that, the OCL is created and has the following advantages:

- Expand the social network for the sharing of OC practices as all students and lecturers worldwide can gather virtually and share the OC pedagogies and related ideas.
- Ability to conveniently review the shared OC pedagogies as the OC pedagogies can be assessed online through electronic devices.
- Suggest the most feasible OC pedagogies to emphasise its future use through likes and comments by lecturers and students.
- Empowering non-educators in the design of teaching and learning experience. The OCL can spark public interest to involve in the development of OC.

5. COMMERCIAL VALUE

The use of online communication with teaching experts is a promising way of implementing e-learning in the context of initial teacher training (Kupetz & Ziegenmeyer, 2006). Due to that, this platform fosters the offering of training package based on collaborated expert reviews from various institutions. This platform is useful in the training industry (academic and corporate). This platform can be offered to hire trainers between members of multiple institution of learning. OC pedagogy reviewer can be recruited therefore, expanding job opportunities for lecturers and students alike. The OCL will increase exposure for talented



lecturers and teachers in the corporate or private educational sector. Additionally, it gives an opportunity for trainers to share and test their training methods with academic monitoring and public opinion.

Acknowledgement

We would like to thank the Dean of CFS, Assoc. Prof. Dr. Mohamad Haniki bin Nik Mohamed, other OC Pilot Study Committee members, and students involved in the project.

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ID NO. IIUM 006	TOPIC: MOBILE APP GLOSSARY OF TERMS IN ISLAMIC BANKING AND FINANCE (ARABIC-MALAY- ENGLISH) VIA IOS & ANDROID BASED DEVICES

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Abstract: Newer development in mobile technology allows the use of hand phone which can be extended not only to communication but also to other personal life styles such as digital references in a form of dictionary or encyclopaedia, to the users for *just in time*, *just enough*, and *just for me* access of information. One of the areas that received vast attention nowadays by educationists and learners alike is the area of Islamic banking and finance. The expansion of Islamic banking practices through various local financial institutions leads to the need in understanding the terminologies used in the industry in “just-in-time” manner due to the dynamism of the field itself. In view of this scenario, the present research seeks to shed some light using a workable model for developing a purposeful mobile Islamic banking terminology glossary app in a more convenient way and made it operational via devices such as iPhone, iPad or any Android-based smart gadgets. It further explored the prototype development and its implementations for mobile accessibility by providing multilingual glossary of Islamic banking and finance terminologies (Malay-Arabic-English). The translation of specific terms from any academic field needs collaboration between experts both from the language and subject domains. This paper reports the findings of the need analysis stage, inclusive of mapping users' device type, Internet accessibility, reasons for owning mobile devices, delivery and user interface, and preferred features to be embedded in the mobile app.

Keywords: mobile app, mobile learning, Islamic Banking, Islamic Finance, instructional design model

Introduction

The expansion of Islamic banking practices through various local financial institutions leads to the need in understanding the terminologies used in the industry in “just-in-time” manner due to the dynamism of the field itself. In view of this scenario, the present research seeks to shed some light using a workable model for developing a purposeful mobile Islamic banking terminology glossary app in a more convenient way and made it operational via devices such as iPhone, iPad or any Android-based smart gadgets. It further explored the prototype development and its implementations for mobile accessibility by providing multilingual glossary of Islamic banking and finance terminologies (Malay-Arabic-English).

Design and Development Process

The design and development of mobile app glossary of terms in Islamic banking and finance (Arabic-Malay-English) via iOS and Android based devices was implemented fundamentally through Rapid Prototyping ID model. The initial phase started with the need analysis stage, inclusive of mapping users' device type, Internet accessibility, reasons for owning mobile devices, delivery and user interface, and preferred features to be embedded in the mobile app.

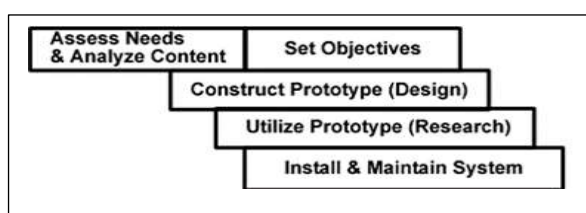


Figure 1: Rapid Prototyping Model

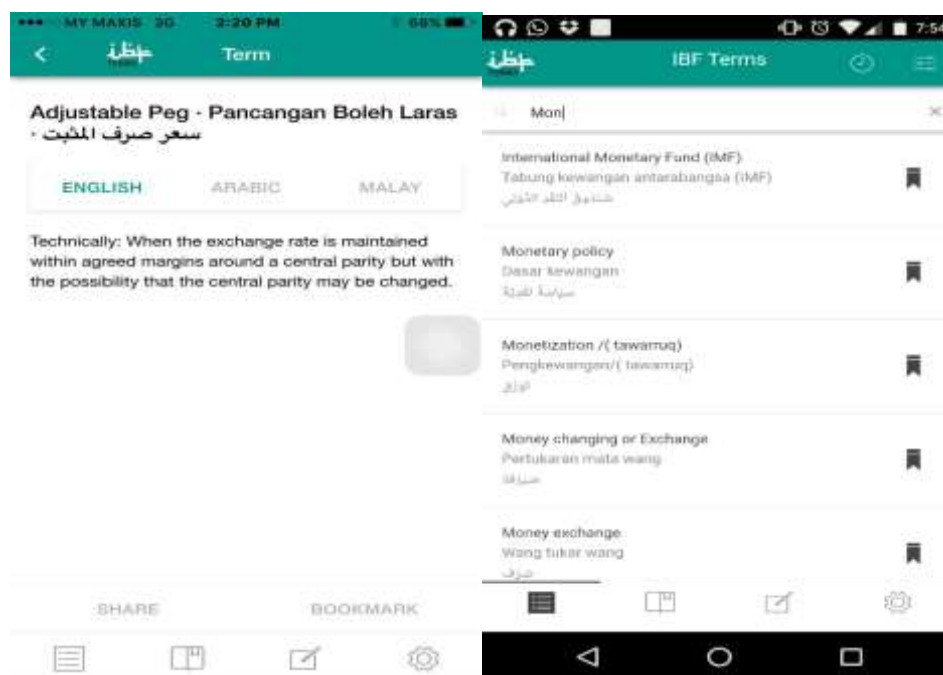
Commercial Potentials

- IBF Terms is the first trilingual mobile dictionary app (Arabic-Malay-English) which was inspired in view of its importance towards the development of IBF (Islamic Banking & Finance) industry in the world at large.
- This mobile provides an immediate mean for IBF practitioners, academicians and students to make use of their mobile phones to explore, learn and understand IBF terms in depth, inclusive of its principles, techniques and applications.
- The app is expected to benefit those (both Muslims and non-Muslims) who are interested in knowing the approaches of Islam in establishing and managing banks and financial institutions.

Novelties

- Research output of PRGS 2014-2016 by MoHE.
- A continuation of printed version on IBF dictionary
- Inter-disciplinary collaboration between various experts in Arabic language studies, Islamic studies & Islamic banking and finance

Product Interface



Conclusion

This paper presented has discussed the design of a mobile prototype app which enables users to look for Malay-Arabic-English terms in Islamic banking and finance via mobile access and interface. The users' needs and preferences are being taken account during the development of the mobile app. The app could be utilised to engage users in improving their knowledge on Islamic banking and finance. This is because not only the integrated features are those preferred and suggested by them but the overall interface itself that makes it likely unique from any other mobile apps available in the field. Hopefully it would contribute to a significant input in disseminating the intended information not only in an efficient and effective way but also engaging and enjoyable to the users.

Achievement and Publication

1- Mohd Ghalib, Mohd Feham and Mansor, Yushiana and Dollah, Nafi@Hanafi and Hassan, Rusni and Omar, Zakaria and Zakaria, Abdul Wahab (2015). Providing a mobile service for academics



and professionals: need analysis for the development of mobile app glossary of terms in Islamic banking and finance. In: The 5th International Conference on e-Learning (ICeL 2015), 26th - 28th MAY 2015, Hyatt Regency Kinabalu, Kota Kinabalu Sabah, MALAYSIA.

2- Mohd Feham Md. Ghalib, Yushiana Mansor, Nafi @ Hanafi Dollah, Rusni Hassan, Zakaria Omar, Abdul Wahab Zakaria (2016) Providing a Mobile Service for Academics and Professionals: Need Analysis for the Development of Mobile App Glossary of Terms in Islamic Banking and Finance. In: Envisioning the Future of Online Learning. Springer, Singapore. ISBN 978-981-10-0952-5

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4- Nafi, Dolah et. al. (2017). Prototype Development of Mobile App for Trilingual Islamic Banking and Finance Glossary of Terms via IOS and Android Based Devices. *International Journal of Interactive Mobile Technologies (IJIM)*. ISSN: 1865-7923 – SCOPUS indexed.

5- Patent Application (PTSR100493) from TRADEMARK2U SDN BHD (670910-M) through Research Management Centre (RMC), IIUM.

6- Gold Medal, International exposition on Shariah Compliant Idea, Invention, Innovation and Design (ISCIIID) 2016, UiTM Shah Alam, 21-22 November 2016.

7- Bronze Medal, Malaysia Technology Expo - MTE 2017. 16-18 February 2017, PWTC, Kuala Lumpur.

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ID NO. IIUM 007	TOPIC: E-Diwan Ingenious Mobile Interactive Arabic Language Education Tool

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Highlights:

Arabic language is a global language and has become one of the most important languages for all language learners around the world. A fundamental component of sound Arabic language acquisition is Arabic poetry which is innately intricate. Hence, deficiency in interactive computer programs specially designed for learning Arabic poetry, has generated apathy that Arabic poetry is superfluous, consequently ensuing impotence to the graduates of Arabic Language and Literature Studies. The existing scenario illustrates the preference and reliance on interactive programs and gadgets among the educators and students. *E-Diwan* enables the accessibility of teaching and learning Arabic poetry through a mobile device and a mobile interface (Android, iPhone, Windows Mobile) with a designated Arabic poetry electronic portfolio website. *E-Diwan* keeps the students glued to the screen and are dazzled by the aesthetic beauty of Arabic poetry subsequently augmenting them with a corpus of Arabic literary lexis. By a click of a button, the app displays a spectrum analysis of the poems; definition, grammatical and rhetorical properties, a brief biography of the poet, and translation of the poems in English and Malay. It is also equipped with the ability to audio present the above information using a recorded voice of an Arabic native speaker. Built-in are videos designed to simultaneously improve the information outcome and performance skills of the user. *E-Diwan's* comprehensive nature facilitates individual learning, which cultivates Life Long Learning. *E-Diwan* fits as a lecture companion tool for all educators teaching Arabic poetry and Arabic language learners.

Key words:

E-Diwan App. Arabic Poetry. Interactive Program. Lecture Companion Tool. Life Long Learning.

Introduction

A fundamental component of sound Arabic language acquisition is Arabic poetry which is innately intricate. Hence, the lack of methodology in teaching Arabic Poetry, i.e. deficiency in interactive computer programs specially designed for learning Arabic poetry, has generated apathy that Arabic poetry is superfluous, consequently ensuing impotence to the graduates of Arabic Language and Literature Studies.

The problem of this innovation lies in the lack of the interactive aspect in computer programs that are specially designed for learning Arabic poetry for non-native learners. This is because these programs simply put phonetic samples that require the learner to just imitate until he gets used to the correct pronunciation. Indeed, these programs are designed based on a false assumption that the learner can distinguish between what's correct and what's not. While in reality if he can distinguish he would not need such programs. Therefore, we need to design an interactive program that not only presents information on the poem chosen in a simplified and pragmatic manner but also enhances the enthusiasm of the learner.

Realizing the need to have an interactive program to teach Arabic poetry would be a main motivating factor behind the E-Diwan project. The existing scenario illustrates the preference and reliance on interactive programs and gadgets among the educators and students. Therefore, this programme aims to increase the means of accessibility via mobile so that the learning process can be made "Just in time, Just enough and Just for me".

In summary the problem statement is as follows:

1. Learning engagement problems.
2. There is no proper methodology to engage student in learning and deep understanding of poetry.
3. Lack of tools to enhance student experience in appreciating and applying poetry to enrich their Arabic vocabulary.

Therefore, E-Diwan is designed to take the teaching of Arabic poetry to another level. A level which will keep the students glued to the screen and be dazzled by the aesthetic beauty of Arabic poetry subsequently augmenting them with a corpus of Arabic literary lexis. By a click of a button, the app will display a square window containing the spectrum analysis of the poems and the phonetic characteristics; definition, grammatical and rhetorical properties and a brief biography of the poet. It is equipped with the ability to audio present the above information using a recorded voice of an Arabic native speaker. Built-in are countless sets of interactive exercises, designed to simultaneously improve the information outcome and performance skills of the user.

The E-Diwan project applies a developmental research design using rapid prototype instructional design as a workable model entailing the following:

- Assess needs and content – analyzing the needs of the development and the nature of the content in detail.
- Design – constructing a prototype for the project through design, programming, testing, debugging, sketching storyboards and designing accurate user interface.
- Research – utilizing the prototype and performing continuous evaluation.
- System installation- installing the prototype with the required applications and specifications enabling it to be displayed in mobile stores for commercial purposes.

The output of this research is a 1st Comprehensive Android and an IOS Based Interactive E-Text Book of Arabic Poetry for Non-Native Speakers. It is an app for Arabic poetry accessible through mobile device and a mobile interface (Android, I-Phone, Windows Mobile) for a designated Arabic poetry electronic portfolio website. It is an enhancement of the output of our previous FRGS (2008- 2011). In our FRGS, we developed a Teaching Kit to teach Classical Arabic Poetry, comprising of a text book and a DVD IJUM. The above initiative is timely considering the current scenario illustrates the preference and reliance on interactive programs and gadgets among the educators and students. It is also in line with The Internet of Things (IOT), which is a major aspect of the 4.0 IR in Education.

The App displays the speaking device of human being with the Arabic letters and phonemes distributed on it. By clicking on any word in a poem, the program will not only show all the phonetic characteristics of the word whether the characteristics are corollary temporary or original, but at the click of a button, a text appears in a square window containing all the information of that poem and the correct pronunciation in addition to showing the spectrum analysis of the poems with the ability to audio present this information using a reformed robotic voice or a recorded human voice. The program also provides the user with countless sets of interactive exercises that help to improve the information outcome and the performance skills at the same time.

The comprehensive nature of this application enables the users to conduct individual learning hence it would cultivate Life Long Learning. In addition, this application serves as a method of knowledge and

culture preservation and dissemination of the rich knowledge and civilization of Arabic poetry. This method of preservation and dissemination of knowledge solicits future generations to trace the roots and cultural origins of Arabic civilization.

In addition to the above, the methodology applied in this application can later be adopted and adapted into the learning of poetry in other languages with similar structures, i.e. Urdu and Persian.

For commercialization purposes, the App is made in two phases. The first phase is made free and accessible to all users, and the second phase with a considerable amount of subscription fee. Collaborations with similar target markets software providers on Play store and App store for symbiotic advertisement and marketing as well as in-app purchasers have been carried out. The application currently has been translated into Malay and English to cater for the needs of 'Arabic poetry enthusiast' among non-native speakers. This will ultimately widen the market of potential users and customers of the product.

Content

Please address as many of the following sections as possible in your paper, as relevant.

1. Description of innovation / product development / design / process.

This E-Diwan App aims to increase the means of accessibility via mobile so that the learning process can be made "Just in time, Just enough and Just for me". E-Diwan enables the accessibility of teaching and learning Arabic poetry through a mobile device and a mobile interface (Android, iPhone, Windows Mobile) with a designated Arabic poetry electronic portfolio website. E-Diwan keeps the students glued to the screen and are dazzled by the aesthetic beauty of Arabic poetry subsequently augmenting them with a corpus of Arabic literary lexis. By a click of a button, the app displays a spectrum analysis of the poems; definition, grammatical and rhetorical properties, a brief biography of the poet, and translation of the poems in English and Malay. It is also equipped with the ability to audio present the above information using a recorded voice of an Arabic native speaker. Built-in are videos designed to simultaneously improve the information outcome and performance skills of the user. E-Diwan's comprehensive nature facilitates individual learning, which cultivates Life Long Learning. E-Diwan fits as a lecture companion tool for all educators teaching Arabic poetry and Arabic language learners.

The E-Diwan project applies a developmental research design using rapid prototype instructional design as a workable model entailing the following:

- Assess needs and content – analyzing the needs of the development and the nature of the content in detail.
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Intellectual property registered:

1. LY2017005090=E-Diwan
2. LY2017005823=Mugtatafat Min Al Sy'ir Al Jahili-Audio-Visual Materials-CD
3. LY2017005828=A New Method for Teaching Classical Arabic Poetry to Non-Native Speakers
4. LY2017005830=Mugtatafat Min Al Sy'ir Al Jahili

2. Context or background of the innovation / product development / design / process.

Arabic language is a global language and has become one of the most important languages for all language learners around the world. A fundamental component of sound Arabic language acquisition is Arabic poetry which is innately intricate. Hence, the lack of methodology in teaching Arabic Poetry, i.e. deficiency in interactive computer programs specially designed for learning Arabic poetry, has generated apathy that Arabic poetry is superfluous, consequently ensuing impotence to the graduates of Arabic Language and Literature Studies. Realizing the need to have an interactive program to teach Arabic poetry is the main motivating factor behind this project., and with the development (Internet of Things) IoT software application developed specifically for use on small, wireless computing devices, such as smartphones and tablets more interactive language education tool is possible. Furthermore, the existing scenario illustrates the preference and reliance on interactive programs and gadgets among the educators and students. With this in mind, this programme aims to increase the means of accessibility via mobile so that the learning process can be made "Just in time, Just enough and Just for me".

3. The Importance to education

In our experience of teaching Arabic poetry, i.e; classical to Malaysian and non-native speakers of Arabic, we have found a lack in the methodology of teaching Arabic Poetry. This has brought about a fear of people in general and students in particular divilging themselves in Arabic literature generally and poetry specifically. As this is a fundamental component both of literature as well as sound language aquisition it has become a major handicap to the quality of product from Malaysia in general and IIUM specifically. In our experience this issue seems to carry over to other Asean countries as well who's students have not studied in a Arab country. It is therefore a requirement to re-assess, re-evaluate, re-analyse and reformulate the methods employed as well as the texts used in empowering the students with these fundamental skills. The end result being a holistic, attractive, simplified method and text easily understood by non-native speakers of Arabic.

Poetry has been used in many forms in the teaching of Arabic language. It has been highlighted as being the link to fill the cultural void in teaching language. Learners thus experience the culture of the language and therefore relate to the language much more than just memorizing vocabulary, syntax and grammatical rules (Shanahan, D., 1987). Literature in general has also been discussed in the context of developing critical, analytical skills in the foreign learner of a language (Schultz, J. M., 1995, 1996). It is however complex for second and foreign learners of that language. It therefore requires specific tools i.e. language tools geared to the literature context in order to facilitate the grasping of a literary work (Bernhardt, E.B.,1995).

The learning and teaching of literature also has its specific inherent problems which are not covered in that of linguistics teaching. A specific problem based theory which can discuss these issues to bridge the gap in literary understanding is a necessity (Cipolla, W. F., 1987). Thus in the teaching of literature it is optimum to have a preparatory phase which provides linguistic activities and establishes comprehension. An interpretive phase includes expression and exchange of student reactions and a synthesis phase provides for an overall evaluation of the text (Harper, S. N., 1988).

It is with the above in mind that this study concentrates on formulating the tools necessary for these skills to be acquired, tailor made for the Malaysian student studying Arabic poetry, thus increasing their analytical ability in the Arabic language. The presentation of this in E-Diwan as an Interactive Arabic language education tool is to promote motivation and take the monotony out of the memorization text based context (LeLoup, J.W. & Ponterio, R., 1998). This will also encourage independence and instill a level of confidence to take the challenge of Arabic literature.

4. Advantages of innovation / product development / design / process towards education and community.

E-Diwan takes the teaching of Arabic poetry to another level. A level which will keep the students glued to the screen and be dazzled by the atheistic beauty of Arabic poetry subsequently augmenting them with a corpus of Arabic literary lexis. By a click of a button, the app will display a square window containing the spectrum analysis of the poems and the phonetic characteristics; definition, grammatical and rhetorical properties, a brief biography of the poet, and translation of the poems in English and Malay. It is also equipped with the ability to audio present the above information using a recorded voice of an Arabic native speaker.

Built-in are countless sets of interactive exercises including videos, designed to simultaneously improve the information outcome and performance skills of the user. The comprehensive nature of E-Diwan enables the users to conduct individual learning, which cultivates Life Long Learning. E-Diwan fits as a lecture companion tool for all educators teaching Arabic poetry and Arabic language learners. E-Diwan could be used effectively to enhance learning performance and captivate the readers' attention and enthusiasm, providing them with a satisfactory and engaging experience. It serves as a method of knowledge and culture preservation and dissemination of the rich knowledge and civilization of Arabic poetry. This method of preservation and dissemination of knowledge solicits future generations to trace the roots and cultural origins of Arabic civilization. The methodology applied in E-Diwan can be later be adopted and adapted into the learning of poetry in other languages with similar structures, i.e. Urdu and Persian.

5. Commercial value in terms of marketability or profitability of your innovation / product development / design / process .

The commercial potential of E-Diwan is promising. Institutions worldwide which teaches Arabic poetry will benefit from the program. E-Diwan is currently used at IIUM in Arabic poetry classes. Locally, in Malaysia E-Diwan has big potential among students from the public and the private universities as well as high school students who are majoring in Arabic Studies. To date, the approach to teaching Arabic poetry has not evolved from the traditional method. Hence, E-Diwan could definitely be made commercial and would give a profitable return to the institution if it is being widely used and applied among the students as well as the lecturers. With the IoT preference and the increasing rapid preference for electronic devices, E-Diwan accommodates the usage of mobile devices (Iphone, Ipad, Ipod, and Android based Smartphones), making the journey to venture in this area an endless sea of opportunities and possibilities. The application could be used effectively to enhance learning performance and captivate the readers' attention and enthusiasm, providing them with a satisfactory and engaging experience. The methodology applied in this application can be later be adopted and adapted into the learning of poetry in other languages with similar structures, i.e. Urdu and Persian.

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ID NO. IUM 008

TOPIC: MYRAFF 2.0: ARABIC EDUCATIONAL E-GAMES

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Abstract:

Learning Arabic as a foreign language requires a lot of continuous practice and memorization. Teachers who are teaching Arabic for non-native speakers usually will provide students with numerous exercises and notes to ensure that students will continually engage themselves with the subject at home. Previously, these exercises and notes were delivered in the form of photocopied version. Nonetheless, teachers have now started to digitalise their notes and exercises. While this new improvement is more interesting and engaging, it requires more preparation time. The teachers also need to have some basic IT skills and adapt to the rapid changes in technology which can be tedious to some. MyRaff 2.0 is one of the platforms that offers a solution to this problem. This invention offers a collection of Arabic educational e-games created using PowerPoint Visual Basic for Application (VBA) code, triggers and advanced animation. The games offered vary from simple card games to complex crime solving games. All games are creatively designed to make players learn Arabic in a fun and enjoyable way.

Key words: *learning Arabic language, educational, e-games, PowerPoint, non-native speakers*

Content

Introduction:

MyRaff 2.0 is a collection of Arabic educational e-games which was created using PowerPoint, based on popular apps games and tv show games. It is a language learning platform distinguished behind an exciting game that can be used by teachers as an activity in class or accessed by students at home. The games offered are creatively designed to suit students from elementary level to advanced level.

Objectives & Problem Statement:

The purpose of this project is mainly to help teachers who are looking for new activities to teach Arabic language in class. It also aims to help learners who are trying to boost their Arabic language vocabulary. There are many ways to learn Arabic language, however, most people agree that playing games is definitely by far one of the best ways to learn a new language. Learning through games is easy, fun and helpful to build Arabic language vocabulary faster without using those boring books and mind-numbing tests that typical classes come with. Unfortunately, creating these games especially the online games required skills that not all people equipped with it. As such, most of the teachers and learners will search for the language games available online. However, most of these games are stereotype, need to be paid for and only focus on elementary level. MyRaff 2.0 offers a solution for this problem. The games offered in MyRaff 2.0 are creatively designed to be adventurous, challenging and exciting. It can be downloaded for free and the contents are categorized according to their proficiency levels.

Methodology:

Vocabularies used in the games are carefully selected and categorized based on the students' need analysis. Games are created using PowerPoint Visual Basic for Application (VBA) code, triggers and advanced animation.

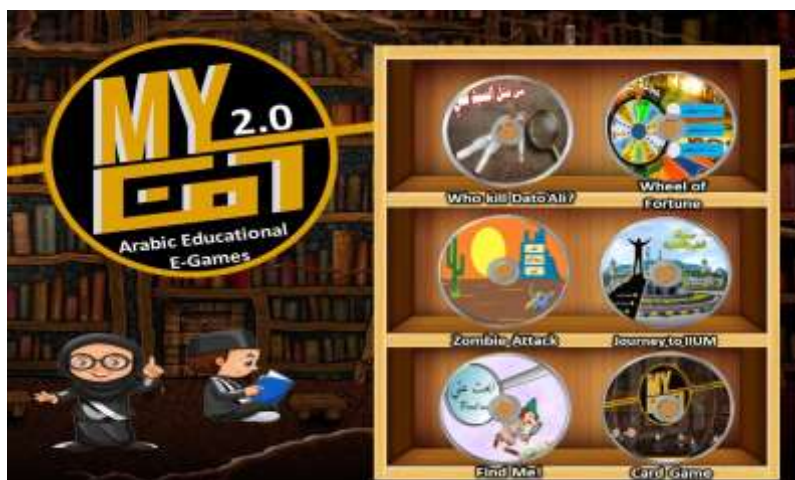
Impact to the Education & Community:

This project has a high impact to Arabic language education. It helps to bring up Arabic language studies to the next level in a fun and an enjoyable way. Playing games offered by MyRaff 2.0 will help players to learn Arabic vocabularies and retain information faster. MyRaff 2.0 will erase the common labelling that learning Arabic language is difficult and boring, instead it will stimulate interest in learning Arabic. MyRaff 2.0 also helps to promote the other use of PowerPoint which most people do not aware of. Creating games using PowerPoint is totally costless and free to use, as such it is an excellent choice for those with a budget constraint.

Commercialization potential:

The games available in MyRaff 2.0 can be commercialized separately and have a great potential to be upgraded into mobile game app. The target group of users are teachers and students in schools and higher learning institutions as well as all Arabic language lovers.

An insight of the project:





Award & Paper:

Award:

Bronze Medal, MyRaff: Arabic Card Game, Innovation in Teaching and Learning of Arabic Language Competition, World Arabic Language Day, UKM, 17 & 18 December 2017.

Conference paper:

- Keberkesanan Power Point, Gambar dan kad imbasan dalam pengajaran dan pembelajaran Bahasa Arab J-Qaf, Persidangan Antarabangsa Bahasa Arab 2016, UM, 22 October 2016.

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ID NO. IIUM 009

i-Saraf – A Web-based Multimedia Platform for Learning Arabic Morphology

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Abstract: Saraf or Morphology is one of the branches of knowledge in Arabic Linguistic. Towards Technology 4.0 or known as Fourth Industrial Revolutions, the Internet of Things, the researcher believes that, learning Arabic morphology through the design of a computer assisted program by using multimedia via the World Wide Web would greatly help student in learning Arabic Morphology. Knowing that there are many students from Arabic language especially non-native speakers faced difficulties in learning Arab morphology, including the large number of morphological terms that lead to student

psychological disorder, distraction of mind, and it becomes worst if they are presented with the views of scholar's different views which lead them to avoid morphology subject due to its complexity and difficulty material based on learners' perception. This study adopted two methodologies of descriptive and analytical. After collected information about the difficulties in learning Arabic morphology, theories of learning Arabic language via the World Wide Web, the researcher designed a computer assisted program by using multimedia via the URL of <http://efolio.iium.edu.my/courses/sorof/index.html> through the website of Blendspace. It was developed in the light of instructional design model of ADDIE based on the views of the respondents and their suggestions and needs. The researcher found that this multimedia learning programme is highly accepted by the respondents, as it leads to a productive and successful process of learning Arabic morphology.

Key words: Arabic morphology, multimedia learning, instructional design, web-based learning

Content

1- Description of innovation / product development / design / process.

A product deals with design of a computer-assisted programme in learning Arabic morphology by using multimedia via the World Wide Web.

2- The context or background of the innovation / product development / design / process.

This web-based learning deals with the issue of learning Arabic morphology by using multimedia via the World Wide Web as it seeks to help students to learn through the design of a computer-assisted programme. Among the objectives of this study are to know difficulties faced by many non-native Arabic language learners in learning Arabic morphology, and to know learners' perception on learning Arabic morphology by using the multimedia. In addition, there were three stages of academic procedures in the analytical approach. Firstly, learner's needs analysis which was completed before the design phase. Secondly, expert review which was conducted during the design phase. The third stage was the analysis of formative evaluation and pre- and post-test after the completion of the development phase.

3- Its importance to education.

- Help students to learn through online learning.
- Promote Arabic knowledge through life long and student-centred learning.
- Expose and encourage student to learn Arabic through an open source web-based platform.
- In accordance with technology 4.0 and suitable for digital generation nowadays.

4- Advantages of your innovation / product development / design / process towards education and community.

- Can be used as a platform in online learning activities for student in Arabic Morphology in various level of students as they are in universities, school, college, etc.
- Promote Arabic knowledge through life long and student-centred learning.
- Expose and encourage student to learn Arabic through an open source web-based platform.
- Toward technology 4.0 and suitable for digital generation nowadays.

5- Commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

- This is an educational website in Arabic Morphology which is suitable for all learners with the specialization of Arabic Language and Literature.

No	Evaluation Criteria	Result	Mean
1.	Interactive main interface	High	4.35

2.	The font type is suitable	High	4.19
3.	The font size is readable	High	4.22
4.	Interactive graphics and pictures	High	4.35
5.	Clear sound and voice	High	4.42
6.	Attractive animation	High	4.19
7.	Suitable use of colours	High	4.06
8.	Interactivity	High	4.26
9.	User friendly	High	4.39
10.	Learning content	High	4.32
11.	Overall performance	High	4.48

Table 1:

Conclusion

Result and

References

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Abstract: Instructional design models are used by instructional designers to guide the process of developing learning experiences with the aim of achieving intended learning outcomes. The Learning Design Matrix is a grid template that can be utilised by instructional designers, teachers, trainers, learning facilitators and other individuals who are interested in designing learning events that simplifies constructive alignment and addresses the needs of diverse learners all on one visual page. ADDIE, ARCS, ASSURE, and various other ID models have their own set of phases or steps, all based on sound research reflecting best learning experiences. The Learning Design Matrix aligns learning outcomes, learning activities and learning assessment on a grid while combining simplified Gagne's events of instructions to detail out activities that will be carried out in the learning event. Visual, auditory, kinaesthetic and read/write stimulus are also spelled out in the matrix to allow designers to gauge frequency of the usage of various stimulus, ensuring adequate triggers for all learning styles.

Key words: *instructional design, matrix, learning design, constructive alignment.*

Background

Getting learners to be engaged with learning materials seem to depend on the way they are designed and delivered. Although the 21st century learning approaches suggest using technology tools to increase student motivation and excitement, simply presenting videos and animations in class, for example, does not guarantee learning to happen when the tools and learning events are not properly designed.

Various instructional design models emerge based on the needs of learners to be engaged with the learning materials in order to achieve intended learning outcomes. The ADDIE model has been used as a guide by instructional designers to design and develop learning materials. Robert Gagne's Conditions of Learning published in 1965 suggest that there are internal and external conditions that promote learning. Motivational states and prior knowledge make up the internal conditions while deliberately and systematically planned instruction, make up external conditions that stimulate learning. Gagne (1965) suggested a set of instructions, or widely known as Gagne's nine events of instructions, conceived as a set of stimuli which give support to internal learning processes.

Innovation

Based on Gagne's nine events of instruction, the Learning Design Matrix was developed to provide instructors, teachers, and educators with a visual representation of instructional design. The matrix was developed by simplifying lesson plans, or learning plans into a grid that will allow instructional designers to see learning outcomes, learning activities and learning assessments in a snapshot. This matrix also allows instructional designers to see the flow of instruction, a variety (or otherwise) of learning materials used, and also the lesson's constructive alignment.

Elements presented in the matrix are based on Gagne's nine events of instruction that have been collapsed into five categories. The matrix then includes the topic, intended learning outcome, assessment, and learning activities which broken down into pre-instruction, content presentation, learner participation, and extended activity. From this grid, we can visualize the flow of instructions – how coherent the lesson is, and how each knowledge builds upon another; how frequent each tool is used; and whether a variety of teaching aids (visual, auditory, kinesthetic, read and write) are used. The Learning Design Matrix can be seen in Figure 1.

Figure 1: The Learning Design Matrix

Topic	Intended Learning Outcome	Learning Assessment	Pre-instruction	Content presentation	Learner participation	Extended activity

Significance

Instructional or learning design is one of the most important skills that educators should have to ensure the best learning environment and circumstances are prepared for the learners. The Learning Design Matrix is one of the fastest and most efficient way for instructors to develop their learning materials as it is visual in nature. This matrix can be used by just anyone who is delivering instruction and want to engage learners - classroom teachers, learning designers who develop online courses, corporate trainers, etc.

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ID NO.KUIS 001

**TOPIC: APLIKASI BELAJAR JAWI MENGGUNAKAN
AUGMENTED REALITY**

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Abstract: JAWI AR adalah sebuah produk berbentuk aplikasi mudah alih yang dibangunkan untuk pembelajaran JAWI bagi pelajar tahun 3 sekolah-sekolah rendah Jabatan Agama Islam Selangor (JAIS). Produk ini merupakan hasil penyelidikan yang menerima suntikan dana daripada Kerajaan Negeri Selangor bermula Disember 2017. Kajian terdahulu menunjukkan bahawa murid pada tahap satu sekolah rendah perlu menguasai JAWI kerana ia berkait rapat dengan pencapaian murid dalam Pendidikan Islam. Penyelidik turut mendapatkan data keputusan peperiksaan subjek JAWI tahun 3 bagi semua pelajar sekolah rendah JAIS daripada Unit Kurikulum, Bahagian Pendidikan JAIS. Justeru, teknologi AR dipilih kerana AR mempunyai keupayaan untuk meningkatkan tahap motivasi pelajar, kesannya yang positif dalam pengalaman pembelajaran, terutama untuk pelajar lemah. Elemen AR dalam pendidikan juga dapat membantu meningkatkan pencapaian murid. Metodologi yang digunakan dalam pembangunan aplikasi mudah alih AR ini adalah Model Reka bentuk Berarahan (ID) ADDIE. Penyelidik telah mengadakan tinjauan ke 2 buah sekolah iaitu SRA Bandar Seri Putra dan SRA Bangi Lama dan memantau sesi pembelajaran dan pengajaran JAWI tahun 3 di samping menemubual tenaga pengajar JAWI di sekolah tersebut. Produk ini amat penting bagi membantu para pelajar, guru dan ibubapa untuk meningkatkan penguasaan JAWI dalam kalangan pelajar menggunakan buku teks JAWI yang telah dipakai di seluruh sekolah-sekolah rendah agama JAIS yang menjangkau populasi sebanyak 5000 orang pelajar. Produk ini akan dilancarkan oleh Pengarah JAIS, Exco Pendidikan, Kerajaan Negeri Selangor dan Rektor KUIS pada bulan Disember 2018 secara rasmi dan dikomersialkan sebagai bahan bantu mengajar di semua sekolah-sekolah agama JAIS.

Key words: *Augmented Reality, belajar JAWI, SRA JAIS, aplikasi mudah alih*

Reference:

ID NO. KUIS 002

TOPIC: RODA KNV: PEMBELAJARAN ABAD KE 21

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Abstract: Roda KNV:PAK21 bermaksud roda yang mengandungi item-item komunikasi bukan lisan yang memenuhi 3 daripada 5 standard asas Pembelajaran Abad ke 21 iaitu komunikasi, kolaborasi dan nilai murni. Roda KNV:PAK21 merupakan sebuah produk yang dihasilkan melalui geran penyelidikan yang disuntik oleh Pusat Penyelidikan KUIS (RMC KUIS). Produk ini telah dibangunkan menggunakan metod kajian kuantitatif melalui soalan kaji selidik yang telah diedarkan kepada **252** orang sampel dalam kalangan pelajar daripada 2 buah universiti tempatan iaitu Universiti Sains Islam Malaysia (USIM) dan International Islamic University Malaysia (IIUM, Gombak). Obejktif kajian adalah untuk mengetahui amalan komunikasi bukan lisan yang dipraktikkan ketika pembelajaran Bahasa Arab di peringkat universiti. Data yang dikumpul telah dianalisis dan dapatan kajian menunjukkan bahawa KNV merupakan elemen terpenting yang perlu diterapkan semasa sesi pengajaran dan pembelajaran demi memenuhi standard PAK21. Dapatan ini amat penting bagi para guru amnya dan pelajar khususnya abgi memastikan tahap penguasaan Bahasa Arab dapat dipertingkatkan dengan mengamalkan KNV dalam P&P. Produk ini menjadi sebuah model dan rujukan bagi institusi pendidikan dan sekolah-sekolah yang menekankan PAK21 dalam P&P. Roda KNV:PAK21 akan dikomersialkan sebagai kit rujukan para guru Bahasa Arab di setiap peringkat pengajian.

Key words: komunikasi non-verbal, komunikasi bukan lisan, PAK21, kolaborasi, nilai murni

Reference:

ID NO. MMU02	TOPIC: Augmented Reality Enhanced Textbook for Accounting Education

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Abstract: The present project showcases a prototype of AR-enhanced textbook for accounting subject. Though AR has been widely implemented in many subject domains such as history, biology, geography, mathematics, and chemistry; however, AR has yet to be integrated in accounting domains. Thus, this project aims to fill this gap. The development of this prototype follows the principles derived from learning theories such as Cognitive Theory of Multimedia Learning and Cognitive-Affective Theory of Learning with Media. The resulting prototype allows learners to use mobile phones or tablets to watch simulations of work-example solutions related to accounting worksheets, which would be superimposed on physical textbooks.

Key words: *Augmented Reality, Cognitive Load, Multimedia Learning, Cognitive-Affective Theory of Learning with Media, Accounting*

Content

Augmented Reality (AR), which is one of the pillars of Industrial 4.0, can potentially revolutionize educational delivery in Malaysia. With smartphones or tablets, AR apps superimpose digital contents such as animation, voice-over, and 3D graphics unto a physical object such as textbooks, places, or learning subjects. While AR in education is still in its infancy phase, researchers and instructional designers have started to explore its benefits, often in terms of students' cognitive outcome, such as, their ability to answer retention, comprehension and problem solving examinations.

One interesting AR educational application is augmented reality textbooks (Kesim and Ozarslan, 2012). Through the use of Augmented Reality in printed book pages, textbooks will become dynamic sources of information. In this way people with no computer background can still have a rich interactive experience. Augmented book technology provides a multisensory approach to learning that links text, image, sound, and movement and is a highly motivational communication format. Using AR, it is possible to augment



the textbook so as to enrich the whole classroom learning experience by adding multimedia and three dimensional objects to the printed material.

Researches related to augmented reality in education have predominantly focus on subject domains such as mathematics, chemistry, geography, and astronomy. However, to the best of our knowledge, there are no studies have yet to explore the application of augmented reality in terms of accounting education. Thus, this project aims to fill this gap by positioning accounting subject as the subject domain that would be delivered via the AR-enhanced textbook. This research utilized learning psychology frameworks such as dual-coding theory and cognitive load theory (Mayer & Moreno, 2003) which emphasize on instructional design that should reduce cognitive overload of learners. Moreover, Moreno's (2006) Cognitive-Affective Theory of Learning with Media also inform the design of the prototype; in which interface elements such as colour, dialogue, and agent are designed to enhance positive emotion and motivation of learners.

This research project uses Aurasma, a software development kit for iOS- and Android-based mobile devices. The subject content pertains to the worked-example of an accounting work activity. The resulting prototype is beneficial for accounting students as it juxtaposes on the physical worksheet, visualization of demonstrative steps to complete the accounting process. This project may serve as a catalyst to enhance interest from the lecturers, educational content developers, and instructional designers to integrate AR technology in the domain of accounting education.

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ID NO. MMU03

TOPIC: Chatbot as Academic Information Facilitator

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Abstract: Chatbots are programs that are capable of simulating the role of a conversational partner through their capabilities of acquiring information and conveying responses in the forms of dialogues. The present project showcases a prototype of a chatbot system that uses artificial intelligence and natural language processing to acquire queries and provide responses related to academic information. The development of the system entails the use of wit.ai platform and machine learning to understand the semantics of the student's queries. A proof-of-concept has been developed, in which students are able to obtain information regarding academic matters via the chatbot system. This system can benefit students through its simple, yet user-friendly interface that provides humanized, intuitive, and social way of academic information dissemination.

Key words: *chatbots, conversational agent, academic information, natural language processing*

Chatbots are artificial intelligent programs that simulate dialogues with users. In line with the automation trend today, they are pervasively integrated in various digital domains such as e-health, online education, and e-commerce. Chatbots have the capabilities to allow a more natural and engaging way of human-computer interaction.

Recent researches have begun to explore the implementation of chatbot as an automated platform to manage academic information queries and dissemination (Ranoliya et al., 2017; Dibitonto et al., 2018).

The present project focuses on the development of chatbot as a tool to provide academic information to students of Multimedia University, Malaysia. The aim of this system is to allow students to type their queries and get responses through text messaging via the chatbot system. Academic related queries and responses include staff's contact details and their timetable, academic policies and procedures, and peer tutoring information.

At this juncture, a proof-of-concept chatbot prototype was developed. Python script was used to extract user's text and pass it unto wit.ai (i.e., cloud server). Wit.ai is an open platform that provides natural language processing service for the extraction of user's intentions and entities. The prototype chatbot also features web-crawler to extract academic information from the university's websites. The resulting information are packaged into a dialogue format via the chatbot messenger system.

There are certain projected benefits of positioning chatbot as a platform for academic information facilitator. Firstly, through the simulation of dialogue-based interaction, information queries and responses can be established in a more natural and social way (Reshmi and Balakrishnan, 2016); and thus enhancing higher rate of usage and satisfaction among users. Further, based on the computer are social actors framework (Nass et al., 1994), social cues such as personalities and stereotypes can be integrated into the design of agent-based systems (i.e., chatbots) to positively increase socio-emotive aspects of the human-agent interaction (Liew and Tan, 2016, 2018). Secondly, the use of chatbot as an automated, information facilitation tool allows information retrieval and responses to take place simultaneously among multiple users, without the need for direct human intervention. This feature could significantly lessen administrative costs and time.

Moving forward, this project demonstrates the potential advantages of chatbot as a promising tool in providing a more humanized, intuitive, cost-effective, and user-friendly interface that facilitates academic information queries and responses. Future works include exploring the design of chatbot from the perspective of socio-emotive design to enhance social aspects of user-agent interaction.

Acknowledgement

We thank Research Management Centre of Multimedia University for the Graduate Research Assistant Scheme in supporting this project.

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ID NO. MMU004

TOPIC: Digital Education for 21st Century Learners: A Holistic Ecosystem for Enhanced Student Engagement

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Abstract: The Malaysian Education Blueprint (Higher Education) 2015-2025 has called for innovations ecosystems that can develop holistic, balanced graduates. On a global scale, with the onset of Industry 4.0, there is a need for digital education innovations that support blended learning approaches, provides students with authentic learning experiences and seamless connections between the physical classroom and the online learning environment, cultivates 21st century skills, and captures students' academic journeys. Our 3-pronged approach to these issues was the development of Project EQUAD, a holistic ecosystem for blended learning, developed over 3 TMRnD projects, which has been in use since 2010: 1) MILE, an online multimedia and web learning platform that provided blended learning features such as a reflective blog, a videoconferencing and an eportfolio, 2) mPatches, a mobile platform for microlearning modules that supported e-learning content, and 3) DARE, where the physical learning space was enhanced through Augmented Reality (AR) technologies. This ecosystem operated on 4 elements of learning (EQUAD) which focuses on 4 dimensions of learning, which are, Engaging students through collaborative problems and design (Social), Enhancing their learning with stimulating multimedia applications (Cognitive), Empowering their skills with multimedia and web tools, and providing them a platform to think critically and creatively, strengthen their social interaction processes, and reflect on their learning process and goals (Technical), and Enjoying the process of knowledge construction, collaborative learning, critical and creative thinking, and creating ownership in their learning outcomes (Affective). This ecosystem has been received positively by students, and results showed that they became active and highly motivated learners, problem-solvers, collaborators, group and team players, and reflective thinkers.

Key words: EQUAD, Constructivism, Multimedia, Augmented Reality (AR), Microlearning.

Introduction

In today's world, the traditional chalk and talk method of lecturing is no longer conducive to learning. Interaction, collaboration and teamwork are integral in order to create effective learning environments. We are going beyond the classroom to impart knowledge to our students, the Generation Zs, known for Googling information and short attention spans. In order to address this, educators all around the world are challenged to find innovative and engaging approaches in order to interact with their students. In the "Malaysian Education Blueprint 2015-2025 for Higher Education", the Malaysian Ministry of Higher Education calls for all Higher Learning Institutions to use blended learning models as their pedagogical approach (MOHE, 2015). As such, classes in Multimedia University are now designed to incorporate the use of online web technologies with face-to-face class activities. Project EQUAD was developed to address these issues with an holistic ecosystem that was designed to provide students with authentic and positive learning experiences and skills.

Project EQUAD was a project that consisted of a 3-prong approach developed over the years through 3 projects:

- i) The MILE project - an engaging online learning environment was developed supported by multimedia and web technology.
- ii) The mPatches - supplementary learning materials were deployed through a mobile platform.
- iii) The DARE Project - the physical learning space was enhanced through Augmented Reality (AR) technologies. This approach allowed for a complete and holistic learning ecosystem.

and was designed to:

1. Cultivate a creative and innovative use of ICT in teaching and learning strategies.
2. Enhance the knowledge and the skills of instructional design for the integration of ICT in teaching and learning.
3. Develop and extend digital forms of teaching and learning materials and promote collaborative partnerships among group of experts in the development of digital resources.

In this system, students collaborate in class through group projects and are immersed in their learning with the addition of DARE's AR enhanced learning materials; at home they continue to be engaged through the MILE online learning platform that allows them to access their lecture notes and reflect on their learning; outside of home and class they can solidify their understanding through the mPatches micro learning modules on their mobile devices. The seamless integration and ease of use makes the learning



environment suitable for both students and teachers, as shown in Figure 1 below:

Figure 1. The ecosystem for student learning

Context of ecosystem and importance in education

The Project EQUAD's holistic learning ecosystem of MILE + mPatches + DARE operates on 4 elements of learning (EQuad) which focuses on 4 dimensions of learning, which are,

1. Engaging students through collaborative problems and design (Social)
2. Enhancing their learning with stimulating multimedia applications (Cognitive)
3. Empowering their skills with multimedia and web tools, and providing them a platform to think critically and creatively, strengthen their social interaction processes, and reflect on their learning process and goals (Technical)
4. Enjoying the process of knowledge construction, collaborative learning, critical and creative thinking, and creating ownership in their learning outcomes (Affective),

and incorporates sound educational learning pedagogies that have proven to be integral in improving student engagement and enhancing their learning process. These include:

1. Constructivist learning (Jonassen, 1999)

2. Web 2.0 Collaborative Learning (McLoughlin & Lee, 2010)
3. Authentic learning (Herrington & Kervin, 2007)
4. Problem-solving learning (Duffy & Cunningham, 1996)
5. Gagne's 9 Events of Instruction (Gagne, 1985)

1. *"It was engaging and interesting, so it was easy to absorb its content."*
2. *"I like that it is interactive and interesting and it makes learning more enjoyable."*
3. *"I can learn it anytime and anywhere and it provide so many information that are useful."*
4. *"By learning using the interactive web module, I feel more interested with the topic."*
5. *"It was amazing ,fun , never found it boring at all ,change my perspective in work on a website and I know how principle of doing the magazine".*
6. *"Easy and convenient. I can check blog, anything and anywhere when I am free. Most importantly, it is paperless".*
7. *"It gave an opportunity to me to improve on my work."*
8. *"I want to learn more because I can share or view other people's experience."*
9. *"More easy to understand the topic, more interesting, more example, got practice and quiz to test whether understand or not."*
10. *"Interactive, understandable, relevant, helps me understand better about the module. Help me motivate myself in learning this."*
11. *"The content helped me understand the topic in an interactive and practical way."*
12. *"Interactivity makes me have the thought of wanting to continue on with the learning and I found that the learning ends earlier than what I expected as I found it interesting."*

Student feedback were solicited to gauge their attitudes and perceptions towards this ecosystem. Table 1 shows their comments:

Table 1: Student feedback on the systems

Advantages / Benefits of the ecosystem

The Project EQUAD ecosystem captures students' learning experiences and provide a digital trail of their academic life in learning institutions. Consequently, the system provides the vehicle to realise the following benefits:

1. Supporting coherent management of a variety of achievements and pieces of work. These can be restructured and viewed in different ways for different purposes, for example, for reviewing learning, planning future learning, or providing evidence for an award or an employer;
2. Helping learners take control of their learning and their lives, by reflecting on their activities and planning future directions;
3. Providing a learner-centred rather than course-centred view of learning;
4. Giving appropriate views of achievement and learners' work to appropriate people, for example, the learner, teachers, mentors, careers advisers, potential employers, educational institutions to whom the learner is applying;
5. Facilitating a wider variety and more authentic forms of assessment;
6. Providing continuity through a learner's lifelong learning as they move between learning providers;
7. Encouraging reflection on practice and linking this with MQA's learning outcome standards; and
8. Linking learners' achievement and work with the skills required by their employers, helping to identify learning needs and "close the skills gap".
9. In line with Industry 4.0's call for the use of cutting edge technologies such as Augmented Reality (AR)in learning environments and classrooms and create graduates that are more equipped with problem-solving skills and creative thinking skills.

Project EQUAD's ecosystem of MILE, mPATCHES and DARE is a working product since 2010 and has been used in many classes in the Faculty of Creative Multimedia, Multimedia University. It has good potential



commercialisation value and marketability in other educational institutions and schools who want to include multimedia, web and AR technologies into their classrooms or online learning environments. The system supports the National Agenda highlighted by the Ministry of Education to increase the use of ICT in education and to address the lack of 21st century skills in graduates today. This project was shared during the MOHE's (Ministry of Higher Education) Best Practices Seminar and has been published in MOHE's Pelan Strategik Pengajian Tinggi Negara (National Strategic Plan) in 2013. The project which focuses on blended learning, project-based, and group-based approaches to learning has been used locally in Multimedia University, INTI International University and also internationally in Inje University (South Korea) for both undergraduate and post-graduate courses. We have a total of 12 copyrights, and over 20 publications in international refereed journals (SCOPUS) and conferences.

Acknowledgement

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ID NO. OUM 001
TOPIC: Teaching by Design through Cognitive Tutors

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Abstract: Most of the learning courseware/systems to learn Java programming language are merely repository of static and monotonous contents such as hyperlinked online tutorials, video lectures, etc. In order to address these shortcomings, I have developed seven cognitive tutors (CTs) application for my students to learn Java in an interactive and engaging manners. These CTs are the automated tutor that supports learning of Java programming via problem-solving steps. A cognitive tutor is defined as a tutoring system that utilizes a cognitive model to provide feedback to students as they are working through problems. These CTs had been developed based on "Teaching by Design (TbD)" instructional framework. TbD is an example of backward design, the practice of looking at the learning outcomes in order to design instructional method. TbD focuses on teaching to achieve understanding among the learners and not merely memorizing the facts. CT which is able to support "learning by doing" and itself being an "expert system" allows us to implement TbD principles effectively. CTs that I had developed are able to support "learning by doing" and an "expert system" that uses problem-based learning and active learning instructional principles effectively. My CTs are self-contained, interconnected and are able to initiate a learning process for a particular learning outcomes and provide feedback to students as they are working through problems. This feedback will immediately inform students of the correctness, or incorrectness, of their actions through chat conversation between the cognitive tutor and a learner. Unlike other cognitive tutors that support only few plain steps that can be completed in couple of minutes, each of my cognitive tutors are able to engage the learners' in the "one-to-one" session of the problem-solving process for more than 1 hour through conversing with the student. In addition, my cognitive tutors have the ability to provide context-sensitive hints and instruction to guide students towards the next steps. These cognitive tutors will start from program design, program development and ends with program execution. The feedback from the students and the effect of these CTs on the students' understanding of the subject matter were favourable.

Key words: *cognitive tutors, programming*

INTRODUCTION

Learning to program especially Java is difficult. Make one typo in any of a dozen areas, and the program stops working, and there's no good diagnostic and learning tool to help you out. A lot of people including students get excited by the 'learn code' craze. They expect that they can become a code pro just by completing a tutorial or two. So they find some code tutorials online, complete them, but then realize that they're not getting anywhere. They're not a code pro, and they still don't have a clue how to produce a program. But with SEVEN Cognitive Tutors (CTs) application that I have developed for the course CBOP3203 (Java Programming), anyone can learn Java through an automated tutoring via cognitive tutors that comes with an enhanced Java coding editor. The motto of my cognitive tutors is "Converse, Learn & Code Java". CBOP3203 is an undergraduate course with 3 credits (120 learning hours) and it is compulsory for all students taking Bachelor of Information Technology at OUM. The cognitive tutors are made available through university's learning management system which uses Moodle.

UNIQUENESS

Most of the learning courseware/systems to learn Java are merely repository of static and monotonous contents such as hyperlinked online tutorials, video lectures, etc. The advantage of the application that I have developed is that it supports the learning of Java without the intervention of the human instructors. All the expert knowledge on Java are captured by the automated tutor. Given below are the main uniqueness of my Cognitive Tutors for Java:

- Cognitive Tutors that I had developed support human-like interactive dialog to help students learn how Java in an interactive and engaging way
- My Cognitive Tutors are able to carry on a running conversation, complete with probing questions, positive and negative feedback, follow-up questions and requests for explanation as

to why something is correct as well as interactive exercises based on “behaviour recording” approach

- My Cognitive Tutors allow the learners to actively construct knowledge through conversation in order to solve a programming problem
- Unlike other cognitive tutors that support only few plain steps that can be completed in couple of minutes, each of my cognitive tutors are able to engage the learners’ in the “one-to-one” session of the problem-solving process for more than 1 hour.
- While dialogues/conversation are important in learning programming but programming can’t be learnt entirely on these constructs. Thus, my cognitive tutors are also support animated-based explanation and visualizations, so that difficult concepts can be explained easily for easy understanding and to reduce the mental load of the students when learning programming
- My cognitive tutors are self-contained and have the ability to provide context-sensitive hints and instruction to guide students towards the next steps. My cognitive tutors will start from program design, program development and ends with program execution. This provides a holistic approach in learning programming
- The Java editor incorporated inside the cognitive tools enables the students to type and compile Java program while interacting with the automated tutor. Thus, my cognitive tutors support the concept of “learn and code”.

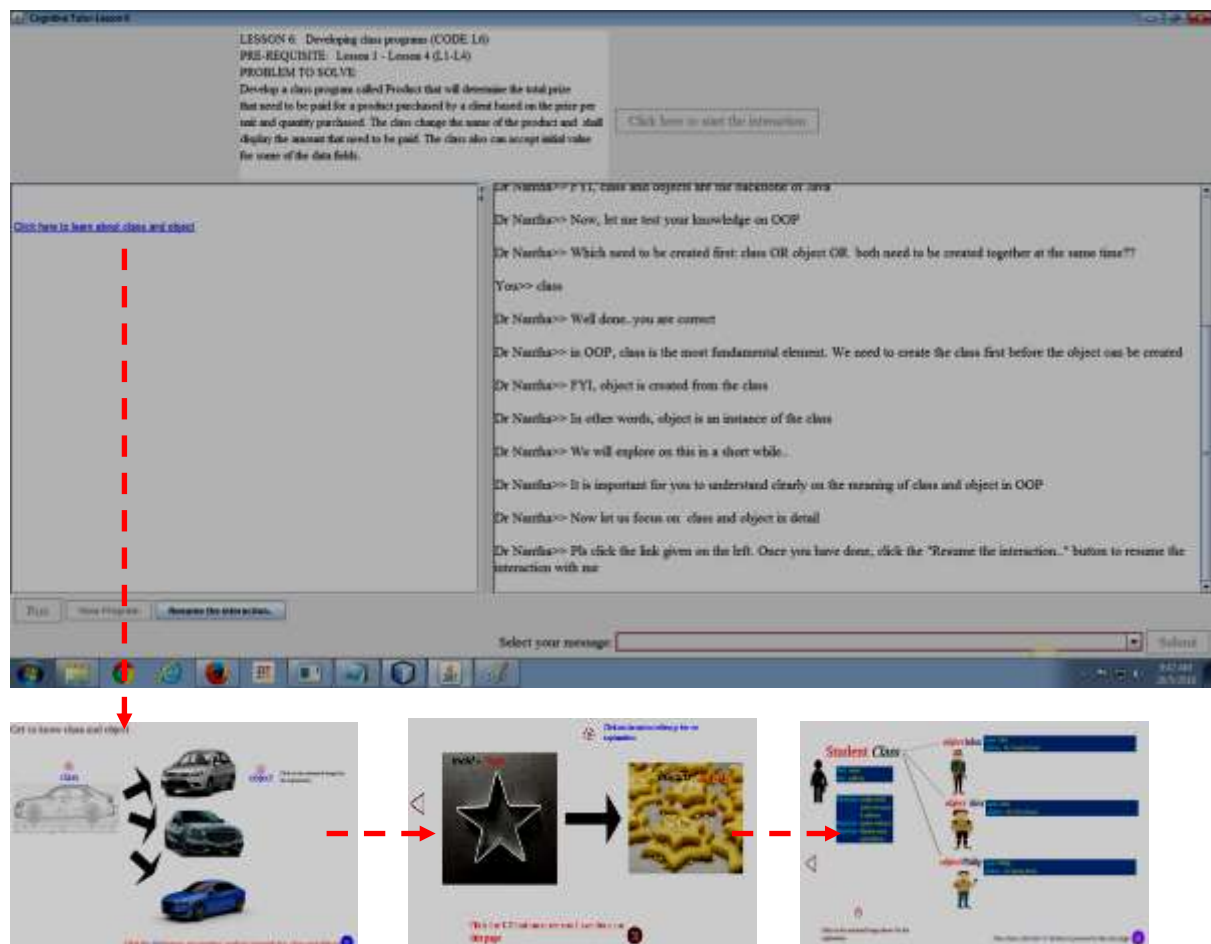
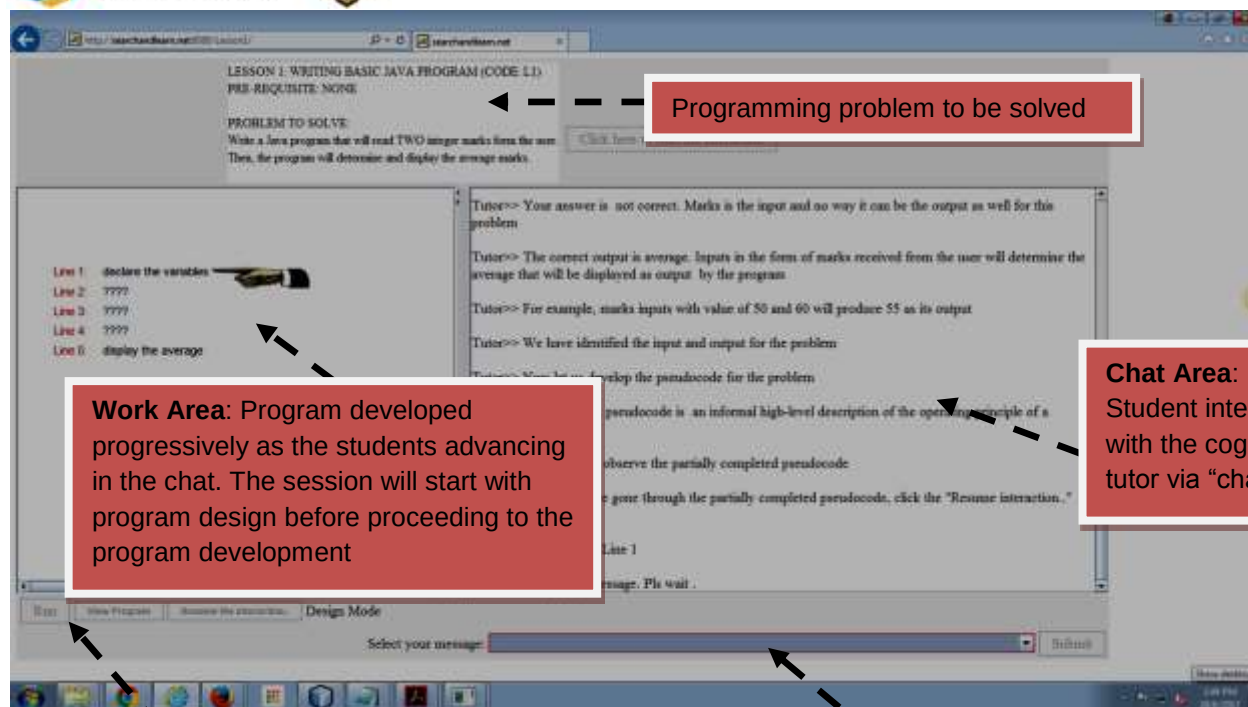


Figure 1 The cognitive tutor contains a comprehensive lesson for a particular topic/concept



Work Area: Program developed progressively as the students advancing in the chat. The session will start with program design before proceeding to the program development

Chat Area: Student interact with the cognitive tutor via "chat"

At the end of the session, students are able to run and view the output of the program that been developed in the session

Students enter their messages/feedback here

My ... in features of the cogni ... "teaching by design" pedagogical principles by Wiggins and ... al principles by Nantha Kumar Subramaniam (2013).

FUNCTION AND FEATURES

SEVEN Automated COGNITIVE TUTORS had been developed. Each of these focuses on particular programming Java constructs such as if-else, for-loop, while-loop, array, etc. The main functions and features of these cognitive tutors are given below:

- Interaction between the automated tutor and the student is done through chat-based GUI. It supports constraint-dialogue and open-ended replies from the students
- A programming problem will act as an anchor in the cognitive tutors
- These cognitive tutors are self-contained and have the ability to provide context-sensitive hints and instruction to guide students towards the next steps.
- The cognitive tutors will start from program design, program development and ends with program execution
- A Java editor is included in the cognitive tutors. This allows the students to type their programs and compile it. Unlike the conventional Java compilers that merely produce the errors listing without any guidelines to the students in solving the error, my system is able to guide the learners if there is any errors in their program.
- Difficult concepts are explained through animated notes hosted in a cloud. These animated notes can be enhanced or revised anytime without changing the source codes of the cognitive tutors
- Some of the cognitive tutors have interactive exercises developed based example-tracing approach based on behaviour graph. It provides contextual hints in order for the students to solve a programming problem



Technologies used to develop this application are Java, Servlet (server-based Java) and HTML5. My cognitive tutors are stand-alone application connected to the Internet. My cognitive tutors are not a prototype, but a full-fledged working system. The system is already being used by the students. Thus, my cognitive tutors can be commercialized in a short notice.

PEDAGOGICAL PRINCIPLES

Teaching by Design, or TbD, is an educational planning approach. TbD is an example of backward design, the practice of looking at the outcomes in order to design the learning instruction. TbD focuses on teaching to achieve understanding. It is advocated by Wiggins and McTighe (2005).

The backward design approach has three stages. Stage 1 is identification of desired results for students. This may use the learning outcomes of the course. Stage 1 defines "Students will understand that..." and lists essential questions that will guide the learner to understanding. Stage 2 is assessing learning strategies. Stage 3 is listing the learning actual activities that will lead students to the desired results. TWO main underlying pedagogical principles adopted by my CTs to support Stage 3 are problem-based learning and active learning.

Problem-based learning (PBL) is a student-centered approach in which students learn about a subject to solve an open-ended problem (Wood, 2003). These CTs that I had developed provides students with the opportunity to develop their PBL skills through:

- Self-awareness and evaluation of the learning processes
- Working independently
- Critical thinking and analysis
- Explaining concepts
- Self-directed learning
- Problem solving that are engaging & stimulating

Active learning is generally defined as any instructional method that engages students in the learning process (Revans, 2011). In short, active learning requires students to do meaningful learning activities and think about what they are doing (Prince, 2004). My CTs are embedded with the interactive exercises that allow the students to practice skills. This include completion of problem solving exercise and the cognitive tutors give and discuss the correct answers. The CTs also use questioning strategies in which the students will be asked questions that are related to the concepts covered in order to put them in the proper context.

CONCLUSION

Human tutoring is an extremely effective and enjoyable way to learn. But, buying one computer per student is a lot more cost effective than hiring a teacher for every student. A computer program such as the cognitive tutors that I had developed are able to bring a centralised expert to the students in a engaging and interactive manners irrespective of the geographical boundaries.

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ID NO. TU 001
TOPIC: Experience and express: The Effect of Using Multiple Mobile Apps for Foreign Language Practice
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Abstract: Mobile applications (apps) have been used to support an engaging and interactive learning over the past several years. However, most mobile apps for language education were developed for vocabulary and simple grammar exercise despite the tendency to avoid knowledge-based learning. Hence, it is important for instructors to encourage and guide learners to use learning activities and functions in the mobile apps not only to conceptualize a language personally, but to express themselves and build connectedness with others. By using survey questionnaires and interview, this study attempts to explore the learning patterns of learners and affective aspects of Mobile-assisted learning towards the use of three mobile apps in a beginner level Korean language university elective course. Three apps chosen for the study are *TIMEs* (Taylor's Integrated Moodle e-Learning System), *Quizlet* and *Naver Blog*. All three use both mobile- and computer-based platforms to serve a distinct purpose in learning. In this approach, what is truly significant for instructors is how the learners are exposed to the meaning input in a particular context, as well as how they reproduce the learning contents to express themselves to others using the apps as a communicative space. The results are presented in six categories, namely flexible use, interactivity, engagement, motivation, connectedness, and personalization. The findings of the study may help other instructors adapt the idea and seek more opportunities and availability of using mobile apps to serve their purpose.

Key words: Mobile-assisted language learning (MALL), Educational mobile app, Humanizing Technology, Out-of-classroom learning.

Content

A. Introduction

One of the concerns of learning a foreign language is finding a time and space to practice the target language outside of the language classroom. This lack of practice then creates learners who are not confident and are hesitant to use the target language. Considering the significance of practicing the language in daily life and the current generation in a digital age, it is not surprising that language teachers have adopted technology into their teaching and learning context. Mobile language learning is quickly growing with the spread of smartphones and the effectiveness and potential of the role that mobile applications (apps) play has been discussed over the past two decades. This paper attempts to explore an alternative approach of using multiple mobile apps in foreign language learning and its effectiveness according to the student's responses.

Mobile-assisted language learning (MALL) has been defined by Kukulska-Hulme as the use of mobile technology in language learning, especially in situations where device *portability* offers specific advantages.¹ The portable devices discussed in this study are smartphones and table PCs where mobile apps are available.

According to a research by Google, mobile is assisting people in their micro-moments and people are empowered by mobile every day. Mobile quickly delivers results when they are impatient, provides inspiration at their fingertips when they are curious, and gives them a personalized experience when they are demanding one.² This encourages language instructors to explore more of potential use of mobile apps in language learning because language is skill- and experience-based subject.

B. The Study: Objectives and Methodology

¹ Kukulska-Hulme, 2013, p. 3701

² Source: <https://www.thinkwithgoogle.com/consumer-insights/smartphone-productivity-tools/>

This study aims to examine a practical and effective use of multiple mobile apps for beginner-level Korean language learners to practice their language skills, while improving their learning motivation and interactivity.

The chosen mobile apps for the study were three:

- a. *TIMEs* (Taylor's Integrated Moodle e-Learning System)
- b. *Quizlet*
- c. *Naver Blog*.

All three apps provide both mobile- and computer-based platforms that are free and easily accessible. Each app serves different purpose depending on its features and functions. Learning related activities available in these apps are as follow.

- a. *TIMEs*: Assignment submission, viewing learning outcomes, reviewing individual's learning progress, downloading learning materials, attempting online quizzes (graded) and sending message to lecturer.
- b. *Quizlet*: Viewing the list of words and expressions, listening to the pronunciation, attempting quizzes and games (non-graded) and reviewing analyzed quiz results.
- c. *Naver Blog*: Publishing posts, sharing role-play scripts and videos, communicating with lecturer, peers and other blog users, and creating learning e-portfolio.

The activities mentioned above were introduced in classroom with online guideline and the students were advised to download these mobile apps on their mobile devices at the beginning of the semester. Therefore, they are able to use the apps and their features selectively according to their needs and intention of learning. For instance, if a learner intends to develop vocabulary, *Quizlet* would be the most relevant platform. Among the activities stated above publishing posts in Korean and sharing role-play scripts and videos were also given as part of their coursework using *Naver blog*.

The study was conducted on a group of undergraduates enrolled in beginner-level Korean language university elective course at Taylor's University. At the end of the semester, the students' opinions regarding the effectiveness of using multiple mobile apps to practice and improve their language skills were measured through questionnaire. This questionnaire consisted of Likert-type, multiple choice questions and short answers.

C. Innovative teaching and learning practice using mobile apps

(1) Consistent and meaningful input: Systemized and informative layout of the apps provides consistent inputs. Learning contents and activities are given thematically and the learning outcomes and grammar points are always given on the top of the mobile screen when they access *TIMEs* mobile app to download material or attempt post-class quizzes. The learners are able to capture the contents in contexts.

(2) Integrated and complementary learning route: Using multiple apps is expected to supplement the limitation of existing mobile apps for language education. These apps are mostly used in confined range such as simple word memorizing practices or grammar exercise. Various features introduced in the apps encourage students to practice specific aspects of the language such as speaking, writing, reading and learning vocabulary. It provides additional communication routes and better interaction with instructor, peers and other app users. The keyboard setting on mobile devices facilitates writing practice and publishing posts in Korean. *Naver blog* can be categorized as "repurposed apps". This term indicates those general purpose apps that could be used in language learning.³ It also implies that this approach can encourage learners to reach higher cognitive level: knowledge, comprehension and application.

(3) Humanizing technology: Finding shows that students obtained a sense of individuality and community as well as motivation of learning through participation in learning related activities in the apps. Learning with mobile is a learner-centric activity and mobility of learners respects the different learning style and pace. It also impress on learners the importance and value of using target language in daily life. Furthermore, to encourage them to express themselves using target language believing that the posts will be viewed by other users, unknown individuals. Finding also proves that the learner's engagement and connectedness in learning progress is improved.

D. Conclusion and commercial value

Findings show that this approach of using multiple mobile apps in foreign language learning is effective not only in building linguistic knowledge and practicing language skills, but also in personalization of knowledge and creates sense of connectedness among the peers and instructor. It also shows the potential of various mobile apps for teaching and learning purpose; for example blog users who post

³ Robert Godwin-jones, 2011



according to their special interest or expertise, can create advertising revenues similar to YouTubers. Finally, developing different type of app for the foreign language learners can be considered. App will help users to connect with others who are learning a foreign language for a similar purpose (e.g. travel, student exchange, business).

Acknowledgement

I would like to thank Taylor's University e-Learning Academy for all their support.

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ID NO. TU 002
TOPIC: Talk2me 2.0: Extending conversation and Deepening Learning
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Abstract: This work presents a follow-up project on an innovation called "Talk2me". Talk2me is a backchannel with a blend of traffic-light monitoring assessment. It deals with the improvement of Talk2me with an integration of few other features as suggested by users from the previous pilot project. As a background, Talk2me offers an alternative to the traffic-light cards strategy, with an additional feature of including how the students perceived their performance. It is a web-based backchannel where upon inserting their names, students are able to pick either "red", "yellow" or "green" to represent their perceived-ability in performing the task, plus an added advantage where they are able to articulate the concerns they have about the task they are attempting. With the extra feature of how they can put in their thoughts into words, "Talk2me" allows mature learners to communicate the questions they have, and get answered by their teacher in real-time. Recognizing the diverse intelligences of learners, Talk2me 2.0 include several other features where users can include image and video link, start a chat or exporting chat for future references and revisions. This work also presents findings about the impact of Talk2me from the learners' perspectives, based on a case-study. To conclude, Talk2me augments the traditional classroom by giving each student a voice, and humanising the way learning is done using technologies.

Key words: *Formative assessment; Web tool; Visible learning; Digital traffic lights; Humanising technologies*

Content

Traffic light is a strategy that allow students to self-assess their progress in meeting the learning goals set by the teachers. During task individual task completion of a typical classroom, teachers would usually walk around to facilitate the completion of the tasks assigned to the students. Traffic light cards are used by the students to indicate their ability to complete the task, which also serves as a cue to the teacher about his or her students' competency. "Green" colour infers that a particular student is swift at completing the task given, "yellow" means the student is able to do but is not confident with his or her work while "red" means the student needs help. The teacher would follow this pattern of recognition by offering help to those students who indicated "red" and even get those students who indicated "green" to assist students who displayed "yellow" cards. This strategy allows teacher to focus on students who are really weak, and allow scaffolding to happen intensively among the weak and moderate students in class.

Talk2me offers an alternative to this strategy, with an additional feature of including how the students perceived their performance. It is a web-based backchannel where upon inserting their names, students are able to pick either "red", "yellow" or "green" to represent their perceived-ability in performing the task, plus an added advantage where they are able to articulate the concerns they have about the task they are attempting. With the 2.0 version which includes an Admin-page, users are able to attach image, video link, start a chat and exporting chats for their future reference.

Getting the students to recognize their own ability is a self-regulating endeavour, which is important for their metacognition (Hattie, 2009). The exercise of getting the students to know where they are at in their learning, and the destination they need to arrive at is one of the most vital ingredient to produce students who are metacognitively sound (Hattie & Yates, 2014). Besides that, the usage of the tool also encourage collaboration among the advanced-students and those who are still struggling in achieving the learning targets of any particular topic. The dynamic of classroom integrating collaboration is really an element which cannot be overemphasized in producing learners of the 21st century. Talk2me 2.0 augments the traditional classroom by empowering the students to take charge of their learning. It would be highly valued as a useful educational tool which enables instant formative assessment and feedback.



Figure 1: Screen-grabbed from <http://talk2me.uitm.edu.my/>

Acknowledgement

Talk2me is an Intellectual Property (copyright) registered under Institute of Research Management & Innovation, University Teknologi MARA.

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ID NO. TU003
**TOPIC: MATHIFICATION: GAMIFYING LEARNING THROUGH
DIGITAL CREDENTIALS**
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Abstract: Integrating game mechanics with digital credentials is a potential incentive that amplifies and transforms the level of student engagement. The main principles of gamification are twofold: (1) it allows learners to compete with themselves and others; and (2) to know how close they are to accomplishing a certain set of goals and acquiring its accompanying rewards or reputation. Skill acquisition in both learning interfaces (brick and click) are not commonly recognised and rewarded, compared to cognitive learning outcomes. Hence, gamifying learning plays an important role in addressing the gap in assessing and recognising learning skills. Meaningfully, it humanises technology by contributing to students' personal and professional development through fun and engaging ways. In the context of a teacher education programme, gamification is incorporated in math courses to boost skill acquisition (content, pedagogical and technological skills), participation, motivation and performances among student teachers. This is done through online quest and challenges, presentations, e-content development and teaching simulations. Gaming elements such as stamps, badges, points and leaderboards are used to recognise achievements especially with regards to the fundamental elements of teacher expertise. Data from this study suggests that gamifying learning through digital credentials do not only improve cognitive engagement, but also provides opportunity for self-reflection with a sense of competitiveness among learners where their skills are "measured" and recognised. These credentials can then be transferred into a teaching portfolio where, as a form of digital profiling, reflects the competencies of a beginning teacher.

Key words: gamification, gamifying learning, digital credentials, badges

Content

Digital credentials and skill recognition

Critical to a career is how academic teaching skills are assessed and what value and recognition they are given (Merk, 2017). For a beginning teacher, teaching proficiency may not be accurately represented by the common academic notion of the cumulative grade point average (CGPA) or the grades attained in the teacher education programme. National frameworks for teacher education are increasingly being formulated in terms of competences (Biesta, 2015). Hence, it is important that the skills delineated under the TPACK framework (Technology, Pedagogy and Content Knowledge) are comprehensively appraised so that their competencies are gauged not only through grades but also through skill-based assessments and portfolio.

Mathification is an approach in a teacher education course that is based on the concept of gamification where various aspects of game mechanics are integrated to improve student engagement and as a form of skill recognition in teacher education. The main principles of gamification are twofold:

(1) it allows learners to compete with themselves and others; and (2) to know how close they are to accomplishing a certain set of goals and acquiring its accompanying rewards or reputation.

In this approach, students are awarded stamps and badges by completing both in-class and online tasks. The stamps are awarded in three categories that correspond to the Technology, Pedagogy and Content Knowledge (TPACK) framework. The TPACK framework is a complex interaction among three bodies of knowledge that is required as components of teacher knowledge and competency (Koehler & Mishra, 2009). The TPACK framework builds on Shulman's (1987, 1986) descriptions of pedagogy and content knowledge (PCK) to include the integration of educational technologies. These three components forms the basis of the understanding of subject matter knowledge (content), understanding of learners and learning (pedagogy) and the use of technology to improve learning. In addition, bonus stamps will be given for exemplary behaviors such as coaching another student, writing good reflections and demonstrating creativity in lesson planning and implementation. Accumulated stamps will then earn them badges with its accompanying rewards for the course.

Throughout the course, students will engage in various tasks for opportunities to earn stamps and badges. Tasks such as presentations, teaching simulations, quizzes, online quests and challenges, and e-content development will each allow students to earn different set of stamps depending on the nature of the task. After each activity, the stamps will be awarded after which the students will be able to see the leaderboard that shows how they rank among their peers (see Figure 1).

Figure 1: Ranking and leaderboard.



Context and implementation

The Mathification approach has been implemented in two of the math modules in an undergraduate teacher education programme: Teaching Primary Mathematics, and Statistics at Primary Level. In these modules, all three components of the TPACK framework are being holistically profiled after completing a series of task. These tasks serve as opportunities for student teachers to demonstrate their initial competencies with regards to content, pedagogy and technology skills. An online platform is set up for students to access the online tasks and also to view their accumulated stamps and leaderboard. An example of the Mathification platform can be viewed at: <https://sites.google.com/view/milepost-challenge/home>. At the end of the course, a digital portfolio can be generated for each student teacher based on their scores for each TPACK component.

Significance

This project adds value to students' learning and to teacher education in several ways.

(i) Recognition of teaching competencies

Teaching skill recognition among student teachers are important as common assessment methods and academic results do not portray these skills holistically. Gamifying learning through digital credentials in Mathification recognizes and rewards students' technology, pedagogy and content knowledge as these are the main components of teacher competency.

(ii) Increased engagement and motivation

In many studies, students' levels of engagement increased significantly following the introduction of game elements (Berkling & Thomas, 2013; Brewer et. al., 2013, Gibson et. al., 2013 & Raymer, 2011). In the Mathification approach, students are engaged in both in-class and online tasks. The use of badges and leaderboards increase their motivation to participate as well as their engagement with the materials presented. Some of the captions from students' feedback that support this claim include:

Student 1: "I was very impressed and grateful for the effort Ms Mindy put in to making milestone battles, rewards, and giving us feedback for the work we did. It really made classes more fun and I could tell I was working towards achieving specific goals."

Student 2: "The use of stamps serves as a great motivation, which makes the class more interesting."

(iii) Identify skill and knowledge gaps among student teacher

As stamps are accumulated, students are able to see their progress and class ranking for a particular module. This allows the student to identify their strengths and weaknesses with regards to teaching competencies on two levels. Firstly, how they fare in each of the TPACK components, and secondly, how they fare among their peers. This promotes skill-based competitiveness among the students as well as opportunities for students to reflect on their development as a beginning teacher.

Conclusion

Mathification is an approach to boost skill acquisition, participation, motivation and performance in teacher education courses through the use of gaming elements such as stamps, badges and leaderboards. Alternative skill-based assessments are used to recognize teaching competencies among student teachers with regards to the TPACK framework. This is a significant form of teacher profiling as the traditional indicators via CGPA and grades may not fully reflect these competencies expected of a beginning teacher. As the Mathification system captures students' TPACK attainment, it can be incorporated in a digital portfolio or resume for personal or professional development purposes.

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ID NO. TU004
TOPIC: Transforming Online Learning Beyond the Digital Data
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Highlights:

Since its emergence in countries like the US or Australia in 2006, the MOOC or Massive Open Online Courses has also seen a steady increase in its popularity in Malaysia. MOOC has been viewed as a suitable platform to cater to a massive number of learners around the world to connect at one single point. The given assumption is that learners are perceived to absorb knowledge from lecture materials obtained from the MOOC and subsequently assess their understanding from the given activities. Nevertheless, an invisible boundary which separates learners' learning experience and the digital content available exist and this is known as the human touch. In a study by Kuong (2015), it was shown that less promising virtual community connection created a doubt on the quality of content among learners. Although self-evaluation will direct the student's behavior and create motivation towards learning (Bandura, 1986), online learning which relies on digital content can merely provide learners the flexibility in accessing content, but not in learning. By Humanizing Technologies, learning happens naturally for the learners while being supported in their cognitive capabilities (Driver, 2017). It is evident that human connection and emotions are pertinent in creating chemistry in learners' mental processing to learn, unlearn, and relearn new knowledge. This realization led to the creation of the Business Presentation MOOC, which was designed by integrating the humanizing factor to boost the learners' sense of being in the learning process. This instructor-guided course guides the students' learning with concise targeted videos – rather than full-length lectures, as well as build the sense of belongings to form a strong virtual community connection that leads to engagement, motivation, and natural learning to happen. Furthermore, to ensure high engagement is maintained with students, a framework was developed based on a gamification concept by utilizing the features in the OpenLearning MOOC platform itself. Students' acceptance level of the course as well as their completion rate and qualitative feedback were positive.

Key words: *Humanizing Technologies, Gamification, Virtual Community, Business Presentation, MOOC*

CONTENT
DESCRIPTION

The ability to present successfully is undeniably one of the most challenging task faced by many. The challenge is further added when the presentation is required in the business setting. To cater to this need, this engaging module on business presentation was designed through an online mode as a Massive Open Online Course (MOOC) using the OpenLearning Platform. This five week



short course is included as part of a blended learning approach in an English and Business module to Taylor's University foundation and diploma students.

A core nature of online learning is self-direction, hence, maintaining learners' motivation along the process of learning is important for successful learning. With a high level of motivation, learners will effortlessly be fully immersed and engaged in the learning activities which result in a more meaningful learning. To ensure that this learning process naturally happens in learners' mental processing, it is essential that online learning goes beyond the digital data and technology. This is achieved by adding the human element into a digital data to create a chemistry between the learners and the learning environment, subsequently eliminate the gap that occur in between face-to-face and online learning environment. Through this, students feel the sense of community in virtual learning and are confident and secure in sharing their answer in a public environment. In addition, the students' behavior which saw them exhibiting similar behavior in the MOOC as in class only proves to show that although students were mentally in a virtual environment, they were aware of the presence of their peers and instructors.

DESIGN AND DEVELOPMENT

For learners to be truly engaged in learning, they have to be behaviorally, intellectually, and emotionally involved in the learning activities (Wang, 2007).

Firstly, to humanize the Business Presentation MOOC, the focus was on visual and interactivity. Also, gamification elements such as challenge, time factor, progress indicator, and rewards were added to arouse their curiosity and cultivate learners' positive feeling.

The technique that was applied in this MOOC involved using a character graphic to represent the course instructor in order to bring out the humanization sense in the visual appearance. Throughout the entire topic in this course, the similar vector character with the instructor real face used to give a feeling of the instructor's presence in the course and to naturally bring the students' mindset to replicate their instructor with that visual character. Apart from applying a visual character to replicate the instructor, the homepage was designed with welcoming notes, promotional video, and announcements, to build the connection between the instructor-students-learning environments.

Interactivity in online learning can be achieved via interaction between instructor-students-peers and the activities that open a door to share their thoughts to everyone. The learners' interactivity pattern that indicate freedom, security, and confidence, shows their sense of belonging in a virtual community. Using polite and friendly language tone in online interaction will give more meaningful experience for better learning gains (Clark & Mayer, 2011) (as cited in Betul C. & Schmidt, 2017). To provide the opportunity for students to get to know each other and build rapport, the first activity required them to upload their profile pictures. Subsequently, as the learners moved along the course, forum activities allowed them to share their answers with other learners. The kudos or 'like' feature was also used as an interaction tool to express their positive feeling towards their peers' answers.

Motivation varies for different students. Thus, the gamification element is applied in this MOOC as a guide for self-directed learning as well as to create a challenging and thoughtful learning experience that is consistent with the learners' perspectives and values. In addition, the time frame and progress indicator in this MOOC act as a control measure and a constraint to create a challenging sentiment in learners' behavior. Indirectly, learners are more competitive and set their own goals to reach their learning achievement. To further inspire learners, rewards in the form of online digital badges are used to boost their motivation at certain milestone. Finally, successful learners receive the completion certificate to designate the learning value that they have obtained throughout the course.

IMPORTANCE

Learners in the MOOC need not necessarily be business students as almost every specialization requires effective business presentation skill. Having acquired this skill, learners may take advantage of it in other modules, if they are still pursuing their studies. According to a survey by The Chronicle of Higher Education and American Public Media's Marketplace (2012), the top



skills employers look for when hiring college graduates are "written and communication skills." In many cases, employers have quoted cases of candidates not being able to communicate and present themselves during an interview. This MOOC does not only equip learners with business presentation skills, but through the carefully planned activities, forum discussion, sharing and gradual process of learning, learners acquire confidence and communication skills simultaneously. These transferable skills are soft skills that are sought after by employers but ironically, lacking in graduates.

For adult learners, being successful in business presentation will certainly give them an upper hand in their career. It is not surprising to learn that a survey in America by Prezi and Harris found seventy percent of respondents agree that presentation skills is crucial for career success (Forbes, 2014).

ADVANTAGES

The benefits of this MOOC is ultimately its nature which is online and flexible. But apart from being just an online platform that disseminates information, this MOOC is unique as it encourages communication amongst the learners. With the core focus to humanize this MOOC, learners acquire skills to be a successful business presenter through real life activities, sharing of information and experience through relevant discussions with peers and instructors and at the same time, are motivated to do this through their personal initiatives.

COMMERCIAL VALUE

In terms of commercialization potential, a MOOC on Business Presentation provides various avenues for marketability. A module of this nature, which assist graduates and students to improve their soft skills is ideal as a standalone graduate or school leavers development programme. In addition, an online course on Business Presentation provides accessibility to employees who have limited time and require flexibility. This MOOC is perfect for employees in organizations who have interest in attaining proper business presentation skills. Learners have the flexibility to learn at their own pace and interact with learners from other background and levels.

This course is also a good component to be included in an English module in any higher learning institution. As language and presentation skills are interconnected, students who master both language and business presentation would have the added edge as compared to their peers. Finally, this MOOC is generally suitable for all level of learners who thirst for self-development.

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ID NO. TU005
**TOPIC: Digital Badges: Achievement-Based Recognition
beyond Assessment**
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Abstract: Engaging students and sustaining their interest during online learning activities prove to be one of the challenges faced by educators in teaching the new generation of learners. Although most of the students are avid technology users, sustaining their interest while learning online requires more than just being digital literate. Thus, there is a constant need for educators to seek new teaching methods and approaches that will encourage and motivate students to be active online learners. The introduction of digital badges is increasingly gaining recognition as an alternative to assessment system. It provides recognition in digital representation associated with the tasks assigned, and is said to increase motivation and perseverance through rewards and recognition. It also reveals that badges that have been embedded as an additional incentive into learning are able to increase learner motivation and sharpen self-regulatory learning skills. Despite this assertion, little research has been done in this area. By using survey questionnaire, this research thereby intends to investigate the effect of digital badges on students' motivation in completing the required tasks through the university's learning management system and will specifically look into: 1) the learner's perception on how digital badges affect their online learning experience; 2) impact of digital badges on students' motivation (intrinsic and extrinsic) to participate in online activities and, 3) the extent to which design of the badges and learners' attitude toward the digital badges may influence the strength of motivation to participate. It is hope that the findings of this research will help other educators in motivating their students in participating in online learning activities.

Key words: *Digital Badges, Achievement-based Recognition, Humanizing Technology.*

1.0 Introduction

With constantly evolving e-learning spaces, students' motivation to participate in online learning activities is at the heart of many of higher education's most interesting problems, both as a learning outcome of social environments such as competing in a quiz game (e.g. Kahoot), and as influential factors on behavioural variables such as perseverance, self-regulatory and performance. The use of digital badges is seen in this case, to be effective in motivating the students to continuously participate in e-learning activities, and subsequently improve their learning performance and satisfaction towards the taught module.

1.1 Objectives

This study aims:

- to explore the learner's perception on how digital badges affect their online learning experience.
- to find out the impact of digital badges on students' motivation (intrinsic and extrinsic) to participate in online activities.
- to investigate the extent to which design of the badges and learners' attitude toward the digital badges may influence the strength of motivation to participate.

2.0 Context

The sample consisted of 68 undergraduate students who enrolled to the same module offered in Year 1, Semester 2 at Taylor's University, Malaysia. The participants are aged between the range of 18 to 23, with an equal distribution of female (n=34) and male (n=34). The participants have used the university's learning management system (LMS) for more than one month, and tasks were given almost every week

on the LMS for this module. Three digital badges were designed to reward the students who did well in selected tasks based on Bloom's Taxonomy (Bloom et. al., 1956). Also, marks were allocated according to the earned digital badge. To examine whether the use of digital badges influence the learning experience, survey questionnaire was distributed online upon the completion of the module.

Bloom's Taxonomy	Features on the LMS	Badges assigned
Remember	Quiz, Games	 The Novice
Understand	Glossary, Page	
Apply	Lesson, Forum, Questionnaire	 The Practitioner
Analyze	Lesson, Feedback	
Evaluate	Workshop, Forum	 The Expert
Create	Journal	

2.0 Importance of digital badges to education

Applying digital badges in the lesson will promote alternative way of recognizing individual student's achievement. It will also encourage positive behaviour among students. It will make learning more transparent and concrete for students. These digital badges will also motivate students in their learning and will allow them to monitor their own progress, thus will encourage self-pace learning among students.

4.0 Advantages of digital badges towards education and community

With the application of digital badges in the lesson, students have the option to share the badges on social media. This will make students achievement/ skills acquired accessible to potential employers, which will make themselves stand out compared to other students with the similar qualification.

5.0 Commercial value in terms of marketability

The digital badges can be commercialised by formalising it as an alternative to paper certification. Higher Learning Institutions are able to take advantage of it by offer digital badges as part of micro-credentials courses that will be offered to recognize specific skills acquired by the student. To make it more valuable to the students, universities can choose to partner with industries to certify specific skills in demand for that particular industries.

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ID NO. TU006

**TOPIC: GETTING THE TEACHER OUT AND THE PATIENT IN:
EXPERIENTIAL TECHNOLOGY.**

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Abstract: Technology based learning is gaining wide application in the field of medical education. 21st century learners are quick to adapt to device based learning modes. However, the development and refinement of clinical skills essentially requires human/ patient interaction. Simulation and virtual classrooms offer a unique amalgamation of technology aided learning in a more practical and pragmatic fashion. The absence of real human encounter is often cited as a major detriment. And so far online learning has had a limited role in a traditional medical curriculum.

Applications of technology assisted modules that better engage today's learners and at the same time humanize the learning process are the need for the day. The author aimed to provide an authentic and enriching learning experience by humanizing technology assisted learning while focusing on a particular clinical skill in the taught module. A demonstration video with a conversational "doctor-patient" interaction was prepared and posted on TIMeS – the university's online e-learning system. This supported an asynchronous, flexible and student governed access to the "teacher". The primer video not only demonstrated the procedural skill but also incorporated professional conduct and etiquette. The "patient" for actual practice and further accentuation of the skill was in the form of a hands-on simulation system that has profoundly renovated students learning of the retinal diseases by empowering students to actively diagnose real-world eye conditions within a simulated environment. Supervision and immediate feedback enhanced experiential learning.

Key words: *Clinical skills, Ophthalmoscopy, Humanizing Technology.*

Content

As new scientific evidences and clinical data emerge rapidly, continuous professional development and life-long learning become an integral part of the medical career. Modern day medical education also needs constant evolution. The traditional medical curriculum heavily relies on teacher centered educational activities. The very crucial clinical semesters require students to work with real life patients in the hospital setting. This helps develop astute clinical acumen and problem solving ability. Procurement of surgical and interventional dexterity requires hands-on training. These factors have often limited the role of electronic / technology enabled learning in the realm of medical varsities.

At the same time, today's students are very tech savvy and unique in the way they learn, grow and interact with their devices. These learners have had early exposure to the internet and are habituated to the use of web/ technology based learning modules. It becomes prudent that educational stratagem must change to cater to these Gen Z learners.

Clinical skills are more than often demonstrated and taught during Bed-side sessions or using Simulators. Recently, the flipped classroom approach has made inroads into health professions education, and has even been touted "a new paradigm" in medical education. The author used the flipped pedagogical model to redefine in-class activities. A blended (Flip) session with a video (made by the Innovator) along with a "Face-to-face" session proved to be unique and very successful.

An in-house video demonstrating the clinical skill was produced and presented to the learners on TIMeS (the University's online learning- management system). This was to be viewed at a time, place and pace

of the learners' choice before the face-to-face in-class session. Technology thereby helped make "teacher" available at a click. The demonstration video included not just detailed instruction on pre-requisites essential to patient selection and preparation, introduction of the equipment and its use, but also procedural details and steps in the required clinical examination. Patient briefing and professional etiquette/conduct during the patient encounter was underlined and the author took extreme care in presenting to the viewers as a role model. The presentation also covered important aspects of documentation and record of the performed examination and a pictorial discussion on various pathologies/ diseases expected to be diagnosed using the taught skill.

The author was able to explicitly bring out the structure of the topic, elicit an active response from the students and build their declarative knowledge into functional understanding and application during patient evaluation on a daily basis. Such "performances of understanding" are extremely valuable to the procurement of vital clinical skills for trainee doctors. While the demonstration video served to seed propositional/ content concepts and present them in an appropriate and clearly accessible fashion, the in-class interaction helped build and bridge functionality. It not only provided a productive classroom climate for social and collaborative learning but also confronting and eradicating students' misconceptions. Interaction maintained learner interest and delivered personalized learning and reinforcement. A known face, in familiar surroundings as presented in the video helped build a connection and the students related better to the clinical context. This was the quintessential human interface of the web based content.

Technology helped bring the "Patient" into the "In-Class" activity in the form of mannequins and the use of an Ophthalmoscopy Training & Simulation System (OphthoSim™). This is a hands-on simulation system that has profoundly renovated students learning of the retinal diseases by empowering students to actively diagnose real-world eye conditions within a simulated environment. The software includes training and testing modules to practice and evaluate ophthalmoscopy technique with a database of 200 High Resolution Images supplemented with detailed text descriptions and some images are pre-annotated for normal landmarks and pathological features. An easy-to-use "Graphical User Interface" improves viewer retention through an immersive full-screen experience. The land-marking function allowed the instructor to highlight specific characteristics of pathologies in the region student is viewing to enhance student-instruction interactions.

The doctrine of blended learning was used to create an activity that was well specified in the intended learning outcomes, set up a learning environment that encouraged student engagement and performance and eventually helped assess the students' performance against the intended learning outcomes (Constructive alignment within the curriculum). The learner is thus enveloped within a supporting learning system. Transformative reflection adds value to student engagement, curriculum delivery and assessment plan.

This innovative session incorporates multiple aspects of the innovator's teaching learning philosophy. The core concept is to provide a technology-enhanced learning environment and thereby promote On-line learning. The session contributes to the procurement and enhancement of an essential clinical skill and thus augments Discipline Specific Knowledge. The face-to face interaction with the facilitator, peers and patients helps refine Communication Skills and professional conduct/manners (Personal Competencies & Social Competencies). The Clinical discussion that follows promotes Critical Thinking and Problem Solving. Having to correlate with the patients that they see daily in the hospital/wards helps validate the learning – an essential part of Entrepreneurialism. "After the class" discussion (Forum and Bed-side) amplifies Lifelong Learning. The varied nature of the diseases, epidemiological distribution and the impact of blindness on the individual and the society ensures development of a holistic and Global Perspective. A short quiz at the end of the in-class session using a cloud-based student response system and the post class discussions/ reflections continued online as a "Discussion/Forum". This "Flipping the Flip" makes mandatory the use of their own devices in class (BYOD).

The author thus utilizes a multitude of modern pedagogical approaches to present a dynamic, collaborative technology based session that has essential human and social components, thereby successfully humanizing technology.

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ID NO. TU 007
**TOPIC: A SMART Future Classroom in VLE for a Massive
Number of Students: A Solution for Instructor and
Classroom Shortages**
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Abstract: Could classrooms conducted in the Taylor's Integrated Moodle eLearning System (TIMeS) Virtual Learning Environment (VLE) become the solution for instructor and classroom shortages In Taylor's University?– The SMART Future Classroom in VLE using TIMeS has been thought of as the solution to mitigate the lack of large lecture halls to cater for a massive number of learners. The other problem is finding enough instructors to teach the Malaysian National Subjects (MNS), general subjects under the university core modules (UCM) category. For this purpose, a task force was set up, led by the e-Content Development team of the eLearning Academy (eLA) consists of the e-Content Development Specialists (ID), the subject matter experts (SMEs) who some of them will be the course instructors and the relevant stakeholders from eLA and the School of Liberal Arts and Sciences. This team from eLA and SME collaborated on the design and development of the prototype for the 3 MNS courses in TIMeS VLE. How has the team humanized the MOODLE technology in TIMeS to cater to the needs of the learners of the 21st Century and the trends in Edu 4.0? This paper, written from project management point of view, shares the onset design and development processes using SAM2 Model. This paper also shares the preliminary challenges and lesson learned from managing a project of designing and developing fully online courses for a massive number of learners when the lecturers are new to accepting teaching and learning in a fully online mode as the mode of delivery for the course has traditionally been face to face. In refining the learning design, ID's perspectives on the design and development processes were also taken into consideration. This paper highlights the development journey as well as the preliminary design principles which serves as a guideline for other instructional designers or course instructors when developing a course for a massive number of learners in TIMeS VLE.

Key words: *Smart Future Classroom, Massive Target Learners, VLE, Humanizing Technologies, Education 4.0*

Introduction

The rapid innovation in digital technologies enables the delivery of education beyond boundaries. Some of the trends in Education 4.0 is characterized by personalized, anytime and anywhere learning. While conducting a classroom in a fully online virtual reality environment (VLE) is not a new education innovation per se especially in the developed countries, the teaching and learning approach is innovative in the context of Taylor's University (TU). Hence, when an approach is innovative in an organization, a framework to support the design and development process may not be readily available. Several dimensions need to be looked into the design and development processes in designing a fully online course 4.0 as the change of how education is delivered to meet the needs of today's learners will impact not only a private Higher Learning Institution (HEI) like TU. The change will also impact its educators as with the e-Content Development Specialist (ID) from the eLearning Academy (eLA) who will assist the transformation to take place.

Background

In 2017, TU began the steps for transforming how education is delivered to its learners. First, to remain a 'top choice' private learning institution, TU needs to remain relevant to its customers. TU's customers - the 21st Century Learners will be enjoying a new curriculum structure under the Taylor's



Curriculum Framework (TCF) ("New curriculum structure - Education | The Star Online," 2018). Secondly, plans have unfolded for Taylor's College (TC) to move into the Taylor's University campus grounds by 2018. TC shall largely occupy most of Block E of Taylor's University. With all these changes happening in TU, the management needs to change their game plan of delivering quality teaching and learning to its students. With two units of HEIs occupying the campus grounds, the issue of lack of space must be mitigated. With Education 4.0 mode of delivery allows personalized and anytime and anywhere learning, this means online delivery is being thought of as one of the mode of education delivery and will become a forefront of Taylor's pedagogy.

The transformation of TU's pedagogy happens in phases under the TCF. The first courses to undergo this experimental change orchestrated from top down are the Malaysian National Subject (MNS) courses, the General Subject course under the University Core Modules (UCM). The decision for the MNS courses to become the first few courses to transform its mode of teaching and learning in a fully online mode is no longer a choice, but a necessity in TU. The nature of the MNS courses taken by a massive number of students each semester and with the lack of space on campus and teaching staff made these subjects the first courses to pilot the fully online courses in TIMeS as smart future classroom in a virtual learning environment (VLE) or referred to as TIMeS VLE. Hence, there is also a need to repurposing TIMeS VLE to ensure it is up to date with the trends in Education 4.0. To adapt with the current trends in education as with the change in the tools of delivering online education, a design and development approach is adapted in the development of the MNS course prototype in TIMeS VLE.

The Description of Product

The fully online MNS courses, Malaysian Studies 3, Pengajian Malaysia 2 and Pengajian Malaysia 3 are the three General Studies under the University Core Module (UCM), compulsory to be taken by all students who are taking undergraduate degree from a Malaysian HEI. The objectives of the MNS, UCM courses are to provide holistic education with an appreciation of values and history of Malaysia as well as broadening the knowledge of Malaysia. Starting March 2018, these 3 MNS courses are offered as fully online in TIMeS VLE to cater to a massive number of TU students. The courses are run as participatory online course, where student's activities are collaborative and course instructors are expected to be highly engaged with students, as with student to student in peer to peer engagement. Each course runs for 14 weeks with online task-based continuous assessment worth 40% of the assessment component conducted in journal, forum and Wiki. Parts of the online tasks are also turned into challenge-based tasks. Students are also required to submit a final group project worth 30% of the assessment component by the end of the semester. The classes meet for the first time face-to-face on campus, with the remaining 14 weeks conducted fully online. At the end of the semester, students are required to take a summative exam worth 30% of the assessment component.

The Model Used for the Development of the Courses

The Successive Approximation Model 2 (SAM2), a fast, agile and collaborative model is the instructional design model adapted for the design and development of the 3 MNS courses. SAM2 is chosen as the design and development ID model as the development of the 3 MNS courses require developing complex learning materials such as interactive learning object using Articulate Rise and 360 as well as the development of learning resources using interactive video tools, all through gamifying the course in the final stage. The iterative process of SAM2 allows repetition of a process or a stage as the prototypes are continued to be built upon and improve in each repetition testing the newly added learning objects relevant to Education 4.0. There are four stages to SAM2 for course development. The process starts by evaluate on the requirements of the project in preparatory stage, then move into the design of the blueprint of the course, then develop, evaluate and ends with rollout. The design and development process is being done in several development stages and ends with several versions of prototypes, to allow the courses to be developed organically yet fast without putting too much pressure on the course instructors who consists of lecturers with different adoption rate of technology.

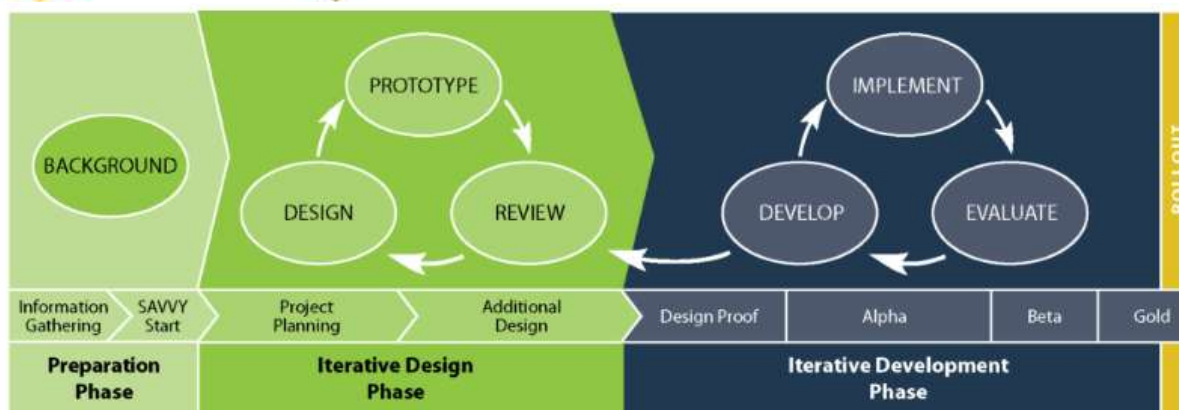


Figure 1: SAM2 the agile ID model which allows a course to be developed fast and collaborative manner between the course designers and the SMEs.

Pedagogical Design Approach

The course is structured in a relaxed and easy going manner at the start of the course. Ephebagogy pedagogical approach is adopted at the onset of the course. Ephebagogy is a teaching method for educating students in a transition period from childhood to adulthood, between 18 to 24 years of age (Flowers, 2014). Typically this is the age where most undergraduate students in Malaysia fit. Using this approach, student's transition to TIMeS VLE is scaffold with a face-to-face meet up at the start of the semester with the course instructors giving clear instruction on course expectation and the ground rules of the online course. Communications via the chat app Telegram is also incorporated into TIMeS VLE to further support the student's adoption to TIMeS VLE. In the first two weeks of course instructors will continually encourage students to make post by heavily engaging and responding to student's posts. Course instructors are encouraged to use emoticons available in TIMeS VLE to communicate their thoughts on the students' posts with an emotion. In turn students are also encouraged to do the same. Explicit instruction is given to students in TIMeS VLE in the earlier part of the course. As students gain more confidence in their virtual learning environment, the course instructors will slowly move to the role as facilitators of the learning process. The approach is content based learning by adopting weekly task-based activities. The Heutagogy pedagogical approach where students can be more self-directed through challenge-based activities can be introduced by the ID team to the course instructors after they themselves are comfortable in managing their courses in TIMeS VLE. As the course instructors consist of different adoption rate to technology, the change in pedagogy approach is also done in stages. The course instructors must first accept and adapt teaching and engaging with students online and managing their course in the new TIMeS VLE before any other pedagogical approaches or new engaging tools can be introduced.

Material and Method

The MNS courses have similar content but each of the MNS courses differs from each other by the depths of content being taught as well as the types of activities and project conducted. The structure of the course content is byte size learning with instructional video serves as the main learning resource is edited to be not more than seven minutes per video. Class tutorials are conducted synchronously using YouTube Live and OBS software as the interface that can enable live chat to be recorded. Lecture notes are enhanced making use of infographic to display learning content in a simple yet attractive manner. Wiki is being used as a collaborative platform for group discussion. The learning design focus is on the learning experience of the learners rather than from a purely instructional design or the course instructor point of view. The learners' feedback are also sought by the end of the course as learner's feedback is also an integral part of course development. Forum is highly used to engage with students with weekly tasks given to scaffold students' learning. Journal activity is presented to students as a form of self-

reflection after a large part of the topics being taught. The structure of the questions is set to challenge students to apply the knowledge gain in a real life situation in the present. Peer-to peer (P2P) assessment is being used in certain class activities such as forum and workshop. P2P assessment empowers students to take part in the assessment process of the course. Student A gave feedback on P2P assessment as "It helps us to build and share our thoughts and ideas together" while Student B informs " . . . they will learn from one another and at the same time enhancing student's critical thinking skills". Student C confirms by saying "Yes. It will help student to learn by accessing their peer". Digital badges are being used as markers of learning milestones in the early prototypes, though for the later prototype version, student's competency is measured by the digital badge earned. Gamification element is added into the learning using level up plug-in which allow each learning objects to carry certain points of completion marks. Again, gamification using level up can only be utilized once the course instructors are comfortable and competent in managing their classroom in their new smart future classroom in the virtual online environment.

Value Added

Teaching MNS courses in TIMeS VLE provides a solution for TU with regards to insufficient classroom space. This method can be used by other HEI which uses Moodle as its LMS. By offering courses online, students can learn at their own pace and with the availability of TIMeS VLE app, the MNS can be access anytime and anywhere. Utilizing Telegram as its main mode of communication allows for rapid information sharing among course instructor and students as with students with their peers. By providing learning in VLE, content can be recycled by course instructors as they see fit and along the way more activities can be co-curated to assist student's learning. The experiment with badging enables competence to be awarded using digital badging.

Crucial Success Factors

The involvement of the eLA's eContent Development team serves as a crucial success factor to ensure the transformation of the face-to-face classroom to its smart virtual environment in TIMeS can happen timely by March 2018 semester. The eLA Content Development team also ensures that the course instructor's transition to teaching in TIMeS VLE is scaffold by offering training in the onset of the project with an eLearning expert in online pedagogies as well as using TIMeS. Course instructor's engagement with students are also monitored in TIMeS VLE as with the chat trail in Telegram. The conduct of a participatory course is highly dependent on instructor to student engagement. In the start of the online class, the course instructors must ensure students are engaged and feel welcome in TIMeS VLE before they slowly step aside and become the facilitator of learning and let the students gain control of their learning in TIMeS VLE.

Challenges and Lesson Learned

The vision that inspires the learning design for Education 4.0 by the Lead eContent Development Specialist and her team may not initially be aligned with the course instructor's take on how the course is best conducted, especially since the course instructors have never taught a fully online course before. However, with the experimental class running in several prototype versions, late adopters to technology stand a chance to have a first-hand experience in teaching the course in TIMeS VLE. With the guidance from the eContent Development Specialist team, this allows the course instructors to adapt in their new VLE in a safe yet agile manner. The course instructors are given continuous support by the eLA team in form of consultations after the rollout stage to overcome their shortcomings and until they are confident to manage their classes in TIMeS VLE on their own. In assisting the late adopters to technology to transform, the notion that support is given is very important. The eLA team provided full support throughout the design and development processes. Consultations on course support are also given via Whatsapp or Telegram messaging service. The course instructors are also informed that they will be receiving continued support from eLA even after the development project for a project cycle has ended.

Novelty and Commercialization Potential

Although conducting a fully online course is not something new and has been around since the 90's, a fully online course that meets the standard and trends for Education 4.0 is still largely experimental. The question of how would the educators teach in Education 4.0 leaves room to be answered. How would the course be structured for Education 4.0? What new e-learning tools can be plugged-into TImeS? Can Moodle (TImeS VLE) still be relevant as a learning management system (LMS) platform for Education 4.0? The case study in TU will share learning design principles which will be used to guide lecturers on how to design and develop their courses in a Moodle platform for Education 4.0. This learning design principles will in turn be developed into a learning design framework for developing a fully online course for a large number of learners that meet the requirements of Education 4.0. If done right, the courses under this project can be offered as a product to learners outside of TU as credit transfer MOOC.

Acknowledgement

The author would like to express gratitude to the School of Liberal Arts lecturers especially to the SMEs who are involved in this project. Special thanks to Mr. Lim Chee Leong, Director of eLA for his support and to the eLA team members for their collaboration in this design experiment as well as the TRGS/ERFS for the funding received for this project. The author is a Research Associate for the Centre for Future Learning, in Taylor's University, Malaysia.

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ID NO. TU008
TOPIC: SCORM: A Real-world e-Learning Activity for Self-Assessment
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Abstract:

Self-assessment is an important entity in learning, which provides numerous benefits to the learner. In this innovation, a Sharable Content Object Reference Model (SCORM) has been embedded into one of the module sites in Taylor's University Learning Management System (Moodle) called TIMeS as an e-Learning activity for self-assessment. The production process of this SCORM includes: 1) Discussion between Subject Matter Expert (SME) and e-Content Developer on the topic to be highlighted for conversion into an interactive learning object. The chosen topic was 'Nutrition Care Process' because it is the foundation for the module and a major topic in the mid-semester examination; 2) SME provides a structure for the SCORM content; 3) e-Content Developer reviews the structure and discusses with SME on the types of interactivity to be included in the SCORM; 4) The SCORM is embedded into the module site in hidden mode for testing and for further amendments to make it user-friendly; and 5) The SCORM is switched into "visible" mode for blended learning. The developed SCORM is a humanising technology because it includes: 1) The implementation of the interactive drag-and-drop activities which resemble the way real people work in organising or selecting content; 2) Words of compliments/encouragement after completion of each activity; and 3) two attempts in each activity which allows a second chance. These humanising elements mimic the face-to-face instructor approach. Students liked the SCORM/e-Learning self-assessment as the module was rated Top 3 most active modules in addition to better grasp of the topic evidenced in assessments.

Key words: SCORM; self-assessment; e-Learning; humanising technologies; nutrition

Content:
The Description and Design Process

As the technology advances in the field of education, many instructors have turned their learning method from teaching in a face-to-face classroom into a blended learning or a fully online environment. As for this innovation, a Sharable Content Object Reference Model (SCORM) package has been chosen to be a part of the learning object in Applied Nutrition module as blended learning. The development of this SCORM package is based on one of the most known instructional model, SAM1, which stands for Successive Approximation Model. This model shows an agile development, which was created by Michael Allen, whom pioneered the design of interactive multimedia learning tools and applications (Essel, Mension, & Yeboah, 2016). SAM1 involves starting the project by analysing, designing, developing, and then return to analysing again in a repetitive process until its completion (Figure 1).



Figure 2. SAM1 model. Retrieved from <https://community.articulate.com/articles/an-introduction-to-sam-for-instructional-designers>

By using this Successive Approximation approach, which is flexible and suitable for small projects, the idea could be shared as quickly as possible before the creation of a prototype of the SCORM that actually worked. Then, before the lesson began, students and SME participated in the evaluation process in order to add value through new ideas to improve the SCORM.

Background

There are three (3) objectives in this innovation: 1) to develop an interactive learning tool using SCORM for self-assessment; 2) to incorporate humanising elements into the developed SCORM; and 3) to assess the benefits of the developed SCORM. In this SCORM package for Applied Nutrition module, SME has chosen to expand the lesson for Nutrition Care Process topic as blended learning. In the initial phase of the process, SME has discussed with the e-Content Specialist on the topic to be highlighted for conversion into an interactive learning object. Applied Nutrition module has 14 topics altogether and during this analysing process, 'Nutrition Care Process' which is one of the topics in the module has been chosen to be highlighted and taken online as it is the foundation topic for the module and a major topic in the mid-semester examination. After this analysing process, SME has provided a structure for the SCORM content to be reviewed by the e-Content Specialist before the designing process began. During the designing process, the e-Content Specialist has taken some consideration to design the SCORM package based on the characteristics of the module itself. For example, images of healthy foods such as fruits and vegetables have been chosen to be the background image of the SCORM package to suit the word 'Nutrition', the use of cheerful colours in the SCORM to attract students to attempt the learning object as well as the easy-to-navigate design for students to just click and go to the next activities in the lesson. The main objective of the implementations of these elements are to ensure that the SCORM package can visually communicate its content to the students. Then, during the development process, several types of interactivity to be included in the SCORM have been analysed and developed in order to create a humanised interactive learning object. This process involved the implementation of the interactive drag-and-drop activities, which resembles the way real people work in organising or selecting content. Drag-and-drop action has changed the way users interact with computers as people are able to express their attention just through a gesture or a hand-movement, and it also increases the accessibility chances of various users through different devices (Kouroupetroglo, 2014). In this case, by using this SCORM, students will be able to complete some of the self-assessment activities just through a gesture of drag-and-drop activities which can be completed by using desktops or mobile devices. The next humanised element in this SCORM is the words of compliments or encouragement that the students receive after the completion of each activity. This may give the students a motivation to move forward and complete all of the activities provided in the SCORM package. Besides, each activity provided in the SCORM package also allows two attempts to the students and this gives them a chance to rethink of their choice and retry before getting the correct answers. After the development phase, the SCORM is embedded into the module site in hidden mode for testing and for further amendments and this process will go back to the analysing phase where SME analyse and evaluate the developed SCORM package to make sure that it is working and user-friendly. Once the cycle is complete, the SCORM is then switched into the "visible" mode for blended learning and students' feedback were taken.

Advantages and importance in education

A brief feedback form was disseminated to the students at the end of semester in order to assess the benefits of the developed SCORM. This can also help in providing information on the advantages of the SCORM package. The online feedback form included the following:

- 1) Four (4) items using 5-point Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) which are: a) 'The interactive SCORM helped you to understand the topic better'; b) 'The instructions provided in this SCORM can be easily understood and help you to navigate through the lesson'; c) 'The activities provided in this SCORM help you to do self-assessment on the topic'; and d) 'Do you think the SCORM activity is useful for revision before midterm exam?'
- 2) One (1) item with a 5-point scale from very good, good, neutral, bad and very bad for 'Rate the design and the structure of the SCORM'.
- 3) One (1) item which is 'Would you like to have more SCORM activities on different topics of the module?' with the options, Yes, Maybe and No.
- 4) One (1) open-ended item in which students provide comments about the SCORM package.

Results on the feedbacks from the students f (N=18) on the items using the 5-point Likert scale are shown in Table 1. Overall, almost all of the students (95%) agreed that the SCORM package provided several advantages such as understanding of the topic and usefulness for self-assessment and revision before the examination. These quantitative results are also consistent with the comments provided by the students. Some of the comments are "SCORM is a good learning system that helps me to refresh my memories towards the module taught in class", "SCORM is an excellent tool for revision. It provides immediate feedback which I found very helpful", "The interactive method makes it easier for me to remember, understand and apply what I have learnt", and "In the overall, SCORM provide us an interesting way to do the revision". These advantages of the SCORM package are very important in education as they constitute the learning process of the students.

Table 1: Feedback from students by percentage on the SCORM package

Item	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
1. Understanding of the topic	56	39	5	0	0
2. Instructions and navigation easy to follow	61	33	6	0	0
3. Help in self-assessment	56	39	5	0	0
4. Useful for revision before examination	56	39	5	0	0

In addition, other advantages of the SCORM package include 94% of the students agreed that instructions provided in the SCORM e-Learning activity was easy to understand and the navigation in each step was easy to follow. Majority of the students (83%) also rated the design and the structure of the SCORM as very good or good and the same percentage of students indicated they would like to have more SCORM activities on different topics of the module. One student commented, "I think it is a fun way to engage students to answer questions based on their knowledge that way and not in black and white. It is more colourful and it made me happier and more excited to do it if compared to just black and white written revision". In summary, the developed SCORM package has provided several advantages in terms of learning for the students due to its humanising elements. This is further shown as the module was rated Top 3 most active modules and 100% passing rate for the examinations.

Commercial Value

The advantage of a SCORM package depends on its interoperability because in order for an online learning object to be used efficiently and for an institution to preserve its digital learning material, the developed learning object needs to be able to integrate into a Learning Management System (LMS). SCORM allows integration to occur seamlessly and simply (Rustici Software, 2018), thus, the creation of this SCORM will attract more educators in the same field to integrate it into their module sites in the university's LMS. This will enable content sharing among instructors inside the university and can also be commercialised to other learning institutions. Hiring vendors to create a SCORM package can be costly



and time-consuming, hence creating this SCORM package can add to the existing SCORM library in the university and this may save the cost and time for the university as well as can be shared to other higher institutions to be used by similar faculties. With the increasing number of blended learning and 100% online learning in higher learning institutions, creating such SCORMs could attract more students to be interested in the topic taught. Besides integrating the SCORM in the internal university's LMS, it can also be embedded into external MOOC platforms for the benefits of the students in the field.

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ID NO. TU009	TOPIC: Bridging the Gaps between Learners through Computer-supported Collaborative Learning (CSCL)

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Abstract: Teaching learners with diversities of intelligence, motivation, learning styles, and cognitive requirements is a common challenge for educators. Although there is an increasing popularity in blended learning in recent years, learners who are hesitant and less motivated are often left behind even in collaborative assignments when compared to their peers. This study incorporated computer-supported collaborative learning (CSCL) platform, specifically LiveBoard, as a motivating and supportive learning system during problem-based learning through the use of teaching technology. Current study revealed that CSCL platform effectively bridged the communication gaps among fast, moderate and slow learners, and provided them equal sharing and learning opportunities. It enabled effective collaborations among learners, and motivated learners of all types to contextualize learning within their learning experience, at their own pace, anytime, anywhere.

Key words: *Computer-supported Collaborative Learning, Interactive Whiteboard, Humanizing Technologies*

Content

Globalized Online Learning is one of the 10 shifts outlined in the Malaysia Higher Education Blueprint 2015-2025 that will spur continued excellence in the higher education system (Ministry of Education Malaysia, 2015). Blended learning models will become a staple pedagogical approach in all higher learning institutes (HLIs). However, learners who are hesitant and less motivated when associating learning with information and communication technologies (ICT) may be left behind when compared to their peers. These learners who are often slow learners become demotivated and lost interest when they are unable to cope with learning content. Fast learners on the other hand would get bored if the content is less challenging to them (Raji, 2015). Hence, teaching learners with diversities of intelligence, motivation, learning styles and cognitive requirements remains a common challenge to educators.

As quoted by Ignacio Estrada, "if the child can't learn the way we teach, maybe we should teach they way they learn". Current study established a motivating and supportive learning system through humanising technology. Computer-supported Collaborative Learning (CSCL) platform, specifically LiveBoard, which combines instant messaging, handwriting recognition, image sharing, recording and storing of information was used to enable group discussion and peer tutoring among learners anytime, anywhere. Students were assigned into learning groups, each comprised of slow, moderate and fast learners, and worked collaboratively using LiveBoard in problem-based learning. Educator could facilitate and encourage engagement at any point to provide a supportive learning environment to all learners.

Current results showed that 84% of the students preferred collaborative learning because they could learn from their peers and support each other in the learning process. Majority of the students at the Anatomy and Physiology II module [73.4%; Figure 1 (a)] and the Human Molecular Genetics module [70.8%; Figure 1 (b)] enjoyed using Liveboard as their collaborative learning platform because they had equal information sharing and learning opportunities. This promotes a supportive peer-assisted learning environment which can be as efficient as support from the educator. Students found LiveBoard an effective revision tool with its recording and cloud storage functions, making their learning more versatile, fun and convenient. Interactive learning via LiveBoard also enabled learners hone their social skills, responsibility communication skills and language skills.

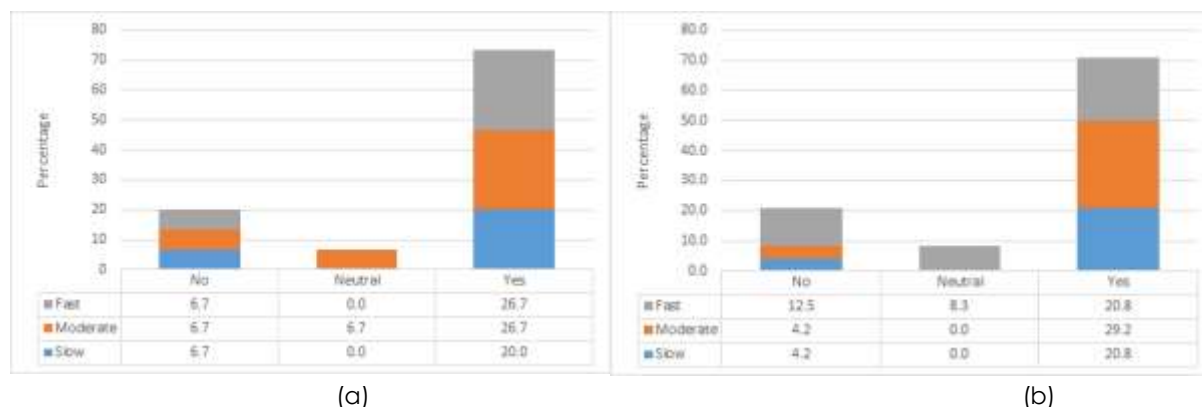


Figure 1. Usefulness of LiveBoard as revision tool among different types of learners in (a) Anatomy and Physiology II module (n = 15) and (b) Human Molecular Genetics module (n = 24)

Motivating and supportive learning environment is crucial in education to cultivate self-directed life-long learners. The embedment of LiveBoard as a blended learning tool in the current research setting is well aligned with the Malaysia Higher Education Blueprint 2015-2025, which requires up to 70% of programmes to use blended learning models (Ministry of Education Malaysia, 2015). LiveBoard is able to bridge the communication gap among learners and promotes active student-centered learning by providing equal opportunities to participate in learning activities. Students are motivated and continue to be actively engaged in the learning process. LiveBoard is also an effective remedial teaching platform which supports learners, especially the slow learners. Slow learners are able to work towards a common goal with their peers, and thus foster self-esteem and sense of socially acknowledged in their learning process (El-Dawa and Hammouda, 2015). Corrective feedback and modified learning content that slow learners receive from peer tutoring through CSCL platform help to enhance their understanding and learning capability. Alongside, fast and moderate learners also benefit with their enhanced assimilation of the knowledge through sharing.

Collaborative learning through humanizing technology (i.e. LiveBoard) in current study helps learners to shift their attention from the software, enabling them to contextualize learning within their learning experience. It also provides learners more flexibility in learning time and encourage collaborations at their own pace as compared to educator-directed activities. Enriched student learning experience via collaborative learning is also in line with the Taylor's Curriculum Framework (TCF), which aims to prepare future-proof graduates who are equipped with Taylor's Graduate Capabilities (specifically communication skills, critical thinking and problem solving, lifelong learning, personal competencies and social competencies) and are ready for the 4th Industrial Revolution (Taylor's University, 2018).

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TU010	TOPIC: Improving Logical Thinking Skills using Jigsaw-based Cooperative Learning Approach through Collaborative Learning Systems

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Abstract: Logical thinking skills are one of the crucial factors that determine the capability of learning programming among students in Computer Science studies. One of the learning method to instil such logical thinking skills on Computer Science students is using Jigsaw-based cooperative learning. This learning method is essential to improve and build logical thinking skills among students in the programming courses. Six key features of Jigsaw-based cooperative learning have been identified that successfully promote logical thinking skills and learning processes among students. There are (1) *positive-interdependence* among group members; (2) *active face-to-face verbal interaction* to elaborate and link new learning material to previously learned facts and concepts; (3) *responsibility* for the learning that demand *individual accountability*; (4) *social skills* that allow students to function efficiently and effectively via trust-building, communication and leadership skills; (5) *group processing* that requires members in the group to periodically assess their works, and (6) *appropriate grouping* by the facilitator to ensure that each group contains members with various attributes to strengthen problem-solving and social skills building. These six features are considered essential and helpful for students to achieve common learning goals. To better support, supplement and further enhance the logical thinking skills of the students, online collaborative learning systems are needed. Examples of online collaborative learning systems are code-sharing platform (e.g. CodeShare.io), online software development platform (e.g. GitHub) and idea sharing board (e.g. Padlet). A pilot test was conducted in a programming module. The experiment has shown that the introduction of such online collaborative learning systems has made the teaching and learning process more engaging and dynamic.

Key words: *logical thinking skill, problem-solving skill, cooperative learning, learn programming.*

Content

In the past years, the demand for software development has increased rapidly in Malaysia (Hay, 2018). Skilled software developers are often needed to meet the job demand. This phenomenon has encouraged many people to learn programming. However, teaching programming is always a challenge for most of the instructors in the university setting. Particularly to instill problem-solving and logical thinking skills at open-ended programming problems. This has led to high failure rates and dropout in most of the Computer Science Studies (Lahtinen et.al, 2005, Othman, Hussain, & Nikman, 2017).

Many studies have examined cooperative learning in the university setting to help students in their studies. They have shown that cooperative learning is an effective learning approach than those associated with other instructional methods (Huang, Liao, Huang, & Chen, 2014; Johnson & Johnson, 1990; Sharan, 1990; Slavin, 1995; Lin, Huang, & Cheng, 2010). This is because learning groups in cooperative learning approach has successfully promote active learning among members through social interactions and discussions among the group members. In addition, before the learning takes place, instructors can carefully design and arrange the module and provide the professional knowledge and guidance needed by the students. This learning approach also allows students to jointly achieve a common goal through the division of tasks. Hence, making the students to learn to share responsibilities and knowledge via social interaction. Building from such fundamentals skills, they will learn to convey their understanding of certain concepts together and assist each other.

This study adopted Jigsaw-based Cooperative Learning approach using Collaborative Learning Systems. The objectives of using this learning approach with Collaborative Learning Systems are: (1) to access the

suitability of Jigsaw-based cooperative learning in teaching programming course, and (2) to improve logical thinking skills among the students in the programming course. We believe that the six key features of Jigsaw-based cooperative learning, namely: (1) positive-interdependence; (2) active face-to-face verbal interaction; (3) individual accountability; (4) social skills; (5) group processing, and (6) appropriate grouping, could improve and strengthen the student's problem-solving and logical thinking skills.

In the experimental study, we have conducted a pilot test on Jigsaw-based Cooperative Learning approach using Collaborative Learning Systems in a programming module called Object-Oriented Programming. This pilot test has involved 18 students from Diploma in Information Technology. The logical thinking and problem-solving skills were examined in two different assessment components. We first assessed the students' logical thinking and problem-solving skills in the first assignment and re-accessed them in their second assignment. Jigsaw-based cooperative learning with online collaboration tools (e.g. Eclipse, CodeShare, GitHub and Padlet) were applied in the second assignment. Both of the assessments were marked as continuous assessment as part of the coursework. The results have shown that by applying the learning approach and collaborative tools 55.6% of students have significantly improved their logical thinking and problem-solving skills in the second assessment. At the end of the final assessment, 17 students have passed the module and 4 students have achieved grade A. We also receive positive feedback from the students.

We see a potential of commercialize the monitoring tool. The reason is because there are at least four different online collaboration tools involved in this learning approach. If we could develop a one-stop monitoring platform that could assist the instructor then the instructor can better guide the students' progression.

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ID NO. TU011
TOPIC: Humanizing the Technology through Redefining Authentic Learning Environment in a Simulation-Driven World
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Abstract

With the explosion of recent Web 4.0 and emerging technologies have increased opportunities for educators to create student-centered learning environments that foster the development of 21st century graduate capabilities and Industrial Revolution (IR) 4.0 competencies skills. The evolving use of educational simulations have received special attention in number of disciplines towards the paradigm shift in the teaching and learning approach. Simulations create a scenario-based environment whereby the students apply their previous acquired knowledge and skills to real-world problems created by the teachers to reach their own goals at the end of the simulations. The students learning journey during the hospitality simulation challenges them to develop interpersonal, analytical and creative skills as they have make decisions to position and retain their hotel position. This also engage students in the interactive, authentic and self-driven acquisition of knowledge which is much adopted in higher education. The simulation enabled students to build pivotal capabilities such as management abilities and team working to enable the success of future managers. The use of simulations supports an experiential learning paradigm as described by Kolb's model four step process of experimentation, experience, observation and conceptualisation of students concepts and ideas. It is evident that the simulations can be viewed as powerful teaching tools in promotion teamwork, collaboration, social and emotional skills and other soft skills such as project management, self-reflection and leadership skills which are acquired through a reality-based scenarios with action-oriented activities. The simulation also have the potential to work as an effective substitute for real experiential contexts by providing students with an redesigned authentic learning environment to humanize the technology effectively. The simulation in an educational context should create an immersive environment that facilitates increased activity and student engagement.

Key words: *Simulation, humanizing technology, authentic learning environment, 21st Century skills*

Description of innovation / product development / design / process.

As a higher education facilitator, I always think that the way of delivery should be redesigned with new teaching and learning pedagogical approach whenever there is changes in the generation among the learner's community. My teaching passion is to engage, collaborative and inspire my students inside and also outside my classroom environment and recently I got the opportunity to teach the final year bachelor degree students by integrating the educational simulation whereby it broadens the students understanding on the business functionalities of hospitality industry from top management and executives level. The simulation integrated teaching also enables the students to run the hospitality business with peers as competitors to develop the 21st century global competency skills and well understanding of the hospitality business model. The variety of these interactions among the peers and comparing their business performance, feedbacks from the lecturer and peers as stakeholders during the business performance presentations that can be used to check comprehension and business skills.

The context or background of the innovation / product development / design / process

- It allows the students to apply their learning experience into simulated business environment for expanding their knowledge beyond the walls of the classroom
- It provides an opportunity for students to collaborate with peers and make various decisions as individual and team to run their business successfully among competitors and keep their hotel in top priority ranking status.
- It supports a social constructivist view of learning because it enhances students' ability to apply their previous learning experience into real business simulated world and understand the practical consequences involved in the decision making in the hospitality business.



- The flexibility for students to learn, engage and connect through simulated software with their peers anywhere through humanizing the technology to redesign the educational process.
- The simulated classroom shifts the learning space into real business situation environment.

Its importance to education

- Bring the real business experience into the classroom
- Increasing business and industrial revolution 4.0 Competence skills
- Bridging the curriculum and industry through humanizing the technology
- Create a simulated-driven learning space to develop the entrepreneurial and managerial skills

Advantages of innovation / product development / design / process towards education and community.

- Bridging the curriculum and technology
- Enable participation for students outside of the classroom
- It benefits the students to understand the ability of hospitality simulation in transferring theory into practice
- To apply their multi-skill sets in uncertainties business scenario and managing the hotel business in realistic situation.
- It creates a business phenomenon whereby the students need to carefully analyse their performance to make various decision-making to achieve their forecast with their strategic planning and development process.
- It broadens their understanding on impact of decision-making on various aspects in the business performance.

Commercial value in terms of marketability or profitability of your innovation / product development / design / process.

- Builds a stronger relationship with educator and learners globally
- Research cluster opportunities between other institutions and industry
- Open Learning Community – Life-long learning
- Exposure to the International business model
- Developing training content for hospitality staff development programs

Acknowledgement

We are entirely grateful to the immense and continuous motivation from the Faculty of Hospitality, Food and Leisure Management and the intensive support from the e-Learning (eLA) department of Taylor's University.

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ID NO. TU012	TOPIC: ENGAGING MULTIMODAL LEARNING STYLES THROUGH PROJECT-BASED LEARNING

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Abstract: In education, it is often a challenge to advocate equal learning opportunities for learners with different learning styles (as modelled by Neil Fleming's VARK model). Compared to designing lessons that tailored towards particular learning styles, engaging the multimodal dimensions of the VARK could positively impact engagement and knowledge retention. Contrasting ideas on how many learning styles exists and the classification of learners according to these styles are common disputes that can be addressed by promoting learning opportunities that accommodate the full spectrum. In the Foundation in Engineering programme in Taylor's University two projects, Roborace 1 and 2, are such as presentation, video-making, e-quizzes and robot-building require different modes of responses that correspond to the multimodal styles in the VARK model. Supporting the notion of digitized learning, a variety of web-based platforms such as Arduino web editor, online 3D design and Google Drive are used to facilitate these projects. Findings from surveys and interviews indicate that involving a spectrum of learning styles in these projects increases the level of student engagement. Assessment results also show that students perform better compared to the other modules as a result of better knowledge retention. Overall, the projects and the supporting applications humanize technology through building a learning community that emphasizes on collaborative efforts and multimodal communication. With these initiatives, it can be concluded that engaging a spectrum of learning styles help develop meaningful and enduring learning experiences compared to personalized learning that capitalizes on a particular mode of learning which is often solitary and unengaging.

Key words: *Project-based learning, Multimodal Learning, VARK model, Engagement, Knowledge retention.*

Content

Project-based learning

Project-based learning (PBL) is a developed instructional strategy grounded in the Kilpatrick (1918) and Dewey (1938)'s project method. Two educational theorists, Kilpatrick (1918) and Dewey (1938), defined students as active investigators, not passive recipients in the learning process, representing radical constructivism in mathematics and science education (Han et. al., 2014). According to Larmer et. al. (2015), PBL is a powerful approach that motivates students while preparing them for careers and citizenship. In this approach students gain knowledge and skills by working for an extended period of time to investigate and respond to a complex, real world question, problem, or challenge. It engages students in deep thinking while connecting their learning in the classroom to the world around them. With the focus



on developing 21st century skills in students, PBL employs an active student-centred form of instruction which is characterised by students' autonomy, constructive investigations, goal-setting, collaboration, communication and reflection within real-world practices (Kokotsaki, Menzies & Wiggins, 2016).

When implementing a PBL strategy, it is important to consider the diversity of learning styles among learners so as to create a more balanced opportunities for all. According to Neil Fleming's Visual, Aural, Read/write, and Kinesthetic (VARK) framework, most learners are multimodal instead of having one dominant sensory modality. Hence, educators need to be wary of the strategies they use for prolonged engagement.

Context and implementation

This project was implemented in the Foundation in Engineering programme in Taylor's University to engage and assist student with different learning styles to learn engineering design and project management. In order to correctly reflect the diversity of learning styles in the classroom, the authors have adopted the VARK model developed by Neil Fleming [1] in a pre-commencement survey. Neil Fleming and David Baume, in their recent article published in 2006 [2], have suggested that student learning are made up of Visual-based, Audio-based, Read & Write-based and Kinesthetic-based styles. In the same article, Fleming and Baume have also pointed out that there is a possibility of multimodal learning styles. In this report, the authors will share their experience in enhancing engagement with multimodal learning styles in the classroom.

1. Learning Styles Survey using Neil Flaming's VARK model.

Prior to the start of the project-based module, student was required to take a survey to link their learning styles preferences to the learning styles as prescribed in the VARK model. The survey was adopted from the VARK-learn.com [3]. The student will be able to view the survey result right after the survey. This by itself will help them to get to know to their own learning styles and have the right strategy for better learning effectiveness.

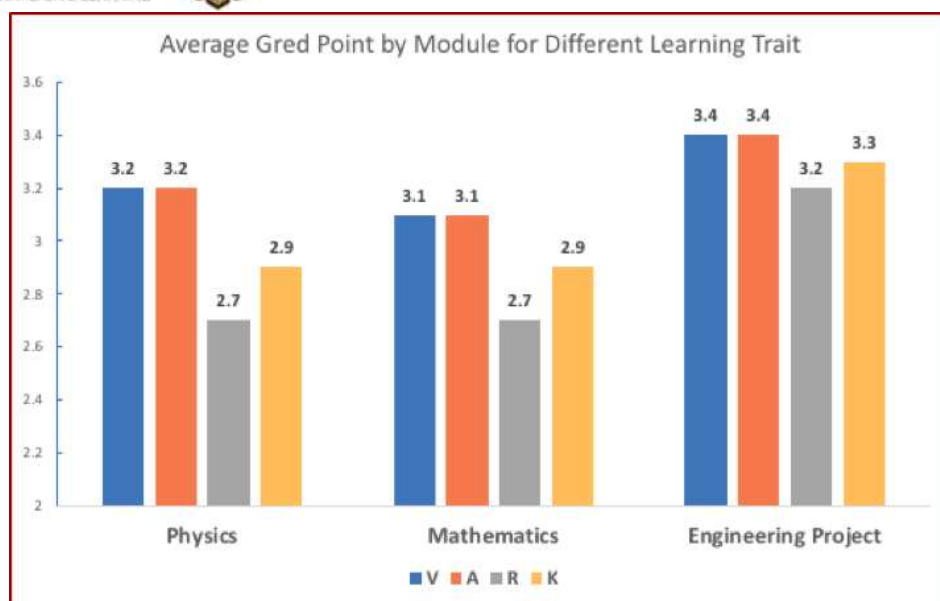
2. Engineering Project - RoboRace tailored for Multimodal Learning Styles in a classroom

Aware that the class have a diverse learning styles, the programme have tailored a module that will allowed student with different learning styles preference to learn equally. This was done through PBL strategy whereby student learn engineering design and project management to solve complicated engineering challenges through various learning activities. Namely, lectures (VA), e-quizzes (RK), group discussion (K), presentation (VAK), video making (VAK) and Artifact Presentation (VK). A point to note is that the project is to be done in a group of 4-5 students per group. The key to the success of implementing this project is by ensuring each group consist of fair distribution of learning styles preference.

Significance

1. Average Grade Point Comparison by Module for Different Learning Trait

Through various assessment methods at periodically throughout the semester, the authors are able to gauge the knowledge attainment in students and it is reflected on their grade point for the module. Figure 1 shows the knowledge attainment in student with different dominance learning styles.



The project-based module showing overall higher attainment and fairer grade distribution among other STEM modules.

2. Apply Ideas to Reality through Collaborative Learning

Through these PBL activities, student learnt from the module coordinator and as well as from their classmate. Collaboration within the team and across teams promote ideation process and lead to solution for engineering challenges in real world. Furthermore, by having students with different learning styles preference in a team, learning process was more fun and productive.

3. Recognition and Awards

The authors have presented the project in several competition at national and international levels. They have reported on the incorporation of Emotional Intelligence in PBL module, noting the variation in learning styles preference in a classroom, in the Putra Inno-Creative in Teaching and Learning 2018 (PiCTL). The report has won the Gold medal in the exhibition. In August 2018, the authors have shared their experience in running a MOOCs- based PBL module in yet another national competition - National e-Content Development Competition 2018 (eConDev) and has won the Gold medal from the competition.

Conclusion

Applying a multimodal strategy such as the PBL has a great potential in engaging learners with different learning styles. As the implementation of the strategy has shown improvements in terms of cognitive (grades) and practical skills (communication, collaboration) among engineering students, it provides a basis for greater discourse or even implementation in a different context. Educators may consider other assessment modes that takes into account the modalities of the VARK to provide opportunity for better engagement and knowledge attainment.



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ID NO. TU013	TOPIC: HUMANIZING STUDENTS FEEDBACK RESPONSE SYSTEM & CREATING IMPACT STUDENT SATISFACTION VIA ONLINE COLLABORATIVE PLATFORMS

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Abstract: Feedback is generally seen as an essential component in teaching and learning, which has strong influence on students' competences, understanding, motivation and confidence. The feedback that students receive from summative assessments tends to be grade-focused and pay little attention to the humanized learning experience. Effective feedback should be timely and personalized, so that students have meaningful experience that leads to better learning gains. In this paper, two online platforms (TEAMMATES and Google tools) were used to dynamically support assessment for learning by inviting students to collaboratively and actively engage in generation of informal formative feedbacks. TEAMMATE provides a powerful peer feedback and evaluations mechanism with a very high degree of flexibility. It delivers concrete evidence to document students' achievement and growth over time that enables students to obtain feedback on their work at an early stage in a timely manner. Such setting allows them to empathize their peers and respond to their peers' feedback in future group work. Google tools such as Google spreadsheet and Google slides on the other hand provide a synchronous collaborative communication platform where students can write and edit on the same document while instructors can also provide feedback and suggestions for improving the assessments in real time. The focuses of these informal formative assessments include conceptual understanding on intellectual, practical and social aspects where personalized feedback was provided throughout the assessments. Overall, students commented that the personalized early feedback responses provided via the online collaborative platforms encouraged engagement, motivation and achievement on their learning objectives.

Key words: *Early feedback response, collaborative platform, humanizing technologies*

Content

Feedback is an essential element of instruction that can occur laterally and hierarchically, from student to student, instructor to student and student to instructor. According to Garrison & Arbaugh (2007), teaching presence, social presence and cognitive presence in a community of inquiry is affected and shaped by feedback. In addition, it will affect students' competences, understanding, motivation and confidence. Meaningful feedback should be timely, personalized, allows students to monitor and ensure that they are on the right path towards their goals. At the same time it also helps instructors to assess

effectiveness of their teaching and improve the process. Nevertheless, feedback is often grade-focused and mechanized, which can de-humanize and compromise the learning experience. Hence in this study, two online platforms (TEAMMATES and Google tools) were utilized to create feedback messages dynamically through collaborative practices, with the objective to provide timely and personalized feedback through online collaborative platforms in supporting of student achievement of learning objectives.

TEAMMATES and Google tools are free and flexible online systems that could facilitate peer feedback and assessment among students. TEAMMATES delivers frequent peer or instructor assessments that provides consistent feedback to the students and permits instructor to monitor closely how various teams and individual students are doing in the class. It encourages multiple formative feedback activities during group project or assignment where the students can receive early feedback on whether their performance requires improvement. Later on, another session could be used to help the team keep on track. Such setting prioritizes presence of both instructor and student through sharing a human response wherever and whenever possible, which also allows students to empathize their peers and respond to their peers' feedback in future group work. Alternatively, Google tools enables instructor to gather student images, avatars and background information that can assist the instructor to know the student as a person and visualize the student as individuals when feedback is written. Humanized feedback messages can be created using text, image, audio and video through Google spreadsheet and Google slides, that provide a synchronous collaborative communication platform where students can write and edit on the same document while instructors can also provide feedback and suggestions for improving the assessments in real time. Most importantly, feedback content can be structured through focus, comparison, function, clarity, tone and specificity in both TEAMMATES and Google tools in order to make connections between instructor and students, so the students will know the instructor is there for them.

According to Tomlinson & Moon (2013), effective feedback includes attributes such as building trust, clear communication, user-friendliness, specific, focused, timely and actionable. While mechanization and computer control in learning environments are increasingly designed in feedback system, both TEAMMATES and Google tools support human to human interactions in these digital spaces. The focuses of these informal formative assessments include conceptual understanding on intellectual, practical and social aspects where personalized feedback was provided throughout the assessments. Humanizing the content of feedback will lead to enhanced learning in the students where students will accept descriptive rather than evaluative feedback and apply feedback to improve their learning. It will address cognitive and motivational factors that can transform a dull and boring subject into lively and engaging topic. Overall, students commented that the personalized early feedback responses provided via the online collaborative platforms encouraged engagement, motivation and achievement on their learning objectives.

Acknowledgement

The authors would like to express their sincere gratitude to Taylor's University for the support and opportunity.

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ID NO. TU014
**TOPIC: “Shifting, Framing & Humanizing” Learning
Approach for Hubungan Etnik Participatory Online Course**

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Highlights: Please provide a 250 - 300 word summary of the project.

Hubungan Etnik module at Taylor's University has been shifted and framed to create transformational learning aligned to Gen-Z learners as well as the 4th Learning Revolution, using a gamified, Participatory Online Course (POC). This new methodology of learning was able to create significant impact on the learning of students, leading to a noteworthy increase in the quality of student work produces, as well as improved grades. This new methodology was a one-click learning platform for student-instructor engagement. It allowed students to be immersed in the learning activity by producing a simulated learning environment that mirrors what they encounter in real life. Students would then find their answer or create content with minimal supervision from the lecturer. Moreover, the application of technology together with specific learning process enhanced student critical thinking skills to solve problem as they are involved and participated in problem-solving questions. Online learning has been humanized through this POC where students more likely to be motivated, be satisfied with their learning and succeed in achieving the course objectives. There are three approaches of how this POC humanized learning namely the presence of instructor online and offline, Empathetic interactive instructor and building awareness in their online learning. Ultimately, humanized learning increases the relevance of content to learners and improves one's motivation to log-in week-after-week. As a result, the students began to submit higher quality work, whether in learning activities and in their submitted portfolios. In addition, the final results also recorded improvements where the number of students scoring A grade increased while the percentage of failures decreased. Through the design and implementation of Hubungan Etnik POC, it was able to improve student's performance, engagement and results, certainly no easy feat when the majority of the module was delivered online.

Key words: *online, humanizing, participatory*

Introduction

Taylor's University has been offering the course Hubungan Etnik as credit transfer MOOC since March 2016 where by 100% of its content is online as Participatory Online Course (POC) format via the OpenLearning portal. Hubungan Etnik POC become one of the initial project of Taylor's University to revolutionize learning to aligned with the 4th Learning Revolution. The total no of students who have enrolled into Ethnic Relations POC from 2016 to 2018 to be 3937 students. The traditional classroom learning has been completely Reimagine and Redesign to create transformational learning that aligned with Generation-Z (Gen-Z) learners. This POC become one-click learning platform for student-instructors engagement and focus on concise, interactive video content for students to wade through at their own pace as well as the opportunity to explore other forms of learning resources in effective and interactive manner. Videos used as a means to deliver effective learning with self-paced segments that help learners manage essential cognitive processing, as well as adding gamification elements to create challenge and enjoyment of assignments, which consequently enhances motivation, engagement, and maintain longer attention span which leads to high-quality work.

Content

Innovation, Module Development, Design & Process

From face to face lecture to 100% online and the learning activities have been transformed. Weekly learning activities have been shifted and framed into online learning activities. The learning activities designed in a various ways to meet the need of students and to make sure learning outcomes will be achieved at the end of the semester. Weekly activities like forum, fill in the blank, sharing picture and self-reflection, news analysis and picture analysis are designed to achieve learning outcomes. On top of having weekly activities, students also need to do group assignment and mid-term and final examination.

POC allows students to be completely immersed in the learning activity. It produced a simulated learning environment that provides students with experiences that close to what they encounter in real life. Students find the answer/create content with minimal supervision from lecturer. Not just learn the available content, but they go into deep learning when applied critical learning skills to get the answer for the given task. Task will increase their engagement and motivation level when they truly involve and give freedom in their learning.

POC also creates an enjoyable learning experience as the learner is completely involved into learning resulting in increased knowledge retention. Blending immersive learning techniques with POC brings in maximum impact using various characters in the course, case studies, assignments and form that enable effective knowledge transfer.

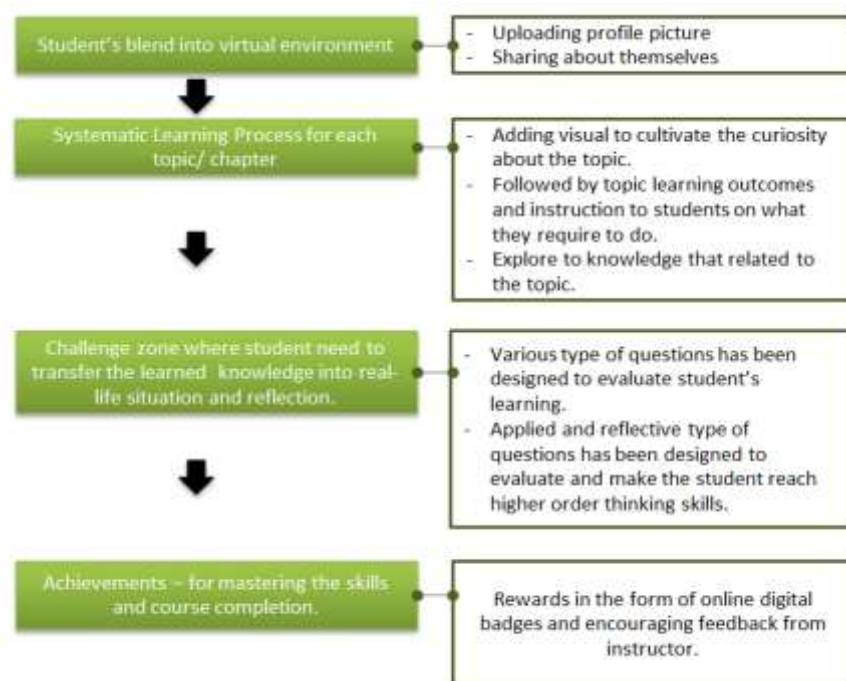


Figure 1: Systematic learning process of HE POC

LEARNING FRAMEWORK FOR ETHNIC RELATIONS POC AT TAYLOY'S UNIVERSITY		
Beginning of the semester (Week 1)	During the semester (Week 2 – 13)	At the end of the semester (Week 14)
1. Weekly social learning activity through openlearning portal (Week 2 – 13) 2. Synchronous classroom via YouTube live 1 st session (Week 5) 3. Reflective learning 1 (Week 5)	8.	1. Synchronous Classroom via YouTube 3 rd session 2. Reflective learning 3 3. Feedbacks from lecturer 4. Final Examination

4. Synchronous classroom via YouTube 2 nd session (Week 9)		
5. Reflective learning 2 (Week 9)		
6. Submission of assignment (Week 9)		
7. Mid-term examination		

Figure 2: Learning Activity for Ethnic Relations POC at Taylor's University

Humanizing Learning Through POC

Important of POC to Education

The methodology is important to our education system as its proven improved students' performance and at the same time prepare students to go to the market place and face the real world. Whereas for knowledge, this approach helped the students to improve their grades and increased student's engagement in learning activity. Ultimately, it also added values and enhanced student's attitude and skills which indirectly improved student's employability. Factors of improvement mentioned in the above shall be detailed in topics below. Through POC, we provide our students with 21st century skills where students are equipped with leadership skills, conceptual skills and interpersonal skills.

Examination Results (percentage of students attaining the grades below)											
Semester	A	A-	B+	B	B-	C+	C	D+	D	D-	F
2017	16.29	25.82	17.15	14.78	15.32	5.48	1.5	1.49	0.62	0.49	1.1
2016	17.40	23.70	10.93	11.93	9.88	11.50	7.50	2.33	2.08	1.50	1.25
2015 (Before POC)	11.58	11.39	14.68	11.34	17.98	14.83	8.09	1.41	3.60	2.70	2.4

Table 1: Comparing results before and after POC implementation

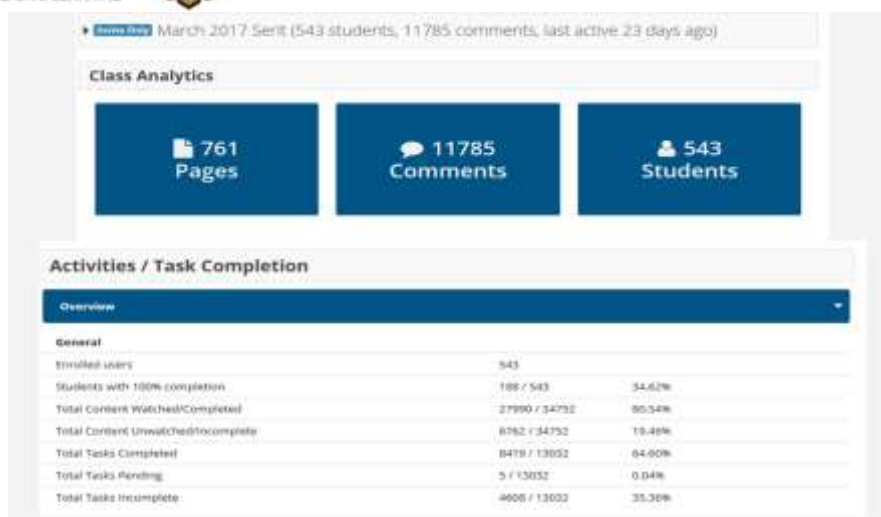


Figure 2: Summary of task completion by Hubungan Etnik students

Daily Active Students

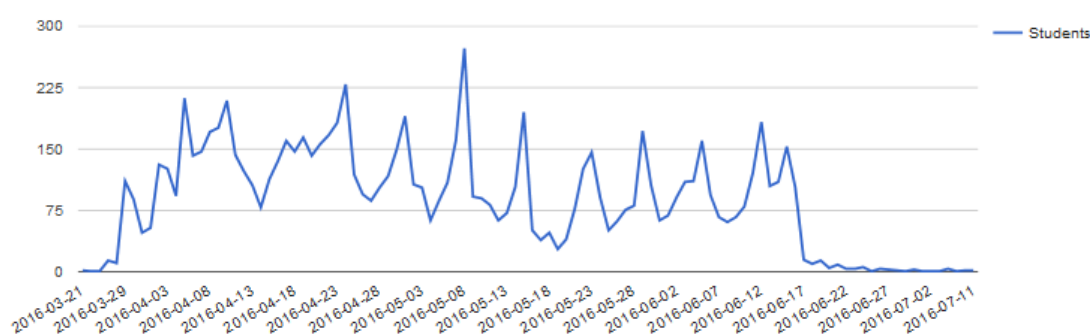


Figure 3: Daily active students for Taylor's University Ethnic Relation POC

Table 2 shows improvement in grades comparing before the implementation of POC and after the implementation of POC in Year 2016 onwards. The final results also improved as the percentage of students scored A grade increased where the percentage of failure is decreased. According to Figure 2 & 3, the engagements made by students and instructors in this POC are also very consistent with great outputs and high in efficiency. Students and instructors continuously communicating and discussing with each other inside this POC every day, since the POC is made available. Overall, student performances, student engagements, student results are improved after we introduced Ethnic Relations POC in our institution. This obviously shown that Ethnic Relations POC reinforced the quality of teaching and learning in Taylor's University.

Advantages of POC

At Taylor's University, the objective is always to improve teaching and learning pedagogy, besides to inspire, educate, explore, engage, as well as to work on offering an international standard education. POOC deliver a personalized learning experience tailored to students' learning abilities, needs and

understanding. By incorporating 'e-elements' in the curriculum, students get to be more active in learning at their own pace, while changing the routine from "teacher-centered" to "student-centered" learning.

POOC also designed as a one-click center for students to get all learning materials easily online, complete all related activities, engage with peers and also submit their assignments all in one place. The features provided in POOC also help the instructors to access students' learning and performance online in a more engaging way.

Students also will learn in a collaborative, self-directed and personalized manner anytime and anywhere. As today's students are considered "digital natives", this POOC have been made available in both on desktops and mobile devices, making it more accessible and inclusive. This POOC also using a method of gamification through badge offerings which motivate students, gain their interest and create a sense of competition while learning the underrated Hubungan Etnik subject.

Based on student reflections, it is indicated that Hubungan Etnik module provides the opportunity for them to learn more about Malaysian cultures and politics with their own ways. Students said that this module created awareness and encouraged them to learn more on different cultures in Malaysia. As some of them came from international school, they did not learnt Malaysian cultures during high school and this is the first time they learnt about Malaysian cultures. This will give them the sense of feeling to be a Malaysia.

Focus group discussion has been conducted to get the feedbacks from students and some of the students feedbacks as per below:

*"I personally think the Hubungan Etnik POOC provided the opportunity for me to **think deeply** and be more **aware** about the culture and politics happening in the country"*

*"I think it is **eye-opening** because I get to know more about different cultures"*

*"I am **curious** to acknowledge, learn and honour my identity as an educated Malaysian and a patriotic ethnic Chinese in Malaysia"*

*"It was a great module for students to explore more on relation between ethnics that we might not notice. This module gives opportunities for students **to widen their knowledge** on ethnics relation and knowing the importance of it to maintain a peaceful country"*

*"In my opinion, Hubungan Etnik plays an **important role** to guide us to learn more on it"*

A variety of videos and information is provided to help us learn , along with activities and work to make sure we really understands.

He gave clear instructions every week in regards to what and how we need to do our weekly assignments. overall, he is quite good.

This subject may be a little confusing and boring, but with the help of online learning throughout the subject, it makes the subject to be fun to learn. moreover, ive learnt a lot about the syllabus.

Mr. serit is a cheery person, love that. his homeworks improves my essay skills besides than getting to know more about cultures.would like to attend his class his own teaching one fine day. if, and only if his class is available or exists

I like how its online learning and still we get to do a port folio which makes it not so dull. me serit is really nice and they even have an online live session which i think is effective.

Excellent

He gave clear instructions every week in regards to what and how we need to do our weekly assignments. overall, he is quite good.

Good

Great lecturer. help student to be creative and be more critical.

Figure 7: Students' feedback through Teaching Engagement Scale (TES)

Students actively involved in learning activities and at the same time Ethnic Relations POOC brought students into another level of learning process. Results of a post module evaluation report (No of students = 1675):

1. 84.46% students agreed that the materials provided expanded their understanding on the content to a new level or deeper degree.
2. 89.10% students agreed that the technology used in the course supported that goals of the course.
3. 86.56% students agreed that their level of motivation increased upon knowing they will receive a badge upon completion of an activity.
4. 91.84% students satisfied with the quality of multimedia (audio, video and animation) used in the course.
5. 89.03% students agreed that the technology part of the course was well organized, easy to navigate and logical.

Commercial Value of POC

Rewards and Recognitions

This module has received awards and recognition at institution, national and international level. By the year of 2016 just after this project launched, it was short listed Top 5 for Wharton-QS Reimagine Education Awards. A year after that, this module won 3rd place at Malaysia 2017 Higher Education Thinking and Redesign Award as the results of it success empowering student experiences in the education space that helps them improve their learning capabilities, and revolutionizes online learning and making meaningful learning.

At the institutional level, the instructor for this module won Exemplary Meritorious Academic Staff (EMAS) Award Cycle 3/2017. EMAS provides recognition for academic staff who introduce innovative techniques, pedagogies, methods of delivery, ways of thinking about the course and/or technologies in their teaching and learning or assessment approaches, and which result in significant improvements in learning outcomes. As the results, this module was featured in a publication and have their profile published internally or externally. The instructor for this module also invited to conduct the workshop for his fellow academics on his innovation.

Table 2: National Awards and Recognition Received by the Ethic Relations POC

No	Achievement	Award/Recognition	Provider	Title	Year
1	Shortlisted	Digital Content Award	Wharton-QS Stars Reimagine Education Awards	MNS MOOCs – Promoting Practical and Flexible in Mobility digital content for Malaysian National Subjects.	2016
2	Winner	Exemplary Meritorious Academic Staff Award	Taylor's University	The Transformation of Ethnic Relations Module: From Face to Face to Participatory Online Course (POC)	2017
3	Silver medal	Redesigning Assessment for Holistic Learning (RAHoLE 2017)	University of Malaya	Implementation of Group Based Assessment in Project Based Learning for Ethnic Relations Module at Taylor's University	2017
4	Silver medal	International University Carnival on E-Learning	Ministry of Higher Education, Malaysia	The Development of Ethnic Relations as Credit Transfer MOOC	2017
5	3 rd Place	Malaysia 2017 Higher Education Thinking and Redesign Award	Ministry of Higher Education, Malaysia	One-Click to Participatory Online Course (POC) on Ethnic Relations	2017

Our main focus is to make this module become Credit Transfer MOOC in future where students from outside TU can easily register as a learner in this course. At the moment, our project is ready to be offered to other student from other higher learning institution but the student will need to register and their application is reviewed and accepted on case by case basis. Outside students can register into our POC by submitting a simple questionnaire before they are enrolled submitting info on their learning institution, reason to take the POC as well as other personal info. In future we also want to open our module to students from all over the world as credit transfer module.

1. Offer this module to other students from all over the world as credit transfer MOOC - By 2020, we are targeting to offer this module to students from all over Malaysia as a credit transfer MOOC with affordable fees. This will give chance for students from another institutions to experience doing 100% online module. By offering this course as credit transfer MOOC,

- students can also plan ahead in preparing for their universities years by taking this module earlier after they finished high school before they are enrolled in any university
2. Offer this module to students from all over the world - This module informs the learners on the history of Malaysia, the basic concept and theory of ethnic relations, economic, politics, education system and daily life of Malaysian society. These topics will be fascinating to those who want to learn about Malaysian society. Therefore, this module can be offered as credit transfer mooc to students from all over the world who want to learn about Malaysia. Students from the other countries will not have problems to understand this module as this course is taught using bilingual language, both in English and Malay language.
 3. Offer to foreigners and foreign worker - This module is also suitable to be offered to foreigners and foreign workers who want to make Malaysia as their second home. This course will help them in appreciating the culture and history of Malaysia.

Acknowledgement

We are grateful for the eLearning Academy, Vice-Chancellor Office, School of Liberal Arts and Sciences, Centre for Languages and Cultural Studies of Taylor's University for their support in this project. Not forgotten, thank you to all students who are taking this this module since March 2016.

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ID NO. TU015	TOPIC: Humanizing the Online Learning Experience with H5P: A New World of Learning Interactive

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Highlights: There has been a growing interest in innovative teaching approach to match the learning style of 21st century learners. These learners are technologically savvy and more interest in digitally-rich online learning environment than static textbook or traditional talk and chalk teaching method. Interactivity is one of the reasons they spend more and more time browsing through the multimedia content on the Internet. Over the past few years, there is an increasing emphasis on blended learning at Taylor's University. Through the implementation of TiMeS (Taylor's Integrated Moodle e-Learning System), Taylor's students are given opportunity to experience a variety of virtual learning and collaborative tools beyond the classroom. With the university's focus towards the blended learning approach, new learning objects are to be developed and existing digital learning objects need to be enhanced, so that students are able to actively engage with the content and reflect on their learning. The introduction of H5P is increasingly gaining popularity as a tool to spice up the online contents. H5P (HTML5 package) is an open source online authoring tool to create rich interactive e-learning content such as interactive videos, presentations, games and quizzes. H5P offers a new world of learning experiences to learners as this study will showcase the use of H5P to create various interactive learning objects. By using survey questionnaire, this study intends to investigate the effects of these H5P learning objects on student feedback, learning and engagement.

Key words: *H5P, interactive learning, online learning, humanizing technology.*

Introduction

Numerous findings have shown that student' learning outcomes were improved with the implementation of blended learning, a combination of online learning or technology enhanced tools and traditional face to face classroom instruction (Means et al., 2009). The purpose of introducing blended learning was to improve student success and engagement and enable students to learn at anywhere and at any time. Over the past few years, there is an increasing emphasis on blended learning at Taylor's University. Through the implementation of blended learning approach, Taylor's students are able to utilize virtual learning material and collaborative learning tools, allowing them the opportunity to expand their learning experience beyond the classroom.

Taylor's Integrated Moodle e-Learning System (TiMeS) was created to complement or enhance the classroom face to face learning. TiMeS is a Moodle-based learning management system where lecturers design and deliver online learning experiences to students. Previous finding has shown that interactivity is important in learning (Moore1989). Moreover, numerous studies have shown that interactive multimedia tools can lead to enhanced student engagement (Esquela-Kerscher et al., 2016; Lustria, 2007). Interactive content has the potential to provide students with new ways of interacting with various representations of information and allows them to explore ideas in innovative ways. Unlike traditional printed textbooks, interactive content can transform learning into an active process where students can visualize relationships, interact with dynamic content, and test their knowledge.

Many findings have shown that many online courses tend to focus simply uploading content online but offering little or no opportunity to interact or engage with the content, thus encouraging passive learning (Hashim, 1999; Salter et al, 2004). For example, many online courses merely reproduce the

textbook content on the web, simply upload the lectures' PowerPoint presentations on the internet, or upload YouTube video. Therefore, new innovation or educational technology need to be explored to enhance learning, engage students and motivate them to learn in an authentic and meaningful way. This study showcases the use of H5P in creating rich and interactive online learning content.

H5P: A New World of Learning Interactive

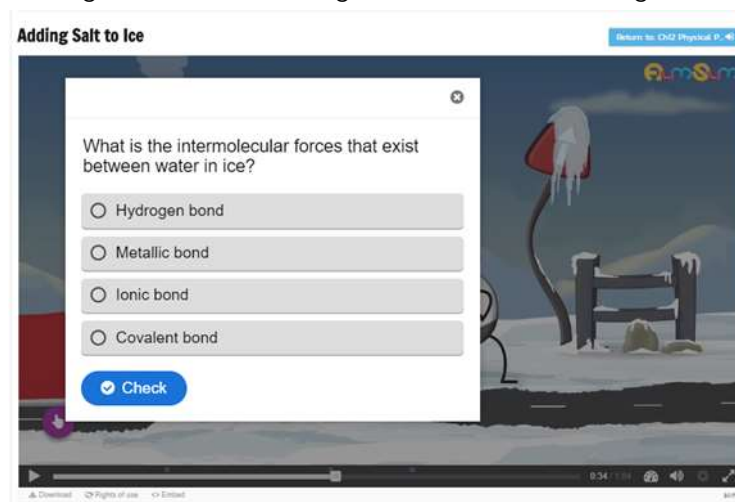
H5P (HTML5 package) is a completely free and open-source technology. H5P is rapidly becoming the best platform for creating interactive HTML5 content right from your browser without the need of design or software experience. H5P is one of the winners of the 2018 Open Education Awards for Excellence in the "open resources, tools and practices" categories (H5P, 2017). It is simple and easy to use with no plugins and no large SCORM packages. H5P is also mobile friendly. Students can experience the same rich, interactive content on computers, smartphones and tablets. H5P is supported by learning management systems (LMS) like Canvas, Blackboard, Moodle. Therefore, this powerful authoring tool can be integrated into TiMeS to create a new level of online learning experience. Moreover, the contents can be share, reused and modify in any browser at any time.

H5P offers numerous advantages. It can be used to create a rich, creative, interactive and more effective web experiences than other software such as PowerPoint or PDF. A large variety of content types can be created for various needs. As on date there are 33 different content types available in the H5P library, such as Interactive videos, drag and drop, course presentations, quizzes, dialog cards, games, interactive timelines etc. All these contents can be used as a tool for self-directed learning. For example, course presentation with interactive questions reinforces the learning as the student progresses through the presentation. By using the multiple choice content type you can create challenges where the students identify one or more correct choices. Drag and drop question enables the students to associate two or more elements and to make logical connections in a visual way. Study showed that students were more engaged with interactive contents such as interactive videos (Brame 2016). The interactive videos content type in H5P allows lecturer to add multiple choice, fill in the blank, pop-up text and other types of interactions to your videos. In a flipped classroom, students are exposed to H5P contents and they are required to complete them prior to attending face to face classroom, where they have opportunity to review the content in an active learning mode.

One of the usefulness of H5P is it promotes global collaboration. This is because the main goal of this open source technology is to empower everyone to create, share and reuse interactive HTML5 content. This technology can also be used as a formative assessment tool. Creation of interactive activity such as quiz provides students with immediate feedback on their performance. This is a great way of encouraging and motivating students to perform a task and reinforce their learning. Compared to conventional online quiz, the H5P tools extend the capabilities of the quizzes in a more playful and interactive way. Furthermore, H5P promotes self-directed learning as learners can do activities at their own pace and in their own time. When students complete an activity, their performance is recorded in the Moodle gradebook. This learning analytics helps lecturer to monitor student's performance and identify weak students in classroom.

A traditional classroom can be a place where little or no interaction ever happen. In contrast, a well-designed blended learning classroom (face to face and online technology) amplify the learning experiences, allowing students to interact not only with the contents but also with their peers. This can be achieved with the implementation of H5P technology in the classroom because it not just digitizes the curriculum but it also humanizes learning.

Figure 1: Online Learning Interactive created using H5P



Acknowledgement

I am grateful for the e-learning academy in Taylor's University for their support and technical assistance in implementation of the H5P and TIMeS.

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ID NO. TU016	TOPIC: Humanising e-Learning Activities within the ReDAS Model to Promote Self-Directed Learning in a Digital Classroom

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Abstract: Given the continuous advancements in science and technology, we need to prepare our students to engage in lifelong learning. The ReDAS model is introduced to promote self-directed learning among students for science modules. ReDAS is a model within the Moodle learning management system that consists of four components; Re: Revision, D: Concept Development, A: Assessment and S: Self-Reflection. The "Revision" component consists of lecture notes, lecture recordings and suggested self-learning resources such as video or journals. "Concept development" component consists of exploratory learning activities, "Assessment" component focuses on online quizzes and "Self-reflection" component requires the students to self-reflect on their learning. Such comprehensive model allows students to learn independently at their own paces and explore knowledge at a greater depth. Importantly, the e-learning activities within ReDAS model are planned starting with the students in mind and working backwards to the technology. The activities are designed to ensure that students can feel the presence of their lecturers and feel connected at all times even within the digital classroom. The real-life recordings and real time feedback given to the students provide them with a sense of security that their lecturers are virtually present and able to provide assistance whenever needed. The online recorded lectures can also be converted into podcasts, where anyone who is interested in the particular content can download them for a small fee or follow the podcasts through RSS subscription. In addition, the activities also encourage students to stay connected with each other within the online environment, so that they can have a sense of belonging and place in the virtual classroom (within digital learning management system). Ninety percent of our students revealed that they understood how these technology are related to their learning objectives and assessments through this approach.

Key words: *E-Learning, Self-Directed, Humanizing Technology, Lifelong Learning, Flexibility.*

Content

Self-directed learning is described as an inborn potential utilized by human beings at various time in their life while encountering new and challenging situations (Knowles, 1975). Merriam and Caffarella (1991) defined self-directed learning as a form of study in which learners have the primary responsibility for planning, carrying out and evaluating their own learning experiences. This skill is critical to allow learners to adapt to the fast changing environment and subsequently enhance their creativity. The development of SDL may help learners to adapt to changing environments and enhance their creativity.

This innovation describe the use of ReDAS model within Moodle learning management system. This model consist of four components which includes Re: Revision, D: Concept Development, A: Assessment and S: Self-Reflection. The "Revision" component consists of lecture notes, lecture recordings and suggested self-learning resources such as video or journals. In a conventional lecture, the attention of most students starts to decrease after fifteen minutes (Goss Lucas & Bernstein, 2003), so this approach can help to keep students focused and learn on their own pace. Considering the attention span of students, the lecture were recorded in byte size which lasted for about 5-10 minutes. Therefore, lecturers

have to ensure that only important information is recorded in the video. This is to ensure that the students are flexible to learn within their attention span. This would mean that students have more time to process and reflect on concepts and increase their prior knowledge before coming to class to apply their learning.

"Concept development" component consists of exploratory learning activities. This concept development activities focus on development of critical thinking and problem solving skills which allows them to integrate the knowledge across different unit and perhaps different course. Therefore, the activities proposed must be related to real life and technical problems that required them to troubleshoot. This proposed activity prompt the students to think of solution for troubleshooting which will encourage systematic activation of prior knowledge and effective articulation of new learning objectives. Troubleshooting on an unexpected basis, and freedom to propose their experimental design allows students to take charge of their own learning and become actively engage. This will foster the reinforcement of the key learning (critical thinking). In fact, this skill is also needed to promote learning across course boundaries. In addition, this organization of learning experiences that they can apply in several subjects and areas of the student's life would help them to construct new knowledge and improve knowledge retention.

"Assessment" component focuses on online quizzes. A pre-test in the form of short online quizzes is being set to diagnose student performance. Feedback and results reports can be generated almost immediately once the quizzes has been completed. This timely feedback allows students to be informed on their weak area and subsequently improve their understanding of content related to the particular topic. This will prompt the students to self-reflect and do self-directed learning through repeat learning from the lecture recording or searching for information from other online materials. Post-test (multiple choices or short answer questions) was then created online to provide a second opportunity to test their level of understanding. These quizzes were created specifically for each designated topic as a non-graded formative assessment. This type of assessment allows students to evaluate their learning and provide an evidence for the lecturers to determine where the learners are in their learning. Answers to the question will be provided to them automatically upon submission of the assessment/ online quizzes. These type of assessments will later help them to improve for the summative assessment such as Mid-semester examination and Final examination. Lecturers will be available through the online platform to provide feedback whenever required.

"Self-reflection" component is the part where students self-reflect on their learning. The self-reflection components require students to assess on items that they do not know before the lesson and knowledge that they have gained after the lesson. The students also need to reflect on how the lesson have change their perspective and how the lesson can be used in their daily life or future career. This non-grading system allows the students to participate without the stress factor and get to know themselves better. Numerous evidences has suggested that stressful experiences may affect learning and memory processes (Schwabe et al., 2012). Therefore, it is important to provide an environment that motivate students to learn rather than stress.

In this learning climate, the students create knowledge instead of consuming information (Gagnon & Collay, 2001). Learner must always involve in reconstructing the meaning of the knowledge personally by which learners can be motivated and actively engaged in the process of skill development. Learning through this type of active participation is more likely to facilitate critical thinking and problem solving skills as students work collaboratively to construct their own new knowledge based on different past experiences (Azizinezhad & Hashemi, 2011). This technology also promotes democratic processes and includes a safe as well as less competitive place to learn. This less competitive environment will further promote collaborative learning and team spirit. The students can also reflect and construct knowledge with the help of their teacher and peers through class and online discussion (Bennett et al., 2013).

In addition, this teaching approach can also be applied to classes with large number of students. Each students can learn on their own pace without affecting others through the online lectures. The activities can be done based on small groupings (in physical and virtual classroom) which ensure sufficient attention given to each and every students. Ultimately, this type of virtual and independent study can

help students in acquisition of critical time management and self-organization skills, enabling them not only succeed in their current classes, but in college and beyond (Helyer, 2015).

Such approach can also efficiently cater for heterogenous group of learners (learners with diverse multiple intelligence). Often, the conventional face-to-face delivery method focuses only on the verbal/ linguistic which may not cater for all learners. On the other hand, this teaching approach is design to address the need of students with various types of multiple intelligences. Therefore, clear benefits of this approach is that learners can control their learning pace and learn according to their preferred style. The ability to rewind and listen to a presentation or explanation repeatedly can also help some students to make more meaningful notes or overcome language fluency issues. Many students find it useful to repeat segments of an online presentation when they are facing difficulty with a particular concept or when they are studying for the final exam. In addition, this model also allow students to communicate more with the lecturer and their peers.

This model also display some commercialization potentials. The online recorded lectures can be converted into podcasts, where anyone who is interested in the particular content can download them for a small fee or follow the podcasts through RSS subscription. Audiences are not limited to university students, as the content can be made available to anyone across the globe. In addition, the interactive online activities can be converted into paid educational apps that promote an active, engaged and meaningful learning.

Acknowledgement (if any)

We are grateful for the e-Learning Academy in Taylor's University, Malaysia for their support and technical assistance.

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ID NO. TU017	TOPIC: Closing the Humanization Gap: The Interplay of Artificial Intelligence, Augmented Reality and Neuro-Linguistic Programming in studying Legal Skills and Methods module

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Highlights:

In an era where lawyers nowadays are being challenged by the works of artificial intelligence (AI), it is pertinent for law students to be equipped with the latest use of technologies. Law students are taught on how to study law, perform legal research and legal writing by utilizing the online legal research platform such as Lexis Nexis and Westlaw. Whilst the incorporation of artificial intelligence into these online legal research platforms makes it simpler for the students to find the relevant cases, it does not bring a deep personal learning experience to the students. Hence, in March 2018 semester, the teaching pedagogies for Legal Skills and Methods module have been enhanced to incorporate the use of Augmented Reality ('AR') and Neuro-Linguistic Programming ('NLP'). The use of AR encourages the students to utilize the latest technologies to study law independently outside the classroom and to think creatively in finding solution to the issues presented. In addition to that, students are also taught to utilize NLP techniques in order to deliver a human element to digital learning. The interplay of AI, AR and NLP can flip the classroom into student-centred environment. Law students will be able to embrace the existence of AI and also develop NLP skills set which is not provided by any AI platform. The overhaul teaching techniques for Legal Skills and Methods will effectively humanize and equip the law students to face the 4th Industrial Revolution.

Key words: Law, Legal Skills, Augmented Reality, Neuro-Linguistic Programming, Artificial Intelligence, Fourth Industrial Revolution, Humanizing Technologies

Introduction

Content

Legal Skills and Methods module is an essential module for all Year 1 law students to study in order to fulfil the Programme Learning Outcomes upon the completion of their studies. The module utilizes online legal research platforms such as Lexis Nexis and Westlaw in order to ensure that the students are able to perform legal research and legal writing effectively. Nevertheless, since the use of Lexis Nexis and Westlaw incorporate artificial intelligence (AI) in their platforms, the critical thinking process is lacking for the students as most of the research are done by the artificial intelligence within Lexis Nexis and Westlaw platforms.

Realizing the need to enhance the delivery of Legal Skills and Methods module, the students are exposed to augmented reality (AR) learning and neuro-linguistic programming (NLP). The adoption of AR learning is able to bring down geographical, finance and time barrier for lecturers to provide students access to enriching materials that can only be found outside classroom (Dunwil, 2016).



Figure 1: Left - The poster on Legal Skills and Methods class activity available around campus. Right - An example of two-dimensional images that appeared on students' mobile phone after scanning the poster found around the campus.

The adoption of AR in studying law serves as a response to Klaus Schwab's view on the Fourth Industrial Revolution. He perceived that the wave of automation and technological innovation will 'robotize' humanity and will 'disrupt' the education industry (Klaus Schwab, 2016). Nevertheless, the application of AR in studying law works in a way that is unimaginable. The law students are able to think beyond what is expected of them, incorporating technologies and NLP skills in their learning and are able to demonstrate what they have learned to the public in a very humanely manner. This is despite the fact that they are Year 1 semester 1 students.

The exercise of NLP involves the study of human excellence, demonstrating how to communicate using body language, emotions, attitude and words in order to build rapport (Savitri Dias, 2016). The teaching of NLP encourages the students to understand how the brain works and how to influence thinking patterns. With the knowledge of NLP, the students will be aware on how unconscious mind works and to use various techniques to build rapport amongst their classmates as well as with the public at large. This is evident as the law students have successfully advocated the public on the newly legislated Act, 'Anti-Fake News Act 2018' using the NLP techniques and the relevant information acquired online.

The context or background of the innovation / product development / design / process

In Nov 2017 last year, CanLaw Asia organized a Lex Tech Conference raising awareness on legal technology. During the conference, many practicing lawyers raised concerns about the effect of artificial intelligence in the future the legal employment. During the conference there are some lawyers who are resisting the use of technology in the legal industry and there are some lawyers who are exploring how technology can be beneficial for their law firms. From this conference, it is apparent that legal technology is rapidly developing globally and the use of artificial intelligence in law firms is slowly gaining its recognition.

The concerns raised by the lawyers were the drive in the changes of the teaching pedagogies for Legal Skills and Methods module. In addition to incorporating technologies in learning the law, the students are taught to complement the learning via AR and AI with NLP skills. This places a human touch on the use of such technology. In addition to that, the interplay between AI, AR and NLP has the ability to develop students' digital literacy, intrapersonal skills, thinking and learning skills, cognitive capabilities and discipline specific knowledge. These skills correspond with the students' learning needs (Cambridge Professional Development, 2017) and reflect Taylor's Graduate Capabilities (Taylor's University, 2017).

The importance to education

There is no one size that fits all students' learning styles particularly when there are many types of students in a classroom (Sarah Kass, 2011). However, the incorporation of AI, AR and NLP reduces the dehumanizing tensions experienced by the students and their learning experience can be more interactive and engaging. Students will be more aware of their eye contact, voice intonation, body language and enthusiasm level amongst others when advocating the law to the members of the public. Students will be able to assess their personal development as a law student in Year 1 as compared to the skills that they have attained during pre-university studies. The self-actualization

plays an important role in students' growth (Shiv Tripathi, 2012). The adoption of AI, AR and NLP allows the students to appreciate social closeness and feelings of empathy which technology cannot teach the students.

Advantages of your innovation / product development / design / process towards education and community.

The adoption of AI, AR and NLP provides a landscape for students to be continuously inspired in their learning. AI provides the avenue for the law students to be exposed to the current issues. It eases the research process and allows the students to explore the resources available online in order to resolve legal problems. The adoption of AR complements the use of AI as it prepares the students to face the various changes in the technology that may affect the legal industry. The experience in learning via AR provides a novelty in learning law where the students can bring some new element in advocating the latest law to the community. This in turn will benefit the community at large. Lastly, the introduction of NLP in Legal Skills and Methods module allows the students to be more conscious in building rapport with the members of the public so that their advocacy on newly legislated Act will more effective, meaningful and impactful to the society.

Any commercial value in terms of marketability or profitability of your innovation / product development / design / process.

The interplay between AI, AR and NLP is not a mere engagement tool or a gimmick to get the students interested in studying law but it encourages students to explore, experience and understanding things better than just conducting legal research online or viewing videos (Lawrie, 2017). The utilization of technologies in learning law and the practices of NLP techniques increase students' level of confidence to advocate the public on newly legislated law by organizing a forum, talks, Conferences for the community. Such activity can generate profit for the students when they are able to secure participants attendance via the selling of the event tickets. The students will develop entrepreneurship skills apart from learning the law.

Acknowledgement

I would like to express my sincere gratitude to the e-Learning Academy team, Taylor's Law School and Sufian Supahan (Taylor's University Information Services Unit) for their continuous support, assistance, trust and encouragement in allowing me to incorporate Neuro-Linguistic Programming and Augmented Reality-based pedagogies into Legal Skills and Methods modules.

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ID NO. TU018

TOPIC: HUMANISTIC CENTERED CURRICULUM FOR THE INDUSTRIAL REVOLUTION 4.0: HCC-IR 4.0

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Abstract: Education is driven by training students for employment, from tagging as earner from learner. With the Industrial Revolution 4.0 (IR 4.0) targeting to generate full rounded graduates, the current industry players and educational watchdog often raise concern on that, the students do not emerge with the skill set that are necessary in a contemporary workplace. The substantial investment of time, and often of money, does not equip them to be placed in a well-paced career ladder. Pedagogies often focus on summative assessment – a test of what is learned – align well with the current view of education. In the current system it is time for the educational bodies to relook in itselves much on the humanising factor including giving the ownership for the student to plan their studies on what they wanted to do that will align them towards achieving their dream. Recently at the Taylor's University School of Engineering the course curriculum is revamped with a layered and lateral perspective that could get opportunity to enhance their ability in their area of interests. Within the chosen major student design their own curriculum and modules with the help of a mentor. A four year tier model will have the student to choose a package of courses that makes him technically skewed with expertise or choose allied subjects that could support his/her entrepreneurial dream. A web based tool is developed to assist the process in their planning and adds for him as a guide throughout the study period making the learning immersive and humanistic knowledge building for the future which is presented in this award. With the Industrial Revolution 4.0 targeting to generate full rounded graduates, pedagogies often focus on summative assessment. Recently at the Taylor's University School of Engineering the course curriculum is revamped with a layered and lateral perspective that could get opportunity to enhance their ability in their area of interests. Within the chosen major student design their own curriculum and modules with the help of a mentor. A four year tier model will have the student to choose a package of courses that makes him technically skewed with expertise or choose allied subjects that could support his/her entrepreneurial dream. A macro enable tool is developed to assist the process in their planning and adds for him as a guide throughout the study period making the learning immersive and humanistic knowledge building for the future.

Key words: Immersive learning, humanistic, knowledge Building community, IR 4.0, lateral education.

Introduction

The advancements in robotics, virtual reality, cloud technology, big data, artificial intelligence, the internet of things and other technologies are the key drivers in the fourth industrial revolution (IR 4.0). In a futuristic perspectives this is characterized by merging of the technologies and drawing closer lines between the physical, digital and biological aspects for the betterment in life. But the real challenge in the IR 4.0 are not exactly the same as the skills required in the prior revolutionary breakthroughs. The transformation of the realistic IR based characteristics to the human centered characteristics including the critical thinking, people management, emotional and inquisitive intelligence, empathically judging, and resilience with cognitive flexibility, with life-long learning management. Technology innovations reduce the constraints of students in class room environment – instead they collaborate to discuss with peer fellows, be more self-directed and independent in their learning.

This imperative drives and require much more interdisciplinary teaching, research and innovation in universities making avenue for high mobility across different sectors possibly in different countries. Convergence of pedagogies across different domains reduce the subject distance between humanities and social science as well as science and technology.

With the Industrial Revolution 4.0 targeting to generate full rounded graduates, pedagogies often focus on summative assessment. Recently at the Taylor's University School of Engineering the course curriculum is revamped with a layered and lateral perspective that could get opportunity to enhance their ability in

their area of interests. Within the chosen major student design their own curriculum and modules with the help of a mentor. A four year tier model will have the student to choose a package of courses that makes him technically skewed with expertise or choose allied subjects that could support his/her entrepreneurial dream. A macro enabled tool is developed to assist the process in their planning and adds for him as a guide throughout the study period making the learning immersive and humanistic knowledge building for the future.

Content

Figure 1 shows the universal view of the humanistic centered macro-enabled model for the future educational scenario. At Taylor's school of engineering we are pioneering to integrate different analytics to the common framework that would involve the stakeholder (student) as the prime in the design of their own curriculum with the help of the mentor. A macro enabled tool aid in the preparation of the study plan where the student can decide the options without compromising the context of the course he is enrolled. This gives a flexible, broad based and personalized study plan which drives the major criteria.

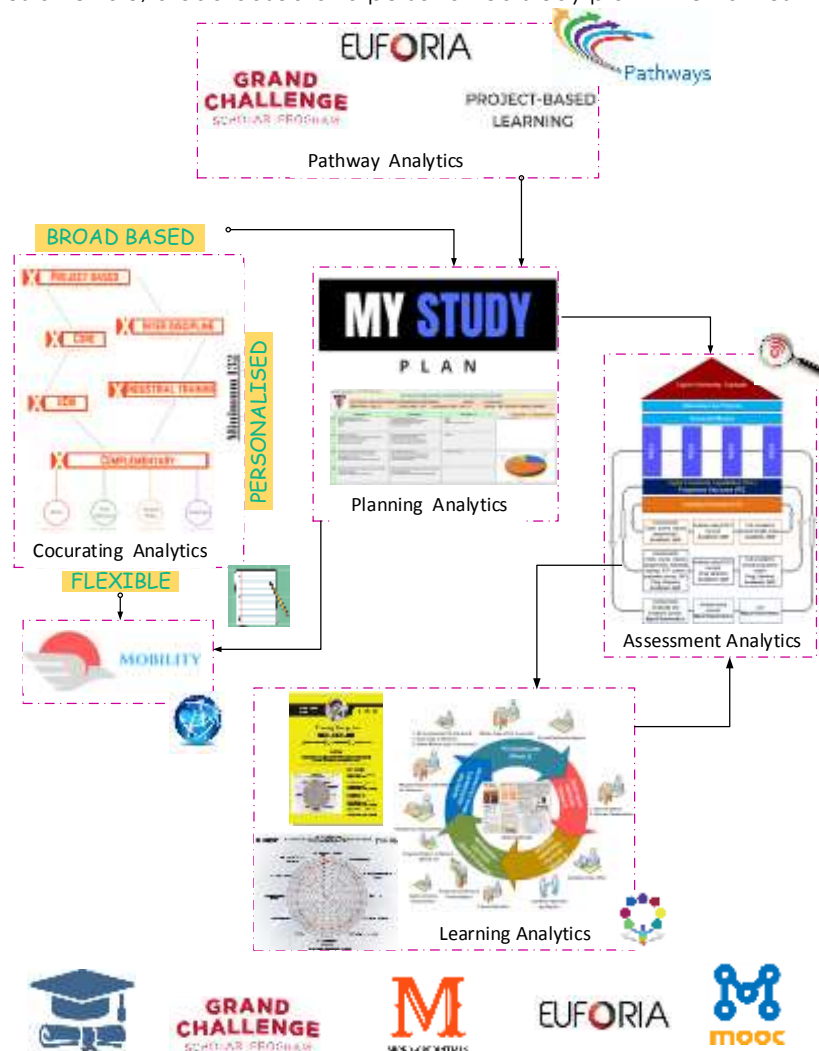
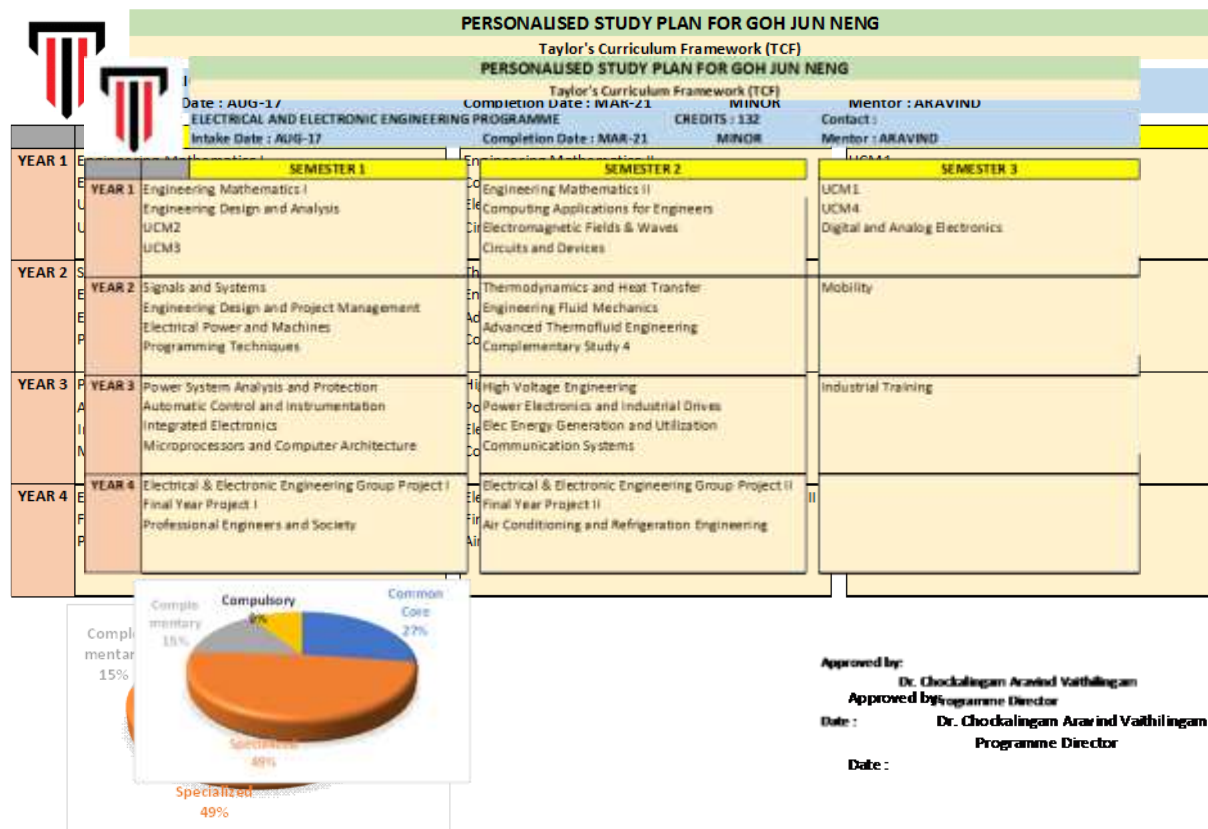


Figure 1 Humanistic Centric Curriculum Model for the IR 4.0

The macro enabled tool help an easy way to visualize the choice of the design process. It aims to also help to aid to inform the constraints during the design process. This gives ownership of the student to design the way what knowledge pyramid they want to acquire before graduation. The design tool has essentially five analytics including the choice of the pathway of study, co-curating the curriculum through the planning tool along with the students, an assessment analytics together with the learning analytics that make the check and balance of the outcomes, and also give options to resurface the study plan at any point of the four tier model. With the significance of the education today towards the broad based knowledge domain, with flexible acquiring of specialization and achieving personalized goals this is the

future of the education system. The tool as it is helps in a major way to balance the assessment learning through the PO score cards (from the learning analytics) design and modulation of the curriculum (from the planning analytics) the choice and design of streams (pathway and co-curating analytics) has a major potential in commercializing as individual analytic tool or as a combined tool. This can be tailor made as this macro-enabled tool is universal and any future analytics can be embedded within the given framework and hence it is a viable solution to the current generation of students and the future educational model. Figure 2 shows the MySP generated by the macro-enabled tool.



Acknowledgement

We are grateful for eLA Taylor's University for sponsoring to present the project at various events and also the school of engineering for their support to the project.

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ID NO. TU019

TOPIC: Re-Designing and Transforming Formal Learning Classrooms through Mobile X-Space

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Abstract: Learning spaces are now an essential aspect of the learning and teaching landscape. It is becoming more important now as universities are pressured to provide learning environments that is able to support students' multiple different needs. To address this need, Taylor's University has taken a bold decision to convert its tutorial classrooms into collaborative learning spaces known as X-Space. Designed with the new generation of learners in mind, these new learning spaces provide students with student-friendly environment that are engaging, collaborative and flexible, thus able to provide students with the opportunity to acquire the 21st century skills. Ever since the introduction of its first X-Space in 2012, Taylor's have now transformed 52 of its classrooms into these collaborative learning spaces. Started with one X-Space with HDMI and VGA connection, these X-Space classrooms have also gone through different transformational phases. Mobile X-Space is the latest addition to the X-Space classrooms. Mobile X-Space is designed with similar facilities as the other X-Space but without the fixed furniture. Tables are replaced with node chairs that are highly mobile. This will enable the academics to configure their classrooms easily, thus making formal learning spaces more flexible to support multiple learning modes.

Key words: *Learning Spaces, Collaborative Learning, Flexible Learning.*

3.0 Introduction

X-Space collaborative classrooms are initiative by Taylor's University to address the needs to prepare students with the 21st century skills (Taylor's University, n.d.). These X-Space classrooms are designed in such a way that it will provide conducive environment for the students to learn and develop the skills required. Leveraging on the advancement of the technology, these X-Space classrooms are also equipped with projection televisions to project students' works. The design and the features available in these X-Space classrooms have prompted for different ways of learning. Lecturers are no longer the main source of knowledge, and their roles now are more towards facilitating the learning process (Brown & Adler, 2008). With this in mind, X-Space is introduced where traditional tutorial classrooms are transformed into the innovative collaborative classrooms which focus on student-centred learning (Han, Leong, & Nair, 2014).

In order to support and keep up with various students' needs, these innovative learning spaces have also gone through various transformational phases. When the first X-Space was developed in 2012, the tables were hexagon, and students were also connected via HDMI and VGA. However this type of X-Space proved to be costly and not practical to be duplicated. With the lesson learnt from the first X-Space, the latter X-Space classrooms were built with HDMI connection which was proven to be more economical and sustainable. The transformation of these X-Space classrooms has also involved the connection from

cable to wireless connection when Apple X-Space was introduced during the fifth phase. Mobile X-Space classrooms are the latest addition to Taylor's X-Space collaborative classrooms.



Diagram 1: Learning Spaces Revolution at Taylor's University

2.0 Description of the Product

These Mobile X-Spaces are built to enhance the features of the previously developed X-Space classrooms with a total flexibility in mind. Compared to the previous X-Space, these Mobile X-Space classes offer the same facilities as the other X-Space classrooms, but without any fixed furniture. Round tables are now replaced by node chairs and even the projection TV stands are moveable. All these features have been designed in such a way so that it will be able to provide an ideal learning environment for students as it prepares them with 21st century learning environment. This Mobile X-Space has been designed with the aims of providing conducive learning and teaching environment that will:

- Promotes and develop highly collaborative learners
- Supports alternative learning paradigms by creating an environment of active, involved, and exploratory learning.
- Leverages on interactivity tools and technology-rich learning spaces to engage students and improve the quality of their learning.
- Encourages cooperation, exposure to and acceptance of cultural diversity.

These Mobile X-Space classrooms have been important contribution to the way students learn. It has transformed the way students learn. Flexible class arrangement can be easily adjusted to support different learning modes. This allows for the lecturers to use different class arrangement to suit different teaching strategies. Different class arrangement and the flexibility to move around has also promoted peer learning activities. This has made highly collaborative activities possible which will also support cognitive, affective and psychomotor activities. Technology supported learning available in the Mobile X-Space classrooms have also enabled different types of teaching being implemented. Lecturers are able to leverage on technology and try out different teaching method such as flipped classroom that will promote deeper learning among students.

These Mobile X-Spaces have huge potential to function as the learning laboratories. Different learning modes allowed in the Mobile X-Space made potential learning and teaching approaches can be experimented in this innovative learning space. Survey conducted among students has also indicated the following results on teaching and learning in Mobile X-Space:

- Conducive for teaching and learning - 89%
- Emphasis Active Learning – 92%
- Develop highly cooperative learners – 89%

Seeing the potential of this Mobile X-Space, Taylor's has decided to transform more classrooms into Mobile X-Space. To date, out of the 52 X-Spaces classroom, 13 are Mobile X-Spaces.



Please click [this](#) link to get more information on Mobile X-Space.

Acknowledgement

This project is initiated by Taylor's University and managed by e-Learning Academy@INTELLECT.

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ID NO. UiTM 001
TOPIC: Cybergogy for Entrepreneurship 2.0
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Abstract: With the rapid progression in the PC and multimedia technologies, it has become feasible to integrate multimedia technology into the teaching and learning process. What has been the conventional teacher-centred approach is now seeing a shift into one, which emphasises on student-centred learning. Traditional educational content can now be transformed into interactive multimedia content by using authoring packages. It has enabled the teacher to innovate his/her instructional design by presenting the educational content in an interactive and multi-sensory manner rather than the traditional single media format. This infusion of multimedia into teaching and learning has altered instructional strategies in educational institutions. This is an innovation using interactive multimedia educational content on students' learning. The subjects are for the students of UiTM Cawangan Melaka Kampus Jasin, Faculty Computer Science and Mathematics who undertake the Principles of Entrepreneurship (ENT 600) subject via interactive media platform which can be reached at: www.digitent.com.my. It also applicable to the students at National Autism Society of Malaysia, Early Intervention Centre in Melaka.

Key words: *cybergogy, entrepreneurship, digital campus*

Overview

With the advent of this pervasive information technology, many colleges and universities, including those in Malaysia, are currently gearing their teaching and learning towards one, which uses multimedia technology to enhance the student's learning process. With the availability of the devices stated launched on line, interactive learning instructions can be delivered to the learners in an asynchronous learning environment.

In Malaysia, students with autism are increasingly enrolled in schools by their parents. With more students with autism enrolling in schools, there is also the concern that they might fall behind academically. Enormous effort goes into teaching language to students with ASD. That effort, though, is focused almost exclusively on spoken language. Minimal work however is directed towards teaching the other form of language that is central to human communication namely, reading language. As a result, literacy in the ASD population is seriously constrained, often to the point of non-existence. Many ASD students who do not show independent mastery of reading are given instruction, generally in the form of bits and pieces of a traditional reading curriculum. It stems in large measure from the major system that dominates the teaching of reading namely phonics (which concentrates on sound analysis). The attempt to educate ASD students via this system is basically unsuccessful.

Teaching literacy to ASD children requires educators to determine their needs. Literacy is comprised of many components, such as oral language, phonological awareness, phonemic awareness, letter and word identification, fluency, vocabulary, and comprehension. For most ASD children, they are able to achieve phonological and word level recognition but they are not able to associate the word they see and the real objects. For ASD students to become literate, it is vital to move beyond the phonic technique and instead provide them with a system that will permit literacy acquisition and demonstration.

A key difference between a reading programme for normal students versus that for ASD students is that a normal student can be assumed to understand a broad range of spoken language and therefore the meaning of many words does not have to be taught to them. By contrast, with ASD students, the meaning of most words must be taught. A key part of a literacy system to teach an ASD student is not to

simply teach them to read but to have them to begin to understand the words of the language. Furthermore, comprehension needs to be taught so that the autistic child learns the words that they see and the words that they hear are equivalent. Many frameworks for teaching literacy exist and are evolving. Technology has also added a new dimension to teaching literacy. It is important to incorporate technology in teaching literacy to ASD students like e-content especially for entrepreneurship subject. Entrepreneurship is crucial for them to ensure the survival of the special students to face the real world.

By using HTML 5 and google drive as platforms. The product has been implemented since 2017 and completed. A set of instructional materials was developed, implemented and the learners' perception and attitudes towards the use of these multimedia-learning instructions recorded. Furthermore, the changing roles and the relationships between the learner and teacher in this interactive learning environment were studied.

Currently, the platforms only been using by UiTM Cawangan Melaka, Kampus Jasin, and at the National Autism Society of Malaysia, Early Intervention Centre in Melaka. In the near future, we had collaboration with Universiti Brunei Darussalam, Politenik Brunei Darussalam and Osaka University, so that it can be widely used. It can reach it maximum potential and capabilities by the year 2018.

Acknowledgement

"So verily with every difficulty, there is relief. Verily with every difficulty, there is relief" [Al-Inshirah 94:5-6]. No words can illustrate my utmost gratitude, appreciation and respect for my project advisor, Dr. Irzan Ismail, who has professionally inspired me to become the person that I am today. Without his continuous guidance, I will not be able to fathom the significance of critical reasoning, as well as discover my strength as an independent researcher. He saw the potential in me that many others did not, and has never ceased believing in me and what I am capable of accomplishing. I am also indebted to the collaborators who have joined forces in lending their expertise. We started as colleagues, but I am honoured now to be able to call them my friends. Thank you from the bottom of my heart to Dr. Abdul Rahim Ridzuan and Helmy Fadhlisam Abu Hassan.

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ID NO. UiTM 002

**TOPIC: MEDICAL ULTRASOUND ONLINE COURSE
– bringing the classroom to people**

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Abstract: This manuscript introduces massive open online course (MOOC) of basic medical ultrasound technique for selected human body systems. It serves as a supplementary teaching method for medical/radiography students or targeted participants to learn the basic knowledge on ultrasound and to equip them with the appropriate skills to perform medical ultrasound examination confidently. Furthermore, this course may serve either as an ultrasound technique introduction guide or a revision material. We hope to empower the participants' understanding and technical skills in performing ultrasound from this online course.

Key words: *ultrasound, medical imaging, online ultrasound technique, MOOC*

Content:

Ultrasonography is a diagnostic technique that can be used medically. Ultrasound is acoustic energy in the form of waves with the frequency above the capacity of human hearing range. In medicine, it is used to visualise and examine internal body organs or structures. In comparison to other medical imaging methods, ultrasound has several advantages. It provides images in real-time, portable (allowing bedside examination to be carried out), relatively low in cost, easy to use and does not involve potentially harmful ionising radiation.

Medical Ultrasonography Online Course provides basic knowledge and skills required to perform basic ultrasound examination. The course is divided into 6 modules, led by 6 Radiology Specialists/Lecturers. Each module contains course objectives, lecture notes, slide presentation, video demonstration and quizzes respectively. This is to ensure interesting and engaging learning process. There is also Q&A forum available to ask any related questions or for further discussion.

Objectives of the course include:

- 1) To acquire the knowledge of basic principles underpinning medical ultrasound
- 2) To learn the comprehensive patient preparation and care prior to and during the ultrasound examination
- 3) To acquire the knowledge and correct technique to perform ultrasound of the:
 - i. Renal system
 - ii. Hepatobiliary system
 - iii. Thyroid
 - iv. Carotid arteries
 - v. Deep Venous System of the Lower Limb



Importance to education

Lecturers: Novel way of teaching in addition to textbook, didactic lectures and direct hands-on method. Able to reach out and educate students from all over the world, with no border or time-zone constraints.

Students: Students from all over the world can acquire skills and knowledge anytime, anywhere. Furthermore, students can observe the ultrasound imaging technique repetitively or pause the playback video recording when necessary. It will also encourage learning together in study groups.

University: This course will complement the process of teaching and learning and subsequently improve students' understanding and performance. Furthermore, the university and Malaysia will be recognized internationally and henceforth encourage international enrollment to the university courses in the future.

Advantages towards Education & Community

This course is an alternative method of learning in the form of static and real-time teaching where it can be assessed from any location, via computer, tablet or even a smart phone with internet connection. It promotes the process of teaching and learning effectively through understanding the basic concepts, combination of visual exposure on the technique and repetitive observations. This will motivate the students to independently practice the ultrasound techniques. The knowledge and techniques can also be taught to the general public, to pick their interest and engage them with this exciting e-learning method. From the course feed and questions/answers section, the students may interact and ask questions to the lecturers, and vice-versa. This encourages further learning and discussions of the subjects involved, and hopefully brings greater satisfaction to the course participants. This course is supporting the concept of paperless society.

Potential Commercial Value

An online course fee can be introduced for the participant, where participant will be given certificate of course completion (Figure 1). Moreover, participant may be subjected to practical exam to complete the course. Potential participations are by local and international students from medical, radiology and radiography fields.



Figure: Image of selected webpages of the online course with examples of course information and objectives, module icons, lecturers involved, certificate of completion and online comments from participants

Acknowledgement

We are grateful to the UiTM Medical Specialist Center and UiTM Faculty of Medicine for providing us an ultrasound machine to assist in our MOOC major content development. We are also grateful for the help and participation of healthy subjects as our volunteers in this project. Lastly to our respectful cameraman who took credible learning photos and videos.

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Abstract:

With the increasing demand on the usage of mobile internet among students, the use of educational web tools has offered educators to integrate their traditional revision styles to suit the students' learning preferences based on online instructions. In response to this need, an online revision application for Fundamental Physics I (PHY130) course has been designed and deployed by using i-Spring software known as FBD-4u. The study was conducted on the students at Universiti Teknologi MARA, Negeri Sembilan Branch. FBD-4u is an application that can be accessed through mobile phone and computer with the using of ADDIE model as a guideline. The aim of this project are to integrate the use of technology on the previous FBD ruler and offer the students with the online-based learning approaches. Students can access FBD-4u with their own mobile phones. FBD-4u consists of a 3 situations of objects diagram: horizontal surface, incline surface and pulley system. For each objects diagram given, the students need to select direction of forces needed to form a complete free body diagram. Once the student submitted the answer, FBD-4u may check and respond the answer given. Therefore, FBD-4u supported the new teaching era in Universiti Teknologi MARA by implementing 'Week Without Walls' (WWW) because FBD-4u has proven a different style in conducting revision and helps to increase students' understanding in learning Physics in a more interactive way.

Key words: Educational web tools, ADDIE model, i-Spring, Newton's Law, FBD

Background of Innovation

Lecture is a simple, fast and cheap method to present the vast issues to a lot of groups of learners. Based on our experience, lecture-based format of teaching alone is often insufficient to promote students understanding in the Newton's Law concepts. Best practice might involve offering courses that employ a variety of teaching styles. Hence, the development of e-learning content as educational resources has become the most powerful medium in promoting abstract thinking and improving performance from the students.

E-Learning refers to the educational system in which educator and trainees are separated by physical distance but with the help of technology, equipment and tools they are linked together. However, more research is needed to understand students' perceptions concerning the use of tablet devices in an educational context.

Adapted from FBD Ruler 2.0, we developed a mobile phone and computer application known as FBD-4u. FBD-4u is an online step by step revision focusing on Free Body Diagram (FBD). FBD is a diagram used to solve Newton's law problems by constructing several forces acting upon an object in a given

situation. This project aim is to integrate the use of technology on the previous FBD ruler and offer the students with the online-based learning approaches.

Methodology

The FBD-4u deployed by using i-Spring software with 3 levels of questions. Level 1 was a theoretical question, Level 2 was to test the students' understanding of selecting type of forces for the given questions and Level 3 was to construct a complete free body diagram. FBD-4u consists of a 3 situations of objects diagram: horizontal surface, incline surface and pulley system. Within 15 minutes, student need to answer nine questions consists of: 2 questions in Level 1, 3 questions in Level 2 and 4 questions in Level 3. After submitted all the answers, FBD-4u may gave a response for each questions.

FBD-4u used ADDIE model as a guideline. ADDIE model is an instructional model which is valid for any kind of education that provides an organized process for developing instructional materials. It contains five phases; A-analysis, D-design, D-develop, I-implementation, and E-evaluation. By following these five-step, it helps us to develop an interactive interface and exercises with various interesting figures as to provide a quick way for students understanding.

Importance of Innovation

- Free Body Diagram for You (FBD-4u): simple online revision application that offers an interactive visualization of Newton's law concept, prompt response and encourages student's active learning through exercises.
- FBD-4u provides immediate confirmative response for the correct choice or corrective response for the incorrect answer choice.
- FBD-4u accessible on all devices (desktop (Windows/Mac) or mobile (android/iOS/Blackberry)).
- FBD-4u attracts student's interest to learn.

Advantages of Innovation

- Reduce educators' marking time – results can be obtained promptly after the games completed.
- Replace written exercises and revision with games-based format.
- Increase learners' active learning through participation and involvement.
- Create interesting and meaningful learning environment.
- Review students' knowledge and understanding.

Commercial Value

FBD-4u is a game-based learning platform, used as educational technology. The tool is currently free, openly access to participate and access the application. In general, the introduction of tablet devices entails a shift in the way students learn, as the devices provide interactive, media-rich, and exciting new environments.

Recognition

- Silver Award in BiiDE 2018
- FBD Ruler 2.0 : MYIPO APPLICATION NUMBER : LY2018000622
- Certificate of Participation: Introduction and Basics of Learning Design for Academic Staff.

Acknowledgement (if any)

This project is a collaboration between Universiti Teknologi MARA Negeri Sembilan and Universiti Teknologi MARA Negeri Johor. We would like to thank the students of UiTM Negeri Sembilan from Diploma in Textile Technology for their time, support and feedback on all activities from the beginning to the end of survey. We would also like to acknowledge our colleagues at School of Physics & Material Science for their



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ID NO. UiTM 005

TOPIC: "Calculus Quiz Game: Rules of Derivatives"

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Abstract:

Currently the failure rate in mathematics courses is high among university students. Some of the researcher has done the research to identify the causes of the high failure rate in this subject. According to lecturer feedback, students are basically weak in a basic foundation of Mathematics and do not really understand the basic concept of differentiation. Aside from that, the problem can be seen among students are the difficulty in identifying the type of function in differentiation and difficulty in identifying suitable method to solve a particular problem. This study aims to introduce applications games to identify the type of function in differentiation, thus facilitating the students to determine the method that can be used to solve the function in differentiation. This study only focuses on the chain rule, product rule and quotient rule in differentiation. By using this application, it can help students to recognize the types of function and at the same times the rules of differentiation that can be used before they solve the problem.

Key words: *Derivative, Chain rule, Product rule, Quotient rule, Rational function.*

Content

Derivation is an important concept in mathematics for undergraduate students in university in order to learn other concepts in the different fields of studies (Tall, 1992, 2004). Students has a difficulties in the learning of derivation are caused by their lack of conceptual understanding (Tall, 2011). By referring to the statement, the aim of this study is to give better understanding of the right way of differentiation related to rules and functions by using "Calculus Quiz game: Rules of Derivatives" computer software application. To obtain the goals, the students will experience learning derivation through this quiz game after classroom session considering the use of computers in education can be utilized as a new technological support for the visualization of concepts through computer-generated virtual representations (Brandt, 1997).

Figure 1 shows the conceptual understanding of the basic differentiation related to rules and functions is applied in the Quiz game. This quiz game has 30 questions including logarithmic, trigonometric, algebraic and exponential functions that they already learned in calculus class. The first step is student login to quiz game. It is required to login students username, matrix number and password for keeping track the data of each student then they will select the quizzes. For each quiz game, they required identifying the types of functions and the rules applied related to each functions. They have to differentiate correctly based on their understanding about the concept of function in differentiation according to u and v . The marks will be appear after completely answering each quiz and will be record for analysis purposes. This will help students in examining the right way of differentiation according to the conceptual understanding of the function in derivative. There are

This quiz game provides an alternative approach for motivating students towards Calculus subject specifically in derivation involving functions. It is an educational software component, specializing in derivation related to rules of differentiation and types of functions concepts. It presented through applications conceived an interactive, informative and functional oriented learning concept towards

students. The architecture of this computer software application integrates interaction process learning through an interactive interface, easy access mechanisms including content, layout and appearance.

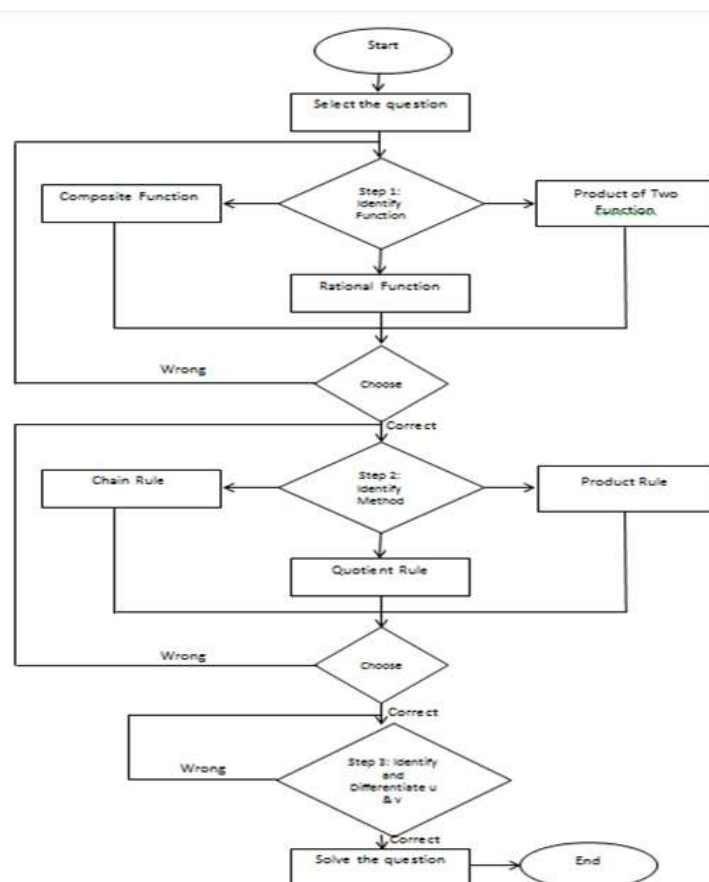


Fig. 1 Conceptual model for an interactive derivative game computer software application.

The Calculus quiz game is intended to provide learners with a personalized work-space learning, in which they enjoy the freedom to explore, learning and understanding the concept of differentiation and functions according to their syllabus in calculus. Therefore, the interactive derivative game for computer software application is designed so that learners can adapt the learning environment interface in accordance with their different learning styles. This computer software application is viewed as an aid in learning derivative and also as a motivational tool for students.

Acknowledgement

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ID NO. UiTM006
TOPIC: "Heutagogy Approach: Exploring Statistics in MOOC.

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Abstract Basic statistics knowledge is very important especially for researchers because it helps them to use proper methods to collect the data, utilize the correct analyses, present the results and make appropriate decisions. This Introduction to Statistics course is primarily created to facilitate those without prior knowledge in basic statistics. The use of interactive notes and educational video clips, online educational games as well as online assessment enables students to learn this course interactively. It also includes professionals and expertise's viewpoints making this course relevant in today's perspective. Massive Open Online Courses (MOOCs) are considered to be a new extension in online learning that have appeared as a popular mechanism for massive amount of independent learners to gain new knowledge and skills. Developing learning environments for massive amount of learners is quite challenging since it occupy variation of participants in terms of background, skills, and also experiences. From previous research, there's enough evidence to say that MOOC is one of a popular instrument to adopt both current and future learning needs. However, one of the challenge of online learning without totally support from instructor requires learners to self-enthusiasm and will led to the low completion rates of MOOCs in the future. Based on previous literature related to online learning implementation, factors such as enjoyment and interactivity have been identified to increase the continuance intention on MOOCs. Specifically, this study aims to improve the features in this MOOC - Introduction to Statistics that can contribute to the students' intention to continue using MOOCs based on a heutagogical approach.

Key words: MOOC, online learning, statistics, continuance intention, heutagogy,

Content

MOOC – Introduction to statistics is equipped with multiple teaching materials designed to lure learners to stay connected to the digital learning environment. As such, online educational games, linked apps for android users and many more are applied in this course. Additionally, learning notes, multimedia presentations, interactive games, innovative discussion, fun quizzes and videos featured in the course were meticulously crafted to ease learners' understanding about each topic as well as facilitating their overall learning processes. The best part is that this course is accessible via computers, tablets and smart phones; thus allowing e-learning to take place anytime and anywhere.

Figure 1 below, shows the process of learning through MOOC – Introduction to Statistics. There are 6 main topics included which mapping to the course learning outcomes. Students will learn through an interactive notes then will self-evaluated themselves by answering the quizzes from each topics. The marks from the quizzes will be notified through email. Besides that, there also a room for communication between facilitators and learners and also between learners themselves which will encourage innovation and invention of new ideas and opinions based on knowledge



Figure 1 Process of learning through MOOC – Introduction to Statistics

For the past few years, blended learning or interactive learning has emerged to become a prominent role in teaching and learning, especially in higher education institution. Because of analysis for the past final exam results has been found that there is a high failure rate in the Statistics subject, leading an enormous number of the students to repeat the subject. Therefore, the main objective of this Massive Online Open Course (MOOC) is helping educate students gain a better understanding of the statistics concepts. However, according to Jordan (2013), one of the major problems in MOOCs is the completion rates of the learners who register the courses is very low. This then put the effectiveness of MOOCs in education field into question. By definition, completion rate is calculated based on learners who enrol and earned a certificate after completing the course (Jordan, 2013). One of the factors that contribute to this problems is unstable internet connection and lack of students' engagement towards MOOC. Later, Mohammad, Ibrahim, and Abdul Rahim (2018) suggested to include interactivity and enjoyment factors in MOOCs since both of the factors are highly correlated with the continuance intention to use MOOCs among Malaysia students. In line with that, we are trying to engage students constantly via digital learning environment adoption by developing a mobile application that can improve the effectiveness of the MOOC.

Through various free and interactive online learning activities designed within the course, students are not only able to be engaged with the theory aspects of basic statistics, they are also to learn new knowledge from the sharing of multiplicity views in their global class settings. The commercial value in terms of marketability is this MOOC designed to develop basic knowledge statistics for students who are taking diploma or degree programs in business studies, business insurance, banking, marketing, public administration, accountancy, hotel management and tourism, applied science, computer science, quantitative methods, statistics, actuarial science and engineering programs in institute of higher learning. They will have a wonderful time and learn a lot about the basics of statistics in a way that is fun and easy to understand. In terms of profitability, this MOOC has been utilized as platform to convey the Apps for "Faststatistics Notes" and "Easy Statistics Game". Students can download these Apps after they completed the process of learning MOOC. These Apps just accessible to certain topics and quizzes and other than those students should pay for certain amount

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lecturers, participants and users that choose to join and download our product. Our product and innovation will not expanding without them.

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ID NO. UiTM 007
**TOPIC: MOOC: DISCOVERING THE WORLD OF SCIENCE
AND TECHNOLOGY:INSPIRING ENGLISH LEARNING!**
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Abstract: Massive open online courses (MOOCs) are a recent development in online education aimed at unlimited participation and open access in facilitating learning and communication via online classes. They are a potentially disruptive technology; changing how education is delivered and funded around the world. Recently, it has emerged as a popular mechanism for independent learners to acquire new knowledge and skills. Thus, this invented online course is designed to provide undergraduate students with four language skills; listening, reading, speaking and writing skills and it will help students to perform effectively and competently in social and academic contexts. This online course has various current and appealing topics, notes, activities, quizzes and enrichment pertaining to the field of science and technology. This invented online product is also specially designed with various multimedia and graphic elements. It is expected to produce the full potential of talented students with a great self-learning experience and empowering governance among universities, e-learning, lifelong learning and global learning.

Key words: massive open online course (MOOC), science and technology, language skills, learning

Introduction

There is growing interest in the adoption of open educational resources (OER) and open educational practices (OEP) in a variety of contexts. Massive open online courses (MOOCs) provide opportunities for learners to benefit from initiatives that are promoted by prestigious universities worldwide. Pappano (2012) explains, the shimmery hope is that, free courses can bring the best education in the world to the most remote corners of the planet, help people in their careers, and expand intellectual and personal networks. The introduction of MOOCs in 2008 has since then transformed education globally. The term Massive Open Online Courses (MOOC) was originally coined in 2008 by Stephen Downs and George Siemens and came into broad use in 2012 (Johnsont et.al 2014). Thus, massive open online courses (MOOCs), which also grew as part of the open education movement, provide a feasible means for this purpose. Generally, MOOCs should be considered as follows:

- Valued as natural part of universities' course offerings
- Valued as valuable learning and educational initiatives
- Recognized as valid courses taken at learners' own universities or from other providers
- Valued as pedagogical innovations
- Valued as change agents and facilitators in the transition to opening up education
- Valued as fostering innovation, access, equity, inclusion
- Valued as lifelong learning opportunities and continuing professional development
- Included in quality enhancement and quality assurance processes

Therefore, this paper points out, the development of MOOC for English for Foundation Studies 1 and the merits of the innovative use of this MOOC in order to improve the proficiency level of Foundation in Science program for pre-diploma students at Universiti Teknologi Mara (UiTM). This open online course is designed to build the listening, reading, speaking and writing skills, as well as help students perform effectively and competently in the social and academic contexts. This is done through the integration of

these four language skills. This MOOC focuses on enhancing the students' abilities to use the language by exploiting a variety of materials in varied situations. Besides that, appropriate consideration is also given to the development of higher-level grammatical construction, vocabulary expansion and extensive reading activities that are intended to increase students' lexical density. This online course also has various current and appealing topics, notes, activities, quizzes and enrichment pertaining to the field of science and technology.

Designing and Developing of a MOOC Project

The ADDIE framework (Figure 1) was used as a framework for developing this MOOC project. This framework is a cyclical and iterative process consisting of five stages: analysis, design, development, implementation and evaluation. According to Peterson (2013), in the analysis phase, the main consideration is the target audience (MOOC students) and the determination of what they know and what they need to know by the end of the course.



Figure 1: ADDIE Model

During the design phase, course developers determined the learning outcomes or objectives of the course, how the objectives will be met, how they will be assessed, and the methods that will be most effective in the delivery of the objectives. Students' participation during the design phase can contribute to their overall course satisfaction and plays important role in determining whether students continue participating in a course (Murphy, 1999). For the implementation phase, course developers, learners and the instructors actively work together to analyse, redesign and evaluate the course and make instantaneous modifications to the course to ensure effectiveness. Finally, during the evaluation phase, the course designer must determine if the objectives have been met, evaluate the impact of the course through summative and formative evaluations, and make changes necessary for future delivery of the course. To develop this course, a full design team was gathered at the onset of the project and included a project leader, course developer, instructional designer, graphic designer and video production team.

Analysis Phase

At the beginning of the analysis phase, Institute of Neo Education (INED) Universiti Teknologi Mara determined the goals of the MOOC. Ultimately, the following goals were identified that aligned closely to the University's larger mission. Firstly, the MOOC is to provide teaching on free-of-charge basis. Then, it was decided that MOOC would be used as a way to brand and publicize the university through logo placement, video clips recorded in the campus and a standardized promotional video by university.

Design Phase

The production team decided that the course would comprise of ten units (usability, user-centred design, ADDIE process, evaluation and testing, and web designing) that included a variety of ways of presenting information. All units were to have notes, activities, quizzes, enrichment and references sections pertaining to science and technology topics. The introduction unit was designed to include an introductory video with project team members as presenters, guiding users through the content of this MOOC on an overall basis. Other than that, a written transcript is provided in this video. As for the other

ten units, they were designed to include notes by using Prezi presentations and youtube, activities and enrichment by using Powtoon, quizzes by using multiple-choice questions, fill in the blanks, crossword puzzles and so on.

Development Phase

Creating the video was a high production affair for the introductory video. The video production team was involved in this video recording . Figure 2 shows a screen shot of the introductory video for this MOOC project.



Figure 2: Introductory Video

The video was filmed and edited by the expert video production team. The high-end video equipment was used during this session. The team members also prepared a video transcript that was included in this video session. For the development of other units, all team members were needed to attend a MOOC workshop that was organized by the iNED at Perak branch campus for six sessions which started in February up till June. In this series of workshops, the team members learnt about storyboard development, Powtoon and Prezi, youtube channel, assessment and quizzes, montage, kudos and badges. Thus, the team members used these lessons learnt for developing all units in this MOOC.

Implementation Phase

The Mooc begins with an introduction page where prospective learners can gain a clear overview of what the course has to offer. Learners are presented with notes, activities, quizzes and enrichment for each unit in this online course. Besides that, learners are provided with discussion board for threaded discussions. All learners are also provided with kudos and badges for them to receive once they start using this MOOC and when they complete the units in this MOOC. All learners will also be receiving a Certificate of Completion after they have completed this online course.

Evaluation Phase

Throughout the MOOC design and development, the usability process reflected the evaluation in the ADDIE model, which required that the production team constantly evaluated in terms of how they were doing.

Importance of MOOC Project

In order to work towards nation-building, as well as establishing national identity and national unity, it is a common experience, or rather a practice to make language policy decisions, to make choices about official and national languages, to consider the role of language as a nation-building tool. However, in a country where indigenous languages, as well as Chinese, Tamil and Malay, all strived for a role, English was rejected at independence. Instead, Bahasa Malaysia was adopted as the national language after achieving independence from the British in 1957. Nevertheless, as time passed, the commitment to Bahasa Malaysia did not appear to be delivering on the front that "one contribution a national language can be expected to make towards national ambitions of modernization" (cited in Macalister, 2017). Hence, the government of Dr Mahathir Mohammad launched new initiatives. One such was the decision to have Mathematics and Science taught in English in all state schools in Malaysia from 2003 (the ETeMS project, or English for Teaching Mathematics and Science). Many other measures were taken thereafter to ensure that English stood by Bahasa Malaysia as well as though the ETeMS project had gone away.

This is evident in the Malaysia Education 2013–2025 Blueprint, in which one of its intentions is to "ensure every child is proficient in Bahasa Malaysia and English" (cited in Macalister, 2017). Although English was viewed positively, and proficiency may not present obvious barriers among Malaysians, however, it is believed that positive attitude and aptitude towards accepting the English language as a subject capable of being cross disciplinary may not have been met. The English language is still perceived to be a language worth learning only for grammatical aspects and nothing else. There seems little realization that being proficient in English not only 'brought privileges, esteem and wealth' (Hanewald, 2016: 183) but in this era of transnationalism, a content-based approach to language learning, enables "students to acquire proficiency in English while learning the content (Science and Technology)" (Hall, 2015: 154). Besides, the consensus in the literature is that such content-based approach to language learning and teaching experiences (multidisciplinary) are transformative, in that they can contribute to students' and teachers' personal attitude and aptitude towards the language learning and teaching as well as in developing inter-discipline awareness.

Advantages of MOOC Project towards Education and Community

Before turning to explain the advantages of our app development, it is best that what does community mean in the aspect of education is important. Communities can be generally defined by characteristics that the members share, such as culture, language, tradition, law, geography, class, and race. In the aspect of education, Bray (1996) presents three different types of communities, applied in his study on community of education. The first one is geographic community, which is defined according to its members' place of residence, such as a village or district. The second type is ethnic, racial, and religious communities, in which membership is based on ethnic, racial, or religious identification, and commonly cuts across membership based on geographic location. The third one is communities based on shared family or educational concerns, which include parents associations and similar bodies that are based on families' shared concern for the welfare of students (Eumura, 1999).

Based on this understanding about communities in education, we proudly present various advantages of this app entitled ELC 080: "Discovering Science & Technology : Inspiring English Learning" to these levels of communities.

The Information and Knowledge Society has emerged as a result of technological advancements of the World Wide Web, the Internet and mobile communications over the last few decades. This Malaysian MOOC project which involves Science and Technology discoveries through English Language directly impacts every aspect of our personal and social life with the assistance of these technological advancements; thus changing the way we communicate, collaborate, work and learn. This is an advantage as we have used numerous interactive narratives like YouTube videos, online games like puzzles and quizzes, and listening activities. Any geographic community across borders that is concerned with learning English Language effectively using the content-based approach and technology, have access to our MOOC project via the Open Learning website.



Next, in terms of advantages to the ethnic, racial, and religious communities, this MOOC project of ours serves all communities across ethnic, racial and religious backgrounds as the content varies socially and academically in contexts. This is done through the integration of the language skills and exploitation of a variety of authentic materials in varied situations that are derived from multi-social contexts worldwide. Finally, in terms of the communities based on shared family or educational concerns, which include parents associations and similar bodies concerned with students' educational benefits, this MOOC project serves as a platform that provides a content-based approach to learning the English Language via interdisciplinary contexts of the Sciences and Technology. In other words, this project is advantageous in building the listening, reading, speaking and writing skills to help students perform effectively and competently in the contexts of Science and Technology through the various authentic materials involving variety of Science and Technology-related topics. This is done with focus on higher-level grammatical construction, vocabulary expansion and extensive reading activities besides interpreting and responding to authentic listening discourses. Analysing and writing essays based on information from non-linear texts as well as linear texts from various Science and Technology based topics using grammatically correct structures also are part of the strategies used to serve the educational benefits. This includes responding to given stimuli involving interdisciplinary contexts of the Science and Technology field by speaking spontaneously and effectively.

Commercialization Potential of Product

Our main aim is to develop an innovative, open and massive Science and Technology virtual learning environment through this MOOC project, which integrates modern technologies (OpenLearning website) with the focus to create an open technology-enhanced classroom that builds on the strengths of content-based approach to English Language learning and teaching. Hence, this MOOC project was designed.

This project is highly valued as a natural part of UiTM's course offerings (for the ELC 080 course) and recognized as a valid course taken at UiTM. Due to this quality, and its various interactive narrative elements and language skills integration in each unit of our MOOC project, it will not only be marketable, but also profitable as an on-demand online course, especially to those enrolling at UiTM for this course and for all undergraduate students who are involved in the science and technology field as their major.

Besides that, this project can be valued as a pedagogical innovation that fosters access, equity and inclusion at all levels of teaching and learning worldwide. This is because, within an environment of stubbornly high unemployment, and ridiculously expensive education, this free MOOC project is able to close these gaps. This is believed to be a trait that will encourage education profitability. Besides, in the future, we believe that as the private four-year education is becoming difficult to afford, with prices rising faster alongside other cost-of-living expenses, including healthcare, new buyer segments will pay a smaller price for an on-demand online course as ours. We are highly confident that UiTM is not likely to neglect these potential customers. This MOOC content also applied for IP copyright and still under process to make sure all contents in this MOOC project are protected by copyright.

Conclusion

MOOCS are designed for heterogeneous international audience (Matkin, 2014). This situation invites blending of design approaches to meet the needs of diverse learners. In a MOOC, it is expected that the participants will come for information, and not credentials. Hence, the education 4.0 goals will gradually become a reality in the future.

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ID NO. UITM 008
TOPIC: iEXAM @ iNED

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Abstract:

iExam@iNED ialah satu projek inovasi oleh unit peperiksaan bagi menambahbaik dan memantapkan sistem pengurusan peperiksaan di iNED. Sistem ini menggunakan teknologi cloud Google Drive dan QR code bagi mengurus, menyimpan data serta fail berkaitan peperiksaan. Buat masa ini, data yang disimpan ialah senarai Pelajar Tidak Hadir Peperiksaan, soalan dan skema jawapan peperiksaan. Data ini boleh diakses oleh pensyarah dan pemeriksa kertas jawapan menggunakan QR code yang ditampal di setiap sampul skrip jawapan dan di bilik gerakan peperiksaan iNED. Melalui pendekatan ini, akses dan carian kepada soalan dan skema jawapan dapat dipercepatkan. Pensyarah dan pemeriksa juga tidak perlu lagi menghubungi iNED bagi mendapatkan skema jawapan. Bagi pihak iNED pula, kos percetakan dapat dikurangkan kerana soalan dan skema jawapan telah disediakan dalam bentuk digital. Projek ini akan terus ditambahbaik dengan mengintegrasikan Sistem Maklumat Pensyarah iNED bagi tujuan kawalan akses dan keselamatan kandungan digital.

Key words: iExam@iNED; Simple & Easy

Content

Institut Pendidikan NEO (iNED), UiTM telah ditubuhkan pada tahun 1973 dan ia merupakan satu pusat pengajian jarak jauh yang menawarkan pembelajaran separuh masa kepada orang awam untuk melanjutkan pengajian di peringkat Diploma dan Ijazah Sarjana Muda. Sehingga kini sebanyak 13 Fakulti dengan menawarkan 30 program peringkat Ijazah Sarjana Muda dan 11 program peringkat Diploma telah dilaksanakan oleh iNED.

Seiring dengan perkembangan permintaan melanjutkan pengajian, iNED mendapati pada musim peperiksaan terdapat kekeangan dalam melaksanakan tugas dengan lebih efisien dan cepat. Sepanjang musim peperiksaan dijalankan rutin kerja staf bertugas di bilik gerakan peperiksaan meningkat. Tugas yang mereka perlu lakukan adalah seperti menyerahkan kertas jawapan pelajar dan menerima kembali kertas jawapan yang telah disemak, menyerahkan skema jawapan dan kertas soalan kepada pensyarah yang memohon dalam bentuk cetakan, menerima markah peperiksaan (RES/iCGPA) dan menyediakan data senarai pelajar cuti sakit atau tidak hadir peperiksaan dengan kebenaran kepada pensyarah.

Oleh yang demikian, setelah diteliti iNED telah mengambil insentif dengan mereka cipta sistem iExam@iNED. Sistem ini dicipta bagi memudahkan cara proses tugas yang dilaksanakan oleh staf bertugas. Antara ciri-ciri iExam@iNED adalah dapat memudahkan capaian kepada soalan atau dan skema jawapan kepada pemeriksa kertas jawapan peperiksaan. Ia juga dapat membantu memudahkan semakan data cuti sakit pelajar atau tidak hadir peperiksaan dengan kebenaran oleh pensyarah. iExam@iNED juga dapat meringkaskan komunikasi pemohon soalan atau skema jawapan melalui penggunaan teknologi google drive dan QR code. Sistem ini juga dapat menjimatkan masa dan kos operasi peperiksaan iNED dengan pelaksanaan akses soalan dan skema jawapan secara digital. Secara tidak langsung dengan adanya sistem ini pensyarah dapat memuat turun soalan atau skema jawapan secara terus dan menyemak status cuti sakit pelajar yang terkini.

Pada permulaan sistem ini dilaksanakan, sesiapa sahaja boleh mendapat akses penuh tanpa sekatan dengan adanya QR code tersebut. Setelah diteliti dan dikaji semula, penambahbaikan sistem dilaksanakan dengan segera. Pada masa kini, pensyarah perlu memohon kertas soalan atau skema jawapan terlebih dahulu dan pihak iNED akan mengesahkan permohonan tersebut sebelum melaksanakan proses selanjutnya kepada pensyarah.

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ID NO. UiTM 009
TOPIC: M-TRACK: MOOC DEVELOPMENT & EVALUATION TRACKING SYSTEM
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Abstract:

M-Track is a tracking system used to monitor the progress of Massive Open Online Courses (MOOC) development and evaluation by lecturers from all 26 faculties and 12 UiTM campuses throughout Malaysia. The system helps to ensure the standard quality of MOOC is adhered before it is offered to the public. Besides that, it also helps to ensure the duration of MOOC development and evaluation is within projected timeline. The system can generate different type of reports, letters and certificates. The target users of the system are the MOOC developers, MOOC evaluators, MOOC Coordinators, MOOC Managers at the institution and anyone who wishes to develop MOOC.

Key words: MOOCs monitoring, MOOCs development tracking, MOOCs evaluation tracking

Introduction

Currently the Massive Open Online Courses (MOOCs) is one of the most discussed topic in the field of teaching and learning. The number of MOOCs been offered online are appearing to be increasing at a tremendous level. This is because MOOCs are easily to be accessed free or low-cost from anywhere, anytime and any situation (Russell et al., 2013). Central to the opportunities is the discussion of performance monitoring of MOOCs development and evaluation. Monitoring of MOOCs development and evaluation is important to ensure the MOOCs is offered on time to the public. Traditional approach of monitoring the development and evaluation process is by using an Excel sheet and it is time and resource consuming. Understanding the challenges in traditional approach, a system was developed. This study seek to contribute to the development M-Track, a tracking system used to monitor the development and evaluation progress of Massive Open Online Courses (MOOCs) by the developers and evaluators from University Technology MARA (UiTM).

Purpose

The purpose of M-Track development are to ensure the quality of MOOCs before it is offered to the public and MOOCs development and evaluation process completed according to the planned timeline.

Benefits

There are few benefits of M-Track system. M-Track system provides a standard requirement for the MOOCs developers and evaluators to complete the development and evaluation process. Once the requirement is fulfilled, the developers and evaluators will update in the M-Track system. This allow the



administration of development and evaluation progress at all UiTM faculties and campuses simultaneously. Besides that, many automated report can generated periodically to monitor the progress of MOOC development and evaluation.

Conclusion

This study showed the university MOOCs administer found it convenient to monitor the MOOCs development and evaluation progress throughout the UiTM faculties and campuses easily from anywhere. On the other hand, the difficulties encountered by administer using the traditional approach was overcome in the M-Track system.

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ID NO. UTM 010
TOPIC: ONLINE ASSIGNMENT MANAGEMENT SYSTEM
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Abstract:

Online assignment management system is a sub system within learning management system. The functions of the system are to handle the online assignment submission and grading. In traditional assignment management the students have to submit a hard copy of assignment before the due date to the lecturer meanwhile the lecturers need to allocate some space to keep and mark the assignments. The challenges faced by the students in term of meeting the due dates and cost of printing; and lecturers in term of managing time and space for marking has initiated the researchers to develop an online system. This study presents an online assignment management system that was developed to collect, process, and return the assignment marks obtained by a student in course. It can be used to measure the students learning and their achievements; and improve the educational system. The lecturers and students are the two main users in online assignment management system. There are four functions that can be performed by these users in the online assignment management system. Firstly the function that allows the lecturers to upload the assignment questions. Secondly the function that allows the students to upload the assignment answers. Thirdly the function that allows the lecturers mark the assignment answers. Lastly the function that allows the students to view the assignment mark and feedback. Although the online assignment management system is a clear improvement over paper-based assignment submission and grading, this study compared both the methods with respect to the effectiveness in assignment submission. Questionnaire was used to assess the student's perception towards effectiveness of online assignment submission. Results show that the online assignment submission was faster and easier than hard copy assignment submission. The future study will look into the effectiveness of online assignment management system in grading and assessment of student learning performance.

Key words: *online assignment, online assignment submission, online assignment grading*

Introduction

Assignment management involves tasks namely uploading assignment, grading assignment, uploading assignment answers, view assignment result (Quteishat, Al-Mofleh, Al-Mefleh, & Al-Batah, 2011). Management of assignment can be done either using traditional or system approach. Traditional approach require a student to submit a hard copy to the lecturer and lecturer to mark the mark copy. While the system approach is use of ICT to support the submission, grading and return of student assignments (Jones, Cranston, Behrens, & Jamieson, 2005). Online assignment management system provides administration benefits, time and resources savings, removal of geographical imitation, timely delivery of assignment feedback to students and support analysis of learning outcomes (Wahab & Al-Alaiwat, 2015). Understanding the wide advantages in the system approach for assignment submission and grading, a system was developed. This study seek to contribute to the development on online assignment management system for UiTM full and part time students. The developed system provides a structured system for the students to submit their assignment and the lecturers the grade the student assignment.

Purpose, Methods and Results

In this study, online assignment management system is embedded as part of learning management system. This is because assignment is a part of student learning activity. Lecturers will upload the assignment questions in the system, the students then upload assignment answers in the link provided. Once the online submission completed, the lecturers will start grading the assignments. Assignment results or score marks will be available for student once the grading process is over.

Student (n=15) in interactive multimedia part-time class at University Teknologi MARA (UiTM) were given three assignment (one individual and two group). All the assignment work was submitted in softcopy through online assignment management system in i-Learn (UiTM learning management system). Once the assignment is submitted, it is graded by the lecturers in the system. The students were able to see their assignment feedback and result via the system too.

At the end of the semester March 2018, a simple questionnaire was adopted (Wahab & Al-Alaiwat, 2015) and sent to the students via what's app. The questionnaire consist of three question regarding the usefulness of the online assignment submission. The response from the students were collected through what's app too. The results shows that about 80% of the students rated the online assignment feedback (result) to be valuable, 66.7% of students perceived the submission of assignment from anywhere as the most useful aspect of online assignment and majority of students perceived submitting an assignment once as the biggest disadvantage.

Conclusion

This study showed the students of interactive multimedia course found it convenient to submit their assignment online easily from anywhere. On the other hand, the difficulty encountered by the student in submitting the assignment once was overcome in the current design. Further study will consider the effectiveness of online assignment management system in grading and assessment of student learning performance.

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ID NO. UITM 011
TOPIC: LET'S MOOC; TOOLKIT FOR MOOC DEVELOPMENT
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Abstract:

Massive Open Online Course (MOOC) has transformed the conduct of teaching and learning in the higher education institution. Although there are many benefits of MOOC, evaluation of the effectiveness of MOOC is still lacking, hence, raising the issue on the quality of MOOC. Universiti Teknologi MARA has joined the bandwagon on MOOC development since the year 2015 and managed to produce over 600 MOOCs. However, with 500 programmes spanning over 13 campuses and 21 satellite campuses, managing and organizing MOOC development for the whole university is a challenge. Hence, a hub or single reference point is crucial in establishing constant dissemination of information. Let's MOOC; Toolkit for MOOC Development is an online workshop developed by taking into consideration bibliographic analysis in determining best MOOC characteristics and materializing it using a common MOOC platform. The aim is to ensure MOOC produced by UiTM is at high quality without jeopardizing the integrity of the course. Let's MOOC showcase best practices in online teaching for academicians to develop an effective, efficient and to create a satisfying teaching and learning experience for learners. It comprises of theories on online learning, application of blended learning, MOOC development process and materials required to kick start a MOOC. With the use of Let's MOOC, UiTM academicians will be able to produce and publish quality and effective MOOC, henceforth, nurture successful and satisfied online learners.

Key words: Massive Open Online Course; Best Practice; Online Learning; MOOC Quality

Content

Massive Open Online Course is a phenomenon in online learning since 2012. As the proliferation of MOOC in the higher education, Universiti Teknologi MARA (UiTM) started its 15 MOOC project in 2015 and have soon grown into developing over 600 MOOCs in just 3 years. This can be achieve as UiTM has 500 programmes spanning over 13 campuses and 21 satellite campuses. With a sheer number of academic staff, producing MOOC on a massive quantity is not an issue. However, managing and organizing the MOOC is an issue, which if not conducted properly may cause many of the MOOC's offered and created without considering the effectiveness of it (Conole, 2016; Yousef, Chatti, Schroeder, & Wosnitza, 2014; Creelman, Ehlers, & Ossiannilsson, 2014). This cause an alarming concern on the quality of the MOOC produced by UiTM. It was determined one of the reason is there is no benchmark of MOOC best practice and source of reference varies which leads to a different standard of MOOC were developed.

With that in mind, Let's MOOC, Toolkit for MOOC Development is introduce as an online workshop for UiTM MOOC developer that runs in the Open Learning platform. The workshop provides a thorough explanation of online learning, blended learning and teaches ways to design MOOC. It also provides a toolkit to ease MOOC developer in preparing content and designing their MOOC.

Let's MOOC was developed through a bibliographic analysis by critically reviewing 50 papers specifically on MOOC quality. Hence, best MOOC characteristics identified and materialized in the online course. The course emphasizes 13 elements that should be in a MOOC and captures 4 main characteristics of MOOC which is to be engaging, distinctive, outcome based and supportive (MarylandOnline, 2015; Rosewell, 2014; Nina & Allison, 2016).

Let's MOOC aims to ensure MOOC produced by UiTM is of high quality without jeopardizing the integrity of the course. With academicians from different backgrounds and may be lacking in knowledge of online teaching pedagogy, Let's MOOC offers information and teaching on online pedagogy which will further enhance learners experience and ensuring MOOC quality assurance. By doing so, Let's MOOC eventually provide a possible solution that will balance learners goal and through quality MOOC. This deemed pertinent in ensuring the success of MOOC developed especially among UiTM developers. Let's MOOC; Toolkit for MOOC development has potential to be the main source of reference for MOOC developers.



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ID NO. UKM001	TOPIC: ReSt Module using a Four-Steps Approach Based on Case Study Example and Infographic for SPSS Novice Users

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Abstract: The purpose of this study is to presents the design and development of a module which aids in the learning of SPSS data analysis, named 'ReSt' (Research and Statistics). Using software packages to analyse quantitative data, such as SPSS, appears to be challenging amidst unskilled novice users. Prior studies have proven that SPSS novice users face some difficulties in analyzing data correctly for their research purposes. The existing modules that serve as references are insufficiently interesting to promote SPSS learning and does not support on students' cognitive ability. This study was conducted to develop a ReSt module and evaluating the module usability level perception among 78 novice users after the use of module throughout the two-day SPSS basic course. ReSt module had been developed by combining two instructional design models; Addie and Waterfall. This simplified model is called AdWa model beginning with analysis, design, development and testing, and the last phase, implementation and evaluation. As a result, an instructional design model using AdWa is proposed to produce ReSt module with four-step approach based on case study examples and infographic, mainly to assist novice users in analysing quantitative data using SPSS within the actual research context. The four-step approach is an innovation that depicts the flow of research process. The example-based learning was integrated via case study examples into ReSt module to facilitate users in relevant information-seeking processes and to help them to concentrate on studying the problem-solving steps provided. The display of infographic information allows difficult information to be processed in a simple form to enhance the learning process. In fact, the cognitive load theory is a main foundation of the ReSt module design. The finding also showed that the usability level of the proposed module had been high among the novice users, for the contexts of usefulness, ease of use, ease of learning, and satisfaction. It is expected that the use of ReSt module would serve its purpose in guiding novice users to learn quantitative data analysis using SPSS and highly beneficial for novice users as the module design weighed in the novice level cognitive ability.

Key words: *Design and development, instructional design model, SPSS, novice, example based learning, infographics*

Content

Description of your innovation / product development / design / process.

ReSt refers to short form of **R**esearch and **S**tatistics due to both of these two concept are important to learn SPSS. This module was developed in the Malay version for SPSS beginners or novice user targets to help them analyze data using SPSS within their research context. ReSt module can be accessed through Massive Open Online Course (MOOC) for novice user through the url <https://www.openlearning.com/courses/asas-spss>. The ReSt module appears to be an interesting instructional module for SPSS novice users as the presentation of

information is displayed in a simple and easy-to-understand manner. Hence, the ReSt module integrated an intervention of four-step approach, example-based learning and infographics. The design and development of ReSt module is based on AdWa model (combination of Addie and Waterfall Model) was incorporated as an instructional design model (Analysis, Design, Development and Testing, Implementation and Evaluation). This simplified model is called AdWa model beginning with analysis, design, development and testing, and the last phase, implementation and evaluation as shown in Table 1.

Table 1: Phase in AdWa model.

Phase	Description
Phase 1: Analysis	Determine problem and user need
Phase 2: Design	Plan a strategy for accomplishing the problem and user need
Phase 3: Development and Testing	Create the content and test the ReSt module
Phase 4: Implementation and Evaluation	Deploy the SPSS training using ReSt module and measure how well the usage of the module

The four-step approach refers to a systematic guide that facilitates the learning of data analysis using SPSS within the context of comprehensive research that ranges from the study objective until finally, making a review report based on the thesis format. The four steps are meant to guide students in analyzing data step-by-step based on a viable research process, starting from designing a study until report the findings of the study. The four-step such as 'Jom Semak OPIS' is about designing a study, 'Jom Buat KoMTO' is about preparing data, 'Jom Uji KeK' is about test assumption and measurement tools, while 'Jom Buat A&L' is about data analyses. The use of acronyms is a strategy used to better facilitate the novice students in remembering the data analysis process using SPSS accurately. The implementation of this four-step approach is also supported by the disclosure of case study instances that are synonymous with the real world of researches. The selected case study examples help the novice students to understand and to learn data analysis via investigation model. The ReSt module integrated the example-based learning to give exposure to students about analysing data in a realistic situation according to case study instances (see Figure 1). The example-based learning reflects a problem-solving model that consists of three components: problem statement, problem-solving, and final solution for the problem (Renkl and Atkinson 2003). The example-based learning approach helps students to find relevant information via problem-solving steps to build problem-solving schemes (Wittwer & Renkl 2010) in no time (Kalyuga et al. 2003).



Figure 1: Topic of case study example.

The presentation of ReSt module is based on infographics; fewer texts, but more visual to stimulate learning in an attractive manner. Infographics consists of many visual components, such as pictures, drawings, diagrams, symbols, graphics, and texts, which can be used separately or merged for the purpose of conveying information. Innovations brought through infographics are the use of visual components to deliver information and have a unique way of building content (Dick 2013). El-Araby (2008) listed the infographic features as visual description that enhances students' understanding and eases information search; graphic representation that combines appropriate words and pictures; self-explanatory that does not require further explanation; makes the understanding process quick and consistent; focuses on vital clues, and excites the readers.

The context or background of the innovation / product development / design / process

Erroneous data analyses lead to invalid survey outcomes. Mohd Mahzan et al. (2016) asserted that the inability to perform an analysis correctly can negatively affect the research quality. Statistical analysis for a quantitative study is often perceived to be the most difficult step by a novice researcher (Yin et al. 2006). Novices refer to those inexperienced or with limited knowledge regarding situational characteristics of their domain (Ross et al., 2005). Thus, an SPSS reference material is highly sought by novice users to guide them in overcoming the abovementioned errors. Nonetheless, the existing references to quantitative analysis and statistical data are frightening to many students and SPSS reference materials should be more easily understood (Connolly, 2011). Some SPSS references are too brief and give insufficient information regarding data analyses (List 2017).

According to Sun et al. (2006), a module that can reduce the cognitive burden of students is indispensable in the teaching and learning process. Problem-based learning is a combination of example and problem-based learning methods aimed at reducing cognitive burden; whereby in the early stages of knowledge acquisition, novice students should be able to gain more benefits from work-example (Jalani and Lai, 2014b). Meanwhile, infographics help to increase attention span, reduce cognitive burden, offer fun facts, and stimulate the teaching and learning process (Clark and Lyons, 2010). Al-Mohammadi (2017) revealed that the infographics approach was effective in teaching Basic Programming to a group of high school students in Saudi Arabia.

Therefore, the combination of example-based learning and infographics can make a learning module interesting and easy to understand for novice users. As such, a module with four-step approach based on case study examples and infographic called ReSt had been developed. This module was developed in the Malay language to assist novice users in learning quantitative data analysis via SPSS within the real research context.

Why are they important to education?

The ReSt module is important especially in higher education which it contributes to the field of research. The reason is that this module can be used as a reference by novice students to improve their understanding and learn data analysis skills using SPSS in real research context. This module is also expected to reduce problems, such as intricacy of seeking answers to the research questions, inaccurate use of statistical tests, and incorrect analysis procedures, to name a few.

Advantages of your innovation / product development / design / process towards education and community.

The ReSt module is targeted at novice students to analyse quantitative data using SPSS for their researches. This is because; ReSt is a realistic and practical module that offers a comprehensive overview of the students as if the users are carrying out a study. According to Merrigan and Huston (2014) and Kothari et al. (2014), data analysis is part of research process and it involves the use of statistical techniques to summarize and to interpret the study outcomes (Hair et al., 2007). Tendayi Viki (2008) stated that the key to using SPSS is not to understand mathematics, but to understand the research or to better understand the research-based statistical concept.

The ReSt module also benefits the SPSS instructors as the SPSS teaching approach for novice students should be simple to reduce cognitive load. According to Noor Hisham and Lai Chee (2014), novice students lack initial knowledge in domain and they need to be fully supervised, especially during the initial phase of learning (Van Gog, Paas, & Van Merriënboer, 2008). The ReSt module has implication on basic SPSS course because this module can serve as the main reference during basic SPSS courses and workshops. The requirement of this module is important for students or course participants so that they will not miss out on succeeding the basic SPSS course.

Commercial value in terms of marketability or profitability of your innovation / product development / design / process.

The commercialisation potential of ReSt module are related to SPSS training course, data analytics consultant companies, online paid course (eg. Udemy, Open Learning), higher education book store, e-book paid store and Centre for Collaborative Innovation UKM.

Acknowledgement

We are grateful for the support of Center of Research and Instrumentation (CRIM) and Faculty of Information Science and Technology, National University of Malaysia is acknowledged.

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ID NO. UKM003	TOPIC: Long Pole Game: The Integration of visual programming and robotics in learning programming

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Abstract:

The aim of this study is to increase the programming skills in students of secondary and higher education levels by using a module which is developed based on the requirements obtained from STEM (Sciences, Technology, Engineering and Mathematics) teachers throughout Malaysia. The requirements were obtained through a survey shown in Table 1 and reported in Faridatul et al., 2018. This module is called "Galah Panjang" or is known as the Long Pole Game in English and consists of two main components. The first component is blockly which is visual programming used in creating programs by manipulating blocks of program graphically. The second component is a low-cost robotics based on arduino. This module also implements the game-based learning method to motivate the students in learning programming by using robots as the runner and tagger in a game field. This is in line with Mohamed Amin (2016) who stated that the learning requirement for the Z generation should contain features such as technology-intensive, global-minded and visual learning. Since Programming is a course which is considered hard for novice students, various methods have therefore been developed to enable students in schools or universities to understand and master programming skills both in theory and syntax (Giraldo et al., 2012). The long pole game in this study implements five key activities based on the Kolb's learning model as a complete circle in learning programming effectively (Figure 1). Students will be engaged in hands-on activities in developing the robots and in using the blockly software to program the robots. Although the code is generated automatically using the blockly software, yet the students can manually modify the programming code. Therefore, they need to understand the syntax and use their existing knowledge to modify the code generated by the blockly software. Thus, novice students will not be afraid to start coding the program. Their learning process will start with them understanding the logic flows represented by blocks of code and followed by code modification. The ultimate part in this learning activity is that a game will be performed between several robots based on the developed code. There are a few circles to be played before a winner is announced in this game because a student will change his or her code in each cycle to obtain new strategies to defeat the opponents. The robot that can defeat all of the opponents will be considered the winner.

Key words:

Programming skills, Visual programming, Robotics, Blockly Software, Game-Based Learning,

Table 1: Specification for STEM Module (Faridatul et al., 2018)

Specification for STEM module
• Easy, Attractive, Interactive & Compact • Hands-on & DIY Concept • Appropriate to the learning syllabus • Module is based on specific courses • Can be applied both inside and outside the classroom • Graphic Informative Module • Robotics, Creative & Innovation module • Cheap & Affordable • Module that makes the learning of mathematics and science easy • Module that includes videos • Module for different levels of students • STEM module based on games

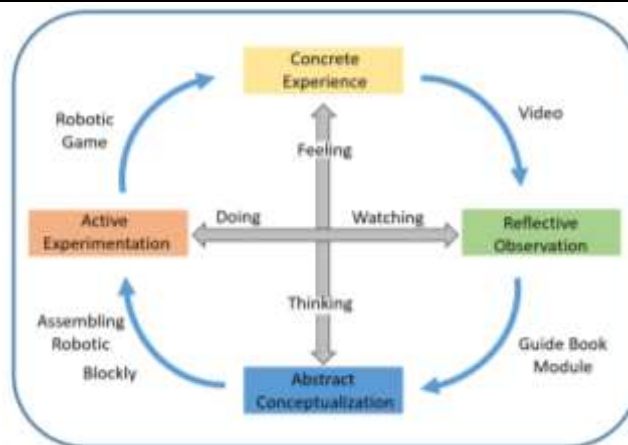


Fig 1: Five key activities in Programming Robotics module - based on the Kolbs learning model

Acknowledgement

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ID NO. UM001	TOPIC: Teaching Cyberbullying using MOOC

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Abstract: Cyberbullying has becoming a serious societal issue all around the world, and Malaysia is included. This project aims to educate teenagers of the age 13 to 19 about cyberbullying through a Massive Open Online Course (MOOC) course. A need analysis was done before the course was fully implemented. The course was modified based on the needs of the target group. Taking advantage of technological advances of Massive Open Online Courses (MOOC) platform, this project is focused on designing and developing a self-learn instructional MOOC on cyberbullying. MOOC was chosen as the main platform of learning due to its unique features: the content of the course can be divided into small blocks of instruction; it can be linked with various multimedia elements such as videos; it supports online interaction between and among the users and instructor; and most importantly, it is freely available online to anyone interested in the topic. Additionally, MOOC is aligned with the new generations of children who are mostly tech-reliant. A post survey was done to explore the level of understanding of the participants after they completed the course. The course was opened to all starting from November 2016 and there were total of 57 participants who joined the course. From the survey findings, results have shown that majority of the students understand cyberbullying better after completion of the course and think that MOOC does help them in learning cyberbullying course. This study provides evidence on how teenagers or participants of the study perceive MOOC in learning cyberbullying issue.

Key words: Cyberbullying, MOOC, social issue, need analysis, effectiveness

Introduction

Rapid changes of technology has given positive impacts on human lives, including communication, education, medicine and many more. Unfortunately, technological communications have also resulted in the rise of cyberbullying especially among children. Cyberbullying, also known as online bullying, is a new form of aggression, harassment or bullying that occurs through the use of electronic communication tools or platforms.

Cyberbullying occurs everywhere all around the world, including Malaysia. A report by Victoria (2017) mentioned that there is an increasing number of Malaysian youths experiencing cyberbullying. Cyberbullying can occur everywhere and anytime to anyone. However, the current statuses of cyberbullying in Malaysia is worrisome due to several reasons:

1. People are not aware of this growing unnoticed serious issue; and that
2. Cyberbullying is missing from our education school syllabus (Ministry of Education Malaysia, 2012), thus it is seldom being discussed with children in schools and at home.

Cyber victims usually choose to tell either no one at all or only close friends about the cyberbullying experiences he or she faced (Slonje & Smith, 2008). At most of the time, adults, such as parents or teachers may not be aware of the issue. Consequently, the cyber victims may never receive sufficient support as their friend might not think that cyberbullying is a serious issue and the adults might not be aware of cyberbullying is happening to the children.

Content

Please address as many of the following sections as possible in your paper, as relevant.

Description of your innovation / product development / design / process.

Taking advantage of technological advances of Massive Open Online Courses (MOOC) platform, this project is focused on designing and developing a self-learn instructional MOOC on cyberbullying. MOOC was chosen as the main platform of learning due to its unique features: the content of the course can be divided into small blocks of instruction; it can be linked with various multimedia elements such as videos; it supports online interaction between and among the users and instructor; and most importantly, it is freely available online to anyone interested in the topic. Additionally, MOOC is aligned with the new generations of children who are mostly tech-reliant.

The main target audience of this project is secondary school students aged 13 to 19 years old because this age group of children naturally communicate and engage with the world via technological devices and Internet. Their wide exposure to and heavy reliance on technologies made them a very high-risk group for cyberbullying.

The MOOC course named 'Cyberbullying - Every YOUTH matters' was designed and developed following the ADDIE instructional design model involving 5 phases: analysis, design, development, implementation and evaluation. This course covers five important areas of cyberbullying which are:

- types of cyberbullying,
- signs of cyberbullying,
- actions can be taken as a victim,
- places for cyber victims to seek help, and
- what to do to help other victims of cyberbullying.

What is the context or background of the innovation / product development / design / process?

Cyberbullying is often addressed after the damage had been done. Although victims can seek for help, the nightmare that they have experienced can never be erased. It is therefore important not only to focus on how we can help them, but also to educate young people to stay away from this problem, not just as victims but also perpetrators. The young people need to be educated and knows where to seek for help when cyberbullying occurred.

Why are they important to education?

Educating cyberbullying to the school children is important because they are exposed to the technology and internet, and they can access to any website they want, contacting with people all around the world. They need to know what cyberbullying is about, how to protect themselves from or handle cyberbullying, and prevent themselves to become one of the cyberbullies.

Please write any advantages of your innovation / product development / design / process towards education and community.

We believe that this course would advantage educators and students to think and aware of cyberbullying issue happen around us. As quoted from one of the participants: "This course on cyberbullying gave me the opportunities to use best practices with my students and to think about the importance of respect, relationships, human rights and democratic principles of life."



Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

Participants who have completed all the activities throughout the course will receive an online certificate of completion generated by the MOOC platform. This certificate will be issued by University of Malaya and could become a valuable learning product for them that shows that their learning efforts are acknowledged by one of the top 100 universities in the world.

Acknowledgement

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ID NO. UM 002
TOPIC: Transforming Co-Curricular Festival Activities with Augmented Reality (AR) Technology Mobile Application
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Abstract: With the emerging of industrial revolution 4.0 (IR 4.0), and its disruptive technology, concepts which comprises Augmented Reality (AR) is being utilized in many fields, including education. AR is not new, however, AR application in education is just beginning to be explored. It is aligned with constructivist concepts and situated learning. This innovation highlights AR used to be embedded in a mobile application to manage co-curricular event, called Co-Curricular Festival in higher education. The AR-mobile application allows students to gain advanced access to useful information of the event, flexibility of managing events irrespective of location and time. With the assistance of mobile device and application, event information is always with the user due to easy access to the information via a mobile device. Whilst compare to a conventional material and method to obtain necessary information, for example using a printing material on paper, has limited space and scarce of visual understanding regarding to the co-curricular events. Hence, this AR-mobile application provides the benefit in managing students' co-curricular events and tasks, including schedule, venues, times, dates and descriptions. At the same time, students are being engaged to conduct co-curricular activities via AR technology. AR technology enables students to view the virtual elements of actual physical environments and engaged them in conducting their tasks and activities.

Key words: *Augmented Reality (AR), Co-Curricular, Mobile Application*

Content

Description of your innovation / product development / design / process.

Augmented Reality (AR) is aligned with constructivist concepts and situated learning. AR enables students to direct their course of discovery in a virtual environment that allow experimentation. Students are engaged in a dynamic process that provides visual and interactive forms of authentic learning. With the emerging of industrial revolution 4.0 (IR 4.0) and its disruptive technology, concepts which comprises AR is being utilized in many fields, including education. Co-curricular courses that offered in higher education institutions are compulsory for all university-level students. Co-curricular festival and community engagement services are two main activities that offered by all co-curricular courses. With the rise of mobile and AR technology in this new era, we suggest the potential utilize of AR digital technologies via mobile application for engaging and managing co-curricular festival activities in higher education institution. This mobile application may have resulted in large communities of participants in co-curricular activities. Such application can provide great potential for self-guided information to manage the festival tasks, activities, guide students to specific location and getting them to look for programs or activities for the festival, which mostly provided in conventional paper format. With the application, students are able to manage their co-curricular tasks, activities easily, communicate with others easily and ubiquitously. Furthermore, AR technology enables students to view the virtual elements of actual physical environments and engaged them in conducting their tasks and activities.

AR technology capable to create a mix reality in real time, enhance the perceptions human gain via their senses in the real world. Equipped with camera, mobile application and internet, mobile devices make it possible to superimpose virtual graphics and media over a physical object, such as poster, object or image.

Students are explored to enhance virtual layers that placed on the real object by viewing the object via a mobile device camera. Augmented media (video, audio, 3D, animation, and simulation) are sent to mobile device from an online database. AR environment also provides multiple level of immersion and interaction, which can immerse and engage students in co-curricular activities. If compared to slide-based presentation or traditional billboard exhibition, AR provide more attention and satisfaction as well as increase students motivation in conducting their co-curricular tasks and activities. Through this application, students just need to scan the co-curricular poster and the mix virtual elements will be appeared in front of them. For example, students can see people cycling in a mix reality environment after they scan the poster. Furthermore, the mobile application enables students to manage their tasks easily. These are including program schedule, location, venue, date, time and type of activities. Students can participate the activities easily and efficiently via this mobile application since they can manage to attend, complete their tasks on time from the real-time information that given via the application.

What is the context or background of the innovation / product development / design / process?

As mentioned previously, the increasing usage of mobile application and emerging of Internet of Things (IoT) due to IR 4.0, all courses are integrated with the special features or innovation technology to engage students learning and enhance their soft skills via the co-curricular activities. The use of AR-mobile application as learning tool is still not widespread among students although the heavy usage of mobile devices in students' live. Hence, this innovation is suggested in co-curricular course events or activities due to it's potential to engage and immerse students in co-curricular activities, This AR digital technology can transform a "static" co-curricular activities or events setting to a "live" virtual environment. For example, the poster or related object, banner triggering images or videos of the co-curricular events, portraits bringing to live interview, wall displaying the real geographical locations.

Why are they important to education?

AR, a simple virtual technology which is easy to bring into the classroom and it allows the seamless integration between the real world and the virtual world. AR is a technology that augments a real-time image of the real world with 2D or 3D computer generated objects, and allowing users to interact with them (Siti, Mohd Fairuz, Wong & Oskam, 2015). AR can expand students' learning experience from the use of 2D materials by utilizing 3D special learning when applied to things like graphs, maps, and diagrams. The concept of "sense of presence" when using AR in learning activity context, enable students have an actual experience and remember it as an actual event and hence to connect with their previous skills or knowledge. Collaborative learning may be created when all students explore to the AR technology that apply in the mobile application. This will make co-curricular activities more exciting and engaging, as well as enhancing their soft skills indirectly with their special discoveries and real experiences, such as information management, teamwork and flexibility. Besides that, AR also increases students' problem solving, critical thinking and collaborations, students may have gained a more authentic learning experience, increase motivations, face-to-face and remote collaboration, increase students' performance and learning attitude (Scrivner, Madewell & Buckley, 2016).

Please write any advantages of your innovation / product development / design / process towards education and community.

This innovation helps to foster discovery-based learning among students. In discovery learning, AR ability enhance the learning via the lived experience in front of the participants. For example, this mobile application is used to gain extra information if the form of diagrams, audio, video and maps when they attend or visit the co-curricular festival venue. This innovation also highlights the experiential learning theory which define learning as the process whereby knowledge is developed via the transformation experience and leading to the development of their own soft skills after they participate the festival by bringing along the mobile application. Figure 1 has illustrated some snapshots of the mobile application that provide useful information for the Co-Curricular Festival.



Figure 1: Some snapshots of the mobile application.

Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

The setup involved in this learning design, either hardware or software, are low-cost and open source which does not limit the usability in creating AR. AR in education was just starting in our country, and it's features to immerse and engage users can be used to manage and conduct co-curricular events for co-curricular course now via mobile application. While profitability might not exist, it can still be said that this learning design can be easily accessible and adopted by anyone in managing and conducting co-curricular events for co-curricular course in higher education institutions. The AR digital technology are created using an open source application and non-proprietary programming language and this ensures availability and indirectly the sustainability of this learning design adoption.

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ID NO. UM 003
TOPIC: STEM Learning via Self-Made Micro-Controller-Based Environment Monitoring System of Micro Green Plantation
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Abstract: Recent emphasis on industrial revolution 4.0 has made learning in Science, Technology, Engineering and Mathematics (STEM) ever important in the context of secondary and even tertiary education, however the decline in the number of science-stream students in secondary schools in the recent years is a huge concern. Conventionally, STEM learning is tied with high-technological fields such as computing, in contrary to other sciences such as agriculture. This learning design intends to instill the interest of students in STEM through indoor agriculture activity, namely micro green plantation, with the incorporation of an environment monitoring system. This self-made programmable environment monitoring system is made up of a number of different environmental sensors, such as temperature sensor, humidity sensor, ambient light sensor, etc., that are managed by a central and programmable micro-controller board. This allows various plant environmental factors to be monitored, such as the air temperature, moisture level, and light level. Through this learning design, bridging between the agriculture field and the technological field, namely the computing field, will also be accomplished through the incorporation of a self-made, micro-controller-based environment monitoring system. With multiple approaches towards STEM learning, this innovative learning design is expected to be capable of increasing secondary students' interest in STEM when implemented. The harvested micro greens from the planting activity does have commercial value as they can be sold in exchange for profits which can then be used in maintaining the sustainability of this STEM learning activity.

Key words: *STEM, Micro green, Environment monitoring, Plantation*

Content

Description of your innovation / product development / design / process.

The introduction of industrial revolution 4.0 and education 4.0 has caused a great emphasis on learning in Science, Technology, Engineering and Mathematics (STEM). However, the decline in the science-stream students in secondary schools has become a challenge. This learning design intends to overcome the decline in interest through an indoor agriculture activity, known as micro green plantation, together with the incorporation of technology, including a self-made programmable environment monitoring system and other multimedia technologies for the monitoring of plant growth. Micro green is defined as the initial stage of edible greens that germinate in soil or a soil substitute from the seeds of vegetables and herbs. Micro greens generally contains more nutrients compared to the matured greens (Xiao et al., 2012). They are smaller than baby green or baby leaf stage, but are harvested later than sprout stage (USDA, 2014), usually in a time-frame of 7 – 10 days. This makes micro green a suitable plantation for school-based agricultural activity with the objective of STEM learning. In addition, through this learning design, bridging between the agriculture field and the technological field, namely the computing field, will also be accomplished through the incorporation of a self-made, micro-controller-based environment monitoring system. By a combination of agricultural and technological sciences, this learning design will instill students' interest in science through multiple approaches.

As described in the introduction, the learning design comprises of two parts, namely the micro green plantation and the self-made environment monitoring system. For micro green plantation, the setup is related to indoor planting activity, namely racks and containers, water source and light source. Various types of available micro green seeds will be used, for example broccoli, beet, kale, etc. As the planting process is relatively short (7 – 10 days), the entire plant growth will be recorded and subsequently made accessible through multimedia technologies to demonstrate actual plant growth scenario. Meanwhile, the incorporation of the environment monitoring system complements the main activity by bridging between agriculture science and technological science. Basically, this self-made environment monitoring system is made up of a number of different environmental sensors, such as temperature sensor, humidity sensor, ambient light sensor, etc., that are managed by a central and programmable micro-controller board. This allows various plant environmental factors to be monitored, such as the air temperature, moisture level, light level, etc. Together, these two parts of the presented learning design will enable the students to learn both agricultural science and technological science to achieve the objective of increasing interest in STEM.

What is the context or background of the innovation / product development / design / process?

This learning design stems from the concern over the decline of interest in STEM fields as indicated by a reduction in the number of science-stream students in secondary schools over the past few years. Following this, measures have to be taken to instill back the interest of students in science. However, conventionally these measures are mostly tied with technological fields such as computing only, while the less popular and less technological-related sciences like agricultural science are left behind. With this innovative learning design which encompasses planting activity and digital-based environment monitoring system, it is shown that the objective of STEM learning can also be accomplished for even non-technological fields.

Why are they important to education?

As mentioned above, this learning design is important to education as it can increase students' interest in STEM, or in general science-related fields. Specifically, through micro green plantation and the subsequent video recordings, students will have greater understanding on the growth stages of plants. Meanwhile, with the monitoring of various environmental factors, students' interest in agricultural science will be instilled through questions such as 'what are the different factors that influence plant growth, and how are the influences', as well as 'how these factors are measured digitally in real-time'. All these converge to the goal of instilling interest of students in science, which is important for education following the stepping in of industrial revolution 4.0.

Please write any advantages of your innovation / product development / design / process towards education and community.

Generally, STEM learning in Malaysia is facing a range of challenges from enrolment to performance, the enrolment in the science stream at secondary school level is under expected ratio which stated 60:40 (EPU, 2005). Interest among students in STEM learning are scarce, hence, there is a need to increase the technologies in supporting teaching and learning process for STEM learning as well now is at the age of industrial revolution 4.0. Micro green plantation plus digital-based environment monitoring system is the innovation that can bring a lot of contributions as shown as below:

- Developing a learning community when all students and teachers are engaging to this activity and learn together
- Physical learning environment enables students actively participated to this learning activity and enhance their STEM learning
- Designing technology for efficient and effective teaching in schools by using self-made digital based monitoring system in Micro Green plantation
- Fostering innovative thinking among students by using this innovation designed activity
- The useful sensor system that used in Micro Green plantation enables students familiar with instruments, components, manuals, circuit wiring and other related work. This can improve practice considerably.
- This learning design envision how IoT capabilities can be used in STEM programs



Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

The harvested micro greens from the planting activity does have commercial value as they can be sold in exchange for profits which can then be used in maintaining the sustainability of this STEM learning activity. As a side benefit, students' involvement in marketing the harvested micro greens will also instill entrepreneurship mindset as well as social responsibility among them. Meanwhile, this learning design, including the microgreen plantation and the self-made environment monitoring system, are cost-friendly and can be easily adopted by any interested school.

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ID NO. UMK 001	TOPIC: Interactive Learning in Club Management Course (ILeCC)

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Abstract: Interactive Learning in Club Management Course (ILeCC) developed to provide enhanced ability to apply the new knowledge or processes, develop great enthusiasm, and encourage active and fun learning among student. ILT's also may enhance the long-term retention of information and reduce learning time by offer more effective learning tools through the combination of Padlet, Socrative, Kahoot, Blendspace, Facebook and YouTube. In order to retain student attention and facilitate learning, integrating a variety of activities using the ILT's may change the pace, interaction, and variety that help to enliven the classroom atmosphere and encourage deeper learning for student especially in Club Management Course.

Key words: *Interactive Learning Tools, student engagement, teaching and learning and E-Learning*

Introduction

Interactive learning in Club Management Course (ILeCC) is the collaborative learning application (e.g. edmono, quizziz, edpuzzle) on student learning and engagement in undergraduate Club Management courses designed for blended learning. This learning application is to supply better capability to apply the new knowledge or processes, increase the student's engagement and enhance the learning tools through the combination of online blended learning and flipped classroom. Moreover, this learning application will assess the student's journey throughout their experience during Club Management courses. In Club Management courses, student's are required to create their own video, practice on online tutorial, establishment of attractive storyboards and 3D model, online quiz and do a presentation on selected chapter in front of the classroom. Lecturers will identify videos and assessment uploaded as evidence of the activities that can be observed. This learning application is aimed to assist both students and lectures from the basic application to the submission of final report. The conventional method that had been used before on traditional method of teaching is less interactive. Moreover, this learning application will allow the lecturers to update any latest instruction and it can be delivered to the students in the nick of time. Students are able to interact and ask the lecturers through online regarding any topic related with the club management syllabus. The constructive regarding the approach is combination of incredible tools including socrative, quizziz, edmono, quizlet, coogles and others. Thus, the usage of varieties of application will increase the creativity of the student's assessment.

E-learning has been defined as a combination of learner, faculty, instructor, technical staff, administrative, learner support, and use of the Internet and other technologies (Volery & Lord, 2000). In parallel, the success of an E-Learning system may be considered as an emerging concept of 'social issues' and 'technical issues' and



depends on numerous circumstances, rather than a black-and-white formula. E-Learning systems are open systems so they are affected by the environment and influenced by the people who use them.

The implementation of E- Learning tools is a better approach in moving forward plus provides many benefits to the students. It is not only deliver information in fast pace but also create more creative, active and progressive students. The students can thinks outside the box and sharing the information that they get with others with more productive manners. The assessment of the students throughout the subject also can be more eco-friendly manners by uploading using some apps.

The development of ILeCC comes from the inspiration of E-Learning concept that been used nowadays. This learning approach is cost-effective and straightforward as the student's that apply this application do not need to worry about filling in hard-copy forms. Other than using blended learning club management courses uses flipped classroom which offers a great use of technology. The flipped classroom that be used in classroom will increase its validity for educators.

Content

Club Management course is a subject that been taught specially for hospitality student at Universiti Malaysia Kelantan, Faculty of Hospitality, Tourism and Wellness. This course aims to give the overview to the students pertaining to the scenario and the concept of a club management and its importance in supporting the hospitality industry. This course describes the strategic planning process, club marketing, human resource aspect as well as training and professional development in clubs. It also highlights the strategies of membership retention, and managing recreational activities in a club setting. Other topics to be covered include the quality service in club and managing entertainment in club industry.

The objective of the course is (1) to describe the strategies of membership retention, membership recruitment and membership marketing in club operation, (2) to study the leadership role of management professional in the club operation and (3) to discuss small business management techniques in the operation of a private club management. Club Management courses have to fulfil 100% for assessment that 60 % for ongoing assessment and 40% final examination. For ongoing assessment this courses divided into few group and individual assignment namely video presentation, developing storyboard, quizzes and forum discussion. The traditional method of teaching for club management is the lectures spread and convey the information thru lecture to the students.

Selim (20017) explained that electronic media such as internet and videos are medium that can be used to share content through e-learning. E-Learning has become the latest trend that challenges the traditional concept of education. E-learning can provide education and training with the use of various electronic media or communication technologies to anyone, anytime and anywhere all over the globe (SUmak, HeričKo & PušNik, 2011)



Figure 1. The Learning Pyramid. Adapted from National Training Laboratories, Maine.

The first four (lecture, reading, audio-visual, and demonstration) are passive teaching methods. In contrast, in the bottom three (group discussion, practice and teach others) are participatory or active teaching methods. Arguably, the difference in retention between passive and participatory (active) methods is due to the extent of reflection and deep cognitive processing (Su and Gu, 2018). Moreover, in assessing student engagement flipping the classroom also be used. As its name suggest, "flipping" describe the inversion of expectations in the traditional college lecture. It takes many forms, including interactive engagement, just-in-time teaching, and peer instruction (Lu, Huang, Huang, Lin, Ogata, and Yang, 2018). But the techniques all share the same underlying imperatives: student cannot passively receive material in class, which is one reason some reason some students dislike flipping. Instead they gather the information largely outside of class, by reading, watching recorded lectures, or listening podcasts. And when they are in class, students do what is typically thought to be homework, solving problems with their teacher or peers, and applying what they learn to new contexts. They continue this process on their own outside class. The immediacy of teaching in this way enables students' misconceptions to be corrected well before they emerge on a midterm or final exam. The result, according to a growing body of research, is more learning

Benefits of Blended Learning

Undeniably, students and institutions will benefits from blended learning. Blended learning provides students and institutions effective use of resources, improved learning outcome, provides sense of community, access flexibility and definitely satisfaction and boundless learning environment and experience. Lim and Morris (2009) contended that courses that implement blended learning as a teaching and learning tools or demonstrated to enhanced learning outcomes of student. Institution that redesign blended learning as their medium for teaching and learning has shown that students able to achieving higher grade, improved knowledge, and understanding of courses concepts.

Additionally, blended learning can enables the control and review of learning and learning (Osguthorpe & Graham, 2003), and enhanced flexibility of access to teaching and learning that supports the student's autonomy, reflection, and controls of research (Sharpe et al., 2006). The nature of blended learning modules have combination of online and face-to-face that develops students' capability to control their own pace of learning such as students are able to catch up on a course if and when they can (Smyth, Houghton, Cooney, & Casey, 2012). Blended learning has contribute to the institutions the opportunity to embrace technology,

explored transformative potential, support active and meaningful learning and encourage a community of inquiry (Garrison and Vaughan, 2008).

Garrison and Vaughan, (2008), enlighten that the advantage of blended learning is also for cost and resource effectiveness for instance costs for institutions are saved as developed materials can be placed online and re-used for an extended period of time. Not only cost efficient teaching and learning through blended learning also can reduce the staff and student classroom contact time and consequently save on staffing costs. Blended learning also encourages student satisfaction; it enables the students to become more motivated and more involved in the learning process, thereby enhancing their commitment and perseverance (Donnelly, 2010). Staff and students have both reported that the online components of blended learning encourage the development of critical thinking skills. Student satisfaction has also been reported to be higher in blended learning courses compared with purely face-to-face courses (Dziuban et al., 2006). Table 1 display a summary of the benefits and challenges associated with blended learning.

Table 1. Summary of the benefits and challenges of blended learning

Benefits
• Enhanced student learning outcomes • Greater flexibility for students and teachers • Improved autonomy, reflection, and research skills • Reduced student withdrawal rate • Ability to foster a professional learning environment • Potential cost and resource savings

As above table, the main benefit of using blended learning is course flexibility. This flexibility accommodates students with varied learning styles, non-traditional course access requirements, and non-traditional course pacing preferences. This is particularly important, where students do not attend classes regularly, and where lecturers need to use the contact time to create interactive activities rather than using valuable time passing on general information. Blended learning is particularly suitable for subjects that require hands-on experience, such as teacher training, construction technology, and property development.

Commercial value of ILeCC

By looking at today's trends in teaching and learning of Z and Alpha generations, both are very highly engaged with latest gadgets and technologies in their daily life. Moreover, most today's industries are also moving towards Industrial Revolution 4.0 or IR 4.0 to cater with the industrial needs. Therefore, teaching and learning must innovate and align with the IR 4.0 to produce graduates who are rich with the soft skills needed by the industry. Hence, education in the 21st century is all about embracing digital technology.

This year, Faculty of Hospitality, Tourism and Wellness (FHPK), Universiti Malaysia Kelantan (UMK), has changed the teaching delivery from traditional to blended learning by practicing flipped classroom method in all courses. For the Club Management course, the method as presented in Figure 1 has been implemented using Interactive Learning Tools (ILTs) such as Blendspace and flipped classroom where students are engaged with activities in the class.

Using the ILTs in classroom has enlivened the classroom atmosphere and encouraging deeper learning of the students. Furthermore, it is the first module implemented in FHPK and UMK for Club Management course and can be implemented in other courses in all institutions nationally and internationally. Has a long-term commercialization prospect in teaching and learning to develop Blended Learning course in future for hospitality program.

Table 1: Student Survey

Items	Blended Learning (N=92)	Traditional Method (N=92)
Overall, this was an excellent course. Overall, the instructor was an excellent teacher	100% (92)	-
I gained a good understanding of concepts/principles in this field.	87% (80)	13% (12)
The clarity of instruction was good	94% (85)	6% (7)
I will use what I learned in Club Management in my career.	54% (50)	46% (42)
I deepened my interest in the subject matter of this course	82% (75)	18% (17)
I was motivated to do well in Club Management	98% (90)	2% (2)
I enjoyed the class because the Club Management class was interesting	100% (92)	-
I am confident in my ability to understand and apply concepts learned in this course.	97% (89)	3% (3)
I find online class delivery of accounting materials at least as effective as traditional in-class delivery.	95% (87)	5% (5)
I find online class delivery is more effective than traditional in-class delivery	100% (92)	-

An analysis has been done on 92 students that currently taken Club Management Courses on Academic Session Feb 2017/2018. . There are ten (10) questions being asked in a survey as to get their opinion on the effectiveness of the new methods of evaluation on the club management courses. We can see from the result that about 100% from the respondents are generally strongly agree with the simplification of the teaching and learning method especially when it involve the usage of application such as YouTube, Blendspace, Padlet and Facebook as the medium.

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ID NO. UMK 002	TOPIC: Al-Munawwar: A Basic Arabic for Communication

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Abstract: This project presents an online course known as MOOC Al – Munawwar through the platform openlearning.com based on the ADDIE instructional design model. The online course was designed based on students' needs, opinions, and suggestions, which will be evaluated by the participants involved in this study, selected among students who are studying the Arabic language Communication level 1. Arabic online Course (Level 1) contains six (6) main chapters divided into 14 lessons for this MOOC offer. Each lesson focuses on the application of four language skills ie; written skills, listening skills, reading skills and basic speaking skills for beginners. The lessons presented are very simple, easy and suitable for beginner students who have no basic grammar in Arabic. Hence, the main focus of the course is the introduction of the Arabic language itself as well as the basics of Arabic that are easy to understand by beginner students.

Key words: Arabic Language, Open Learning, Massive Open Online Courses (MOOC), Language Learning, e-Learning.

Introduction

Massive Open Online Courses (MOOC) is one of the most prominent instructional delivery tools for education. The emergence of new information and communication technologies has paved the way for educators to create a groundbreaking online learning environment that enhances the entire teaching and learning process (Jen Her Wu, Robert D. Tennyson, Tzyh Lih Hsia, 2010). MOOCs contain online courses that can be accessed through the web and offer unlimited entries. According to G. James Mozoue (2014), it presents a model for delivering online learning content to anyone who wants to attend a course, with no restriction on attendance. MOOC combines both traditional and modern course materials for learning such as videos, reading, projects, assignments and more.

Additionally, students can participate in interactive user forums provided by MOOCs and this interactive forum helps build communities for students, lecturers, professors, teachers and all users. MOOC is still very new development which has just begin to evolve in 2012. Some early MOOCs emphasize open features and open licensing of content, structure and learning goals the features are to promote the reuse and diversity of resources. However, some of the newer MOOCs use closed licenses for their course material but still maintain free access to users from around the world.

Another interesting point about MOOCs is that it does not require formal qualification and no entry requirements. However, courses offered are recognized internationally as most of these courses are offered by universities and notable institutions from around the world such as Harvard, Yale and Stanford and other leading universities in the US, UK, Europe and Asia and all materials are provided by the universities and institutions. Lastly, the courses offered by MOOCs are mostly accessible through computers, mobile phones, tablets and other devices which will make the learning process more fun as students can learn anytime and anywhere as it does not require them to be in a specific place to learn.

Universiti Malaysia Kelantan (UMK) is one of the public universities in Malaysia that is involved in MOOC development as recommended by the Ministry of Higher Education. The development of MOOC is one of the initiatives to support the policy of Redesigning Malaysian Higher Education in 2017. The MOOCs Development



in UMK has been increasingly being welcomed by lecturers and faculties at the beginning of 2017 with an increased number of MOOC courses offered. All MOOCs are now available at <https://www.openlearning.com/umk> and could be accessed by everyone.

The Development of e-learning in Teaching and learning of the Arabic Language

The online learning system has been used since several years ago and has become a common medium for conducting teaching and learning process in universities. In this regard, the emergence of new technologies in the education system has surpassed beyond web-based learning as Learning Management system, Online learning, Augmented Reality are gradually replacing the conventional teaching approach. The use of technology is becoming one of the most important tools for the delivery content of teaching and learning is growing rapidly worldwide. E-learning makes the learning process much easier and flexible, and at the same time, it is more feasible for universities to cater for all groups of students.

Meanwhile, Language is a medium between mind and learning as ineffective language distorts ideas (Orwell's, 2007). Hence, learning a foreign language like Arabic requires a strategy that can boost the teaching and learning process. The processes in teaching and learning Arabic need to be more integrated and more interactive and e-learning is an effective strategy that can be employed to learn languages.

Over the last few years, the advent of the internet with higher capabilities has impacted the education field, especially in language learning. The rapid growth of technology drives innovation in online learning. Some of the devices used in online learning are servers, laptops, tablet, computers, smartphones, PDAs, MP3/MP4 players, handheld gaming devices, mini notebooks or netbooks and others (Hashemi M., 2011). The effectiveness of using multimedia and web-based learning in learning Arabic has been proven by Mohammad Taufiq & Wan Ab Aziz (2016) which found that web-based learning has a significant contribution in motivating students to learn Arabic by acquiring vocabulary, improving language skills and gaining information, especially in a foreign environment. The effectiveness of website can be measured in terms of its ability to elaborate upon language skills taught in a classroom. Besides that, there are several studies have been conducted in developing technologies toward teaching and learning Arabic in Malaysia as well. Another example of web-based learning is the Learning Management System (LMS) that uses the Moodle platform medium to develop tools for online learning process and that provide instructors with a way to create and deliver content, to monitor student participation and engagement, and to assess student performance online (Lonchner, B., Conrad, R. & Graham, E, 2015). On the other hand, despite the development of e-learning, there are some grievances that need to be addressed, especially in the development of learning platforms for Arabic language learners. In recent years, there is an increasing amount of literature and studies on using of multimedia elements in teaching and learning Arabic, like what discussed in the works of Mohammad Sabri Sahrir et. al (2012), Sharifah (2013), Nurkhamimi (2014), Amani Nawi (2014) and Karkar (2015).

In the meantime, many institutions of higher education in Malaysia have adopted LMS as a platform for learning and teaching. A study done by Wan Ab Aziz & Mohammad Taufiq Abdul Ghani (2017) explored the acceptance of Schoology as an online Learning Management System based on Technology Acceptance Model (TAM). Overall findings of the study show positive feedback among students to learn via learning management system as it contributes many positive impacts and advantages among students such as improve academic productivity and achievement, accomplish at task quickly, and accessible even outside classroom wall.

Massive Open Online Courses (MOOCs) have been one of the most trend technology used by the educator nowadays. A MOOC is different from other web-based learning system as the online course provided is more accessible to a large number of students, up to thousands of students per course (Siemens, 2013). Due to the high number of students, the learning process of a MOOC differs from web-based learning or LMS as students enrolled in MOOC are more independent. Furthermore, the MOOCs are not only open to university students, but also the members of the public regardless of their qualifications.

Research objectives

The main objective of this study is to develop Massive Open Online Courses for Arabic Language targeted for UMK students using ADDIE instructional design model. This endeavor entails executing the objectives in stages as stated below:

Table 1: ADDIE Instructional Design Model

Stages	Sample Task	Sample Output
Analysis: The process of defining what is to be learned.	- o Need assessment - o Problem identification - o Task analysis	- o Learner profile - o Description of constraints - o Needs, Problem statement - o Task analysis
Design: The process of specifying how it is to be learned.	- o Write objectives - o Develop test items - o Plan instruction - o Identify resources	- o Measurable objective - o Instructional strategy - o Prototype specification
Development: The process of authoring and producing the materials.	o Work with producers	- o Storyboard - o Script - o Exercises
Implementation: The process of installing the project in the real world context.	- o Teacher training - o Tryout	o Students comments, data
Evaluation: The process of determining the adequacy of the instruction.	- o Record time data - o Interpret test result - o Survey - o Revise activities	- o Recommendation - o Project report - o Revised prototype

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ID NO. UMK 004
TOPIC: Social Entrepreneurship on WEB2.0 Tools: A Platform for MOOC at Universiti Malaysia Kelantan
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Abstract: The entrepreneurial education revolution that captured our imagination during the last decade has now permeated every aspect of business and social thinking and planning. The process of transforming creative ideas continues to use the concepts of Web 2.0 tools in teaching and learning of social entrepreneurship course. The immersive learning requires a methodology of a cohesive process of creativity, risk taking and planning. Some 179 students participated with 1,056 comments captured. Participations merely from students in Malaysia and the United Kingdom. The course introduces students to another domain of entrepreneurship i.e. social entrepreneurship. This particular entrepreneurship domain has received increased attention since social organizations have been looking for new source of fund to sustain their activities as public grants and donations have become very difficult to obtain. Students will have the opportunity to learn the role of social entrepreneurs in managing social organization. Several familiar concepts in entrepreneurship allow the teaching & learning process on OpenLearning.com to interact and collaborate with learners such as the use of social networking sites; Facebook, video sharing sites (YouTube) and animation software (Powtoon, Biteable, Coogler and Renderforest).

Key words: social entrepreneurship, Web 2.0 tools, Education 4.0, OpenLearning.com.

Background

This paper aimed to present the potential benefits, enabling conditions and policy aspiration of individuals in teaching and learning Social Entrepreneurship course online. It becomes important to look into the emerging trend of social entrepreneurship values to socio and economic impacts; along with the view and experiences of relevant stakeholders such as the policy and regulatory framework on the part of the government; the socio-values driven by the business organisations and institutions and the vulnerable groups and women. Questions on either social entrepreneurship is a viable business model for inclusive society and can lead economic empowerment remain debatable, Harman (2016). It is imperative that these nature of understandings is framed into the context of teaching and learning at university level. Various angle of discussion and intellectual discourse can be learned, shared and documented. In particular, the nature of emergent concept, background and impact of social entrepreneurship had on the local, regional and world economy was described. Is there a common practice on the role of government and other stakeholders in priming a favourable business environment for selected target group such as the poor, women, vulnerable communities, etc., in social entrepreneurship?

The concept of social entrepreneurship

This course is designed in response to the rapid growth and improved awareness of the need to understand on social entrepreneurship, Asian Social Enterprise Incubator, Inc. (2013). For example, according to APEC Investments Experts' Group (2015), improved standards of living in developing economies have created a strong demand for goods and services by low income communities, which is valued at US\$5 trillion a year. There appears to strong support among big organisations to include low income communities as consumers, Asian Development Bank (2016). In this nature of issue, businesses divert their product offerings and strategies of the markets in their value chain to connect the poor communities and contribute to address poverty alleviation, Zainudin, Raja Suzana & Zulazli (2017).

Objectives

Strategies, best practices and framework for excellence in teaching and learning (T & L) of social entrepreneurship course are set to achieve:

- 1- Modules are designed to assist learners to build skills in managing social organisation;
- 2- Practice creative technique exploiting ideas to create social enterprise;
- 3- Understand the use of Web2.0 tools in delivering T&L processes; and
- 4- Demonstrate how social entrepreneurs mobilize resources, take risks and be independent.

Novelty

1. The online team-based course to work on the social impact projects; and
2. Four reading guides, three workshops and seven videos featuring how social entrepreneurs make their entities more self-dependent.

Importance to education

A. Product creativity and innovation

1. Building a module with local case studies;
2. Incorporate immersive learning that engage learners with the real social entrepreneurial values; and
3. The use of Web 2.0 tool in the teaching and learning.

B. Immersive Learning

1. Incorporate immersive learning that engage learners with the real social entrepreneurial values; and
2. Immersive learning between coach & learners where group collaboration tools and creative skills are heavily utilised

C. Usefulness

1. The content elements and information architecture to build the connectivity between social enterprise case and learners interest; and
2. Learners can seek, collect, organise, process and use the relevant information to make decision in managing the risk of social entrepreneurship.

The development of the course is completed and the first cohort of the class had participated during Semester February 2018. Some 179 students participated with 1,056 comments captured. Participations merely from students in Malaysia and the United Kingdom. The course introduces students to another domain of entrepreneurship i.e. social entrepreneurship. This particular entrepreneurship domain has received increased attention since social organizations have been looking for new source of fund to sustain their activities as public grants and donations have become very difficult to obtain (Raja Suzana, Zulazli, & Ahmad, 2018). Students will have the opportunity to learn the role of social entrepreneurs in managing social organization (Raja Suzana, 2018). Several familiar concepts in entrepreneurship allow the teaching & learning process on OpenLearning.com to interact and collaborate with learners such as the use of social networking sites; Facebook, video sharing sites (YouTube) and animation software (Powtoon, Biteable, Coogler and Renderforest).

Recognitions

The following recognitions were awarded:

1. Gold medal: ITEX 2018 – Mobile apps for the startup OKU and donation-based crowdfunding platform, KLCC, Kuala Lumpur
2. Bronze award (2018): MOOC competition at 1st International Media Literacy Conference 2018, Kuala Lumpur.

3. Bronze award (2017): MOOC course on social entrepreneurship, Minggu Penyelidikan & Inovasi, UMK Kampus Jeli.
4. Gold Award: KNOVASI UKM 2017 (Teaching and Learning Youth Methodology Category) Social Innovation: Bridging Society Into The Classroom And Creating Heropreneurship In Teaching And Learning (Unpublished research report). Universiti Malaysia Kelantan, Malaysia.
5. Silver Award: KNOVASI UKM 2017 (Teaching aid and e-Learning Methodology Category) Building Opportunities for Inclusive Leadership: Social Innovation Lab. (Unpublished + research report), Universiti Malaysia Kelantan, Malaysia.
6. Bronze Award: KNOVASI UKM 2017 (Evaluation and Assessment Category) Social entrepreneurship evaluating the theory of change. (Unpublished research report), Universiti Malaysia Kelantan, Malaysia
7. Social Entrepreneurship on Web2.0 Tools (2018), Proceeding presented at the Seminar in Entrepreneurship and Commerce, UMK Pengkalan Chepa, 6-7 May, 2018

Commercialisation Potential

The following Table 1 illustrates the commercial value earned in term of the course potential to be offered as a package on capacity building to grow social entrepreneurship.

Table 1: Module on Social Entrepreneurship: the commercial package

Module Title	Copyright No	Normal package A 1-day Crash-course	Advance package	
			A-2-day	A 5-day
Setting up Pastry & Bakery in Social Enterprise	CRLY00007519	RM250	RM350	RM400
Business plan for social enterprise	CRLY00007517	RM350	RM450	RM500
Money Management	CRLY00007520	RM250	RM400	RM500
Open a Social Enterprise in 4 Week	CRLY00007516	RM250	RM400	RM500

Conclusion

The major benefits that students will experience when implementing and learning the process of becoming social entrepreneur are on the shared value, balancing socio-economy impact and increase value chains to improve the bottom line, while accelerating economic growth of the lower income communities and those from the vulnerable backgrounds. The explicit social objectives appear to be the very important mission that social entrepreneur aimed to achieve, in particular to improve individuals' or communities' socio-economic status. Framing these issues into an interesting Web 2.0 tools and teaching students on how to build and maintain a social licence to operate social enterprise will open a framework of excellence in communicating the objective of the course.

Acknowledgement

The author thanks Universiti Malaysia Kelantan for the support on the MOOC platform and funding assistance to participate in IDEL, IUCEL 2018.

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ID NO. UMK 005	TOPIC: INNOVATION EDUCATION 4.0 ADAPTING MASSIVE OPEN ONLINE COURSE: MOOC IN MOOC TECHNIQUE

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Abstract: The courseware was developed according to the gamification arranged through the framework of the eProjBL model. This model is used as a base for this course. Poster production skill course by using Adobe Photoshop used as evaluation with included three learning outcomes as indicators. This course was designed and become a "Learning Object" for the other courses in the Faculty of Creative Technology and Heritage such as Computers and Art course and Computer Graphics 2D course as a pioneer for the "MOOC in MOOC" technique. The activities in the course were designed by integrating Web 2.0 tools such as Powtoon, Biteable, Goanimate, Coggle, Popplet, Canva, and Google apps. The creativity of learners can be highlighted.

Key words: *E-Project-based Learning, Skill-based Course, Blended Learning, Web 2.0 tools.*

Content

Assessment method / design / process.

Implementing an assessment tool which adapting from E-Project-based Learning (eProjBL) to access the student's capability in four themes such as Character, Teamwork, Artefacts, and Presentation. Each theme was consisting the sub-themes to help the educator to reuse the item of assessments for their course. The assessment is applied in blended learning environments which integrating skill-based courses in a MOOC. Technique "MOOC in MOOC" also applied to integrate between theory-based courses and skill-based courses.

Based on constructive philosophy by Dewey and Vygotsky, student-centered learning approaches in blended learning was introduced. Through eProjBL Model, the course has been developed through KLU strategy (Know-Learn-Use) on each module with the challenges in MOOC. Create the assessment on each module based on gamification approach helps learner to maintain engagement. The student-centered environment which consist of continues assessment, self-assessment and peer assessment can be implemented. Moreover, these assessments could capture their understanding and knowledge by create their own mind mapping, animation and video to present their task.

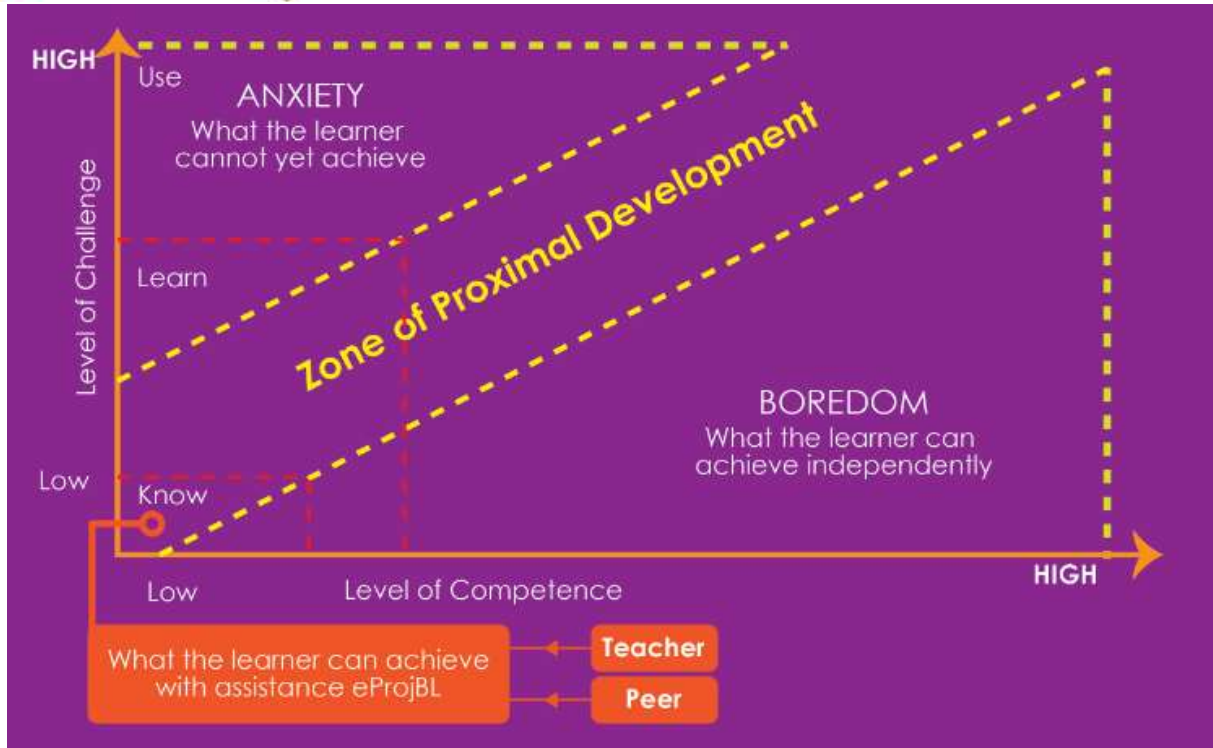


Figure 1: Edutainment Design in eProjBL model

Background of the assessment method / design / process

Gamification are used to increase learner's motivation to complete the tasks given. This method emphasizes instructor systematically design that emphasizes students ' level of knowledge, the concept of persuasion and appreciation (reward).

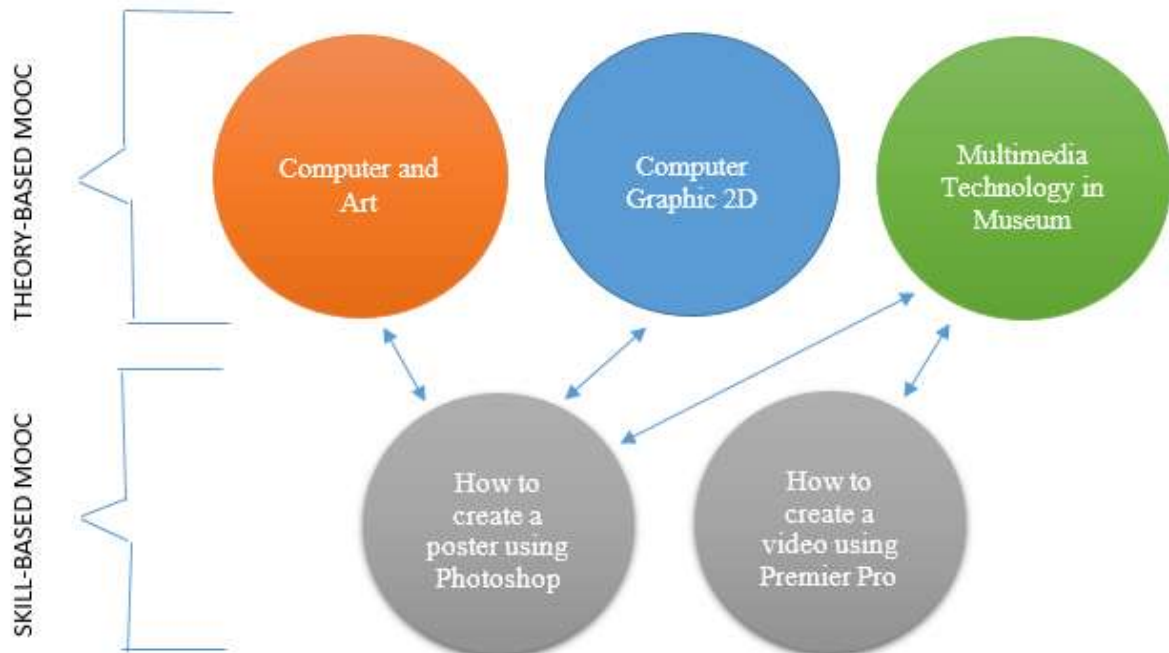


Figure 2: Relationship Learning Object between Theory-based MOOC and Skill-based MOOC

There are eight steps of MOOC in MOOC technique implementation (Figure 4):

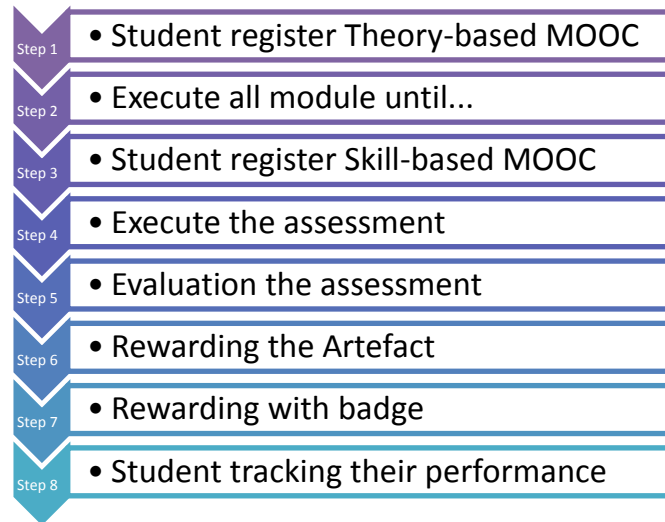


Figure 3: Eight steps of MOOC in MOOC technique implementation

The important to education

It has become an alternative assessment tool in a blended learning environment. The student-centered activities were created inside MOOC courses to maintain the student engagement to continue finishing their activities. The element of gamification or game machines were applied inside the MOOC courses.

Advantages of your assessment method / design / process towards education and community.

The Skill-based MOOC was created to allow large number learners (in and outside of university). It allowed the learner to collaborate with others learner from difference perspective and knowledge to solve a problem when execute the task given.

Suggestion solutions the challenges or issues.

Through conventional methods, the faculty is facing constraints on the needs of trainers (Assistant Lecturer) for tutorials/ labs is limited, the increasing number of students to use tutorials/ labs which affect the schedule for the consultation because of limited in learning space. To solved these issues, creating a blended learning environment that utilized the "MOOC in MOOC: technique which promoted a student-centered learning environment.

Applicable to other academic disciplines.

The approach can be applicable to the any courses that executing blended learning and student-centered learning environment. The type of assessment can be applied are continues assessment, self-assessment and peer assessment.

Acknowledgement (if any)

Alhamdulillah, our heartfelt thanks goes to Ministry of Higher Education; Associate Prof. Dr. Suria Baba and Associate Prof. Ahamad Tarmizi Azizan from Universiti Malaysia Kelantan; Prof. Dr. Esther Daniel and Prof. Dr. Wah Yun Low from University of Malaya; lecturers of the Faculty of Creative Technology and Heritage, and faculty administration for this support and involvement in this reviewed. Last but not least, to beloved families' assistance has been very valuable and inspiring to us. We are sincerely grateful to their fullest support, guidance and advice.



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ID NO.: UMK 006

**AUGMENTED REALITY AS AN ENABLER TOWARD ENHANCING
INNOVATIVE TEACHING AND LEARNING FOR CULTURAL
HERITAGE IN HIGHER EDUCATION**

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Highlights: Augmented Reality (AR) is the one of the nine pillars of technological advancement to the Industry 4.0 (Pierdicca, Frontoni, Pollini, Trani, & Verdini, 2017). AR to provide users with real-time information and transform traditional teaching methods into more interactive teaching methods. Also, improve the user's learning experience more fun, enjoyable and memorable. The objectives of this project are to support for different learning skills, learning styles and levels of knowledge, to motivate and increase the interest for the teaching and learning cultural heritage subject and to promote active engagement by using AR technology. In the project, the Three-Dimensional (3D) objects were created by using 3D software such as Blender or other 3D software. Moreover, the animation videos were created by Vyond. After that, to build the AR applications by Unity, Vuforia and Layar for generating the AR markers. The main outcome from this project is the to use these created AR markers for teaching and learning in cultural heritage subject. Also to apply AR technology for improving the user's learning experience on mobile devices. A questionnaire was designed to ascertain the participants' perceptions about application of AR in cultural heritage. Overall, a majority of the respondents demonstrated positive attitudes toward the use of the AR technology. This technology can be very helpful in education and cultural heritage fields.

Key words: *Augmented Reality, Higher Education 4.0, Heritage, Web 2.0 Tools*



Introduction

The main objective of this project is to present the application of AR in the context of teaching and learning of interactive multimedia for heritage. This project also introduces the knowledge and skills for developing the AR models and experience interactive features on mobile devices. The main outcome from this project is the to use these created AR markers for teaching and learning in heritage subject. Also to apply AR technology for improving the user's learning experience.

Objectives

1. Support for different learning skills, learning styles and levels of knowledge.
2. Motivate and increase the interest for the teaching heritage subject: SCM 3173 Multimedia Technology in Museums.
3. Promote active engagement by using AR.

Novelty

1. Industry 4.0: The 9 pillars of technological advancement
2. Transform traditional teaching and learning methods into more interactive teaching and learning methods.
3. Improve of user experience by using AR.

Creativity & Innovation

1. Integrate the AR technology in education.
2. Create the creative contents.
3. Inspiring creative learning.

Value Added

1. Save time and cost.
2. Organization of teaching process.
3. Development of quality of teaching.
4. Development of learners' skills.
5. Testing and development of educational Information and communication technology (ICT).
6. Apply AR technology in Kelantan's museums.

Usefulness

Students

1. Can access models from any device at any time.
2. More motivated to learn.
3. Retain more knowledge for a longer period with AR models.
4. Able to apply latest AR technology.

Program

1. Transform classroom with interactivity.
2. Increase participation in classes.

Commercialisation Potential

1. Paid Course.
2. Copyright materials.



3. Sell the creative contents.

Acknowledgement

We are grateful for the Center for Teaching and Learning and the Faculty of Creative Technology and Heritage, Universiti Malaysia Kelantan (UMK) giving us the opportunity to participate in the International University Carnival on E-Learning 2018 (IUCEL 2018).

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ID NO. UMK 007

TOPIC: E-ASY ENGLISH

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Abstract: E-asy English is an interactive platform (educational website) offered to assist Basic English language learners to master English language skills. It was designed by using MOOC as a platform for website development, based on ADDIE instructional design model. The website was designed based on students' need, opinions and suggestions, which was evaluated by the students involved in this study, selected among UMK students who were studying the English Language. The course is delivered mainly through instructional videos, followed by interactive practices and quizzes. The course contents are specially designed to promote learners' knowledge retention. E-asy English consists of 14 conducive modules with different learning themes to create a fun engaging learning experience, each constructively aligned. The modules encompass crafted instructional videos containing concise explanation, info graphics, refreshing music and instructor's voice-over – all delivered through an illustrative storyboard. The students can monitor their progress as immediate feedbacks will be provided upon task completion.

Key words: MOOC, learning English, e-learning.

6. INTRODUCTION

E-asy English is an invention of educational website which provides better solutions for English language learners to meet their basic needs to master English Language without having to attend a face-to-face class. It was invented via Massive Open Learning Course (MOOC) which is a platform for website development, specifically designed based on ADDIE instructional design model.

7. BACKGROUND

E-asy English was invented in the context of an ever widening expansion of English learning and teaching around the globe and simultaneous development of the use of technology in educational and commercial contexts. To structure the development of this module, an instructional design model known as ADDIE, an acronym for Analyze, Design, Develop, Implement, and Evaluate, was used. It was first designed in the 1975 by the U.S Army by the Centre for Educational Technology at Florida State University, and has been used to develop courses in diverse fields (Piskurich, 2015). The following figure displays the stages of the ADDIE model:

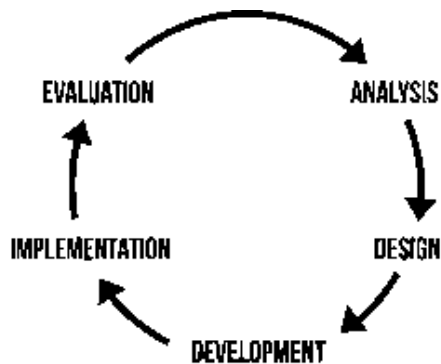


Figure 3: Five stages of the ADDIE model

The process of the invention encompasses 5 stages: (Analyse, Design, Development, Implementation, and Evaluation stages). The need analysis stage was conducted on UMK students to investigate the students' need and their problems in learning English language. Followed by designing stage in which all the course learning objectives were constructively aligned and meet the requirement of the international language standard (CEFR- Common European Framework Research). During the third stage (development stage), the course contents and assessment were prepared, followed by the website development and pilot test. In the implementation stage, the website was used as the main online platform in assisting the English language learners in UMK. In order to get the feedback of the users for the betterment of this invention, evaluation stage was implemented where the course was evaluated by the students. The content of the modules was always upgraded based on the current advancement of technology as well as the users' feedback.

8. IMPORTANCE TO EDUCATION

E-as-y English is important as it has made education easy for everyone. The information now can be accessed, talked and shared anywhere by everyone. The users of E-as-y English will apprehend more knowledge without bureaucratic obligations. Further, the easy access to Internet nowadays will assist formal learning and distance learning easily. The users can learn at any time and any number of times, anywhere, and with the assistance of technology such as smartphones or tablets, the users can interact in real-time with real people.

E-as-y English also allows educators a higher degree of coverage to deliver regular contents. This will ensure consistency in learning. Finally, Easy English is important to the education as it can present unique opportunities for people who are developing their confidence in using English in their daily life, without having to give up the comforts of the environment they are at ease with.

9. ADVANTAGES OF E-ASY ENGLISH

E-as-y English offers numerous advantages towards education and community. Firstly, it provides authentic learning materials to the users. For instance, the use of Green Screen Technology in producing content videos increases the authenticity of the materials. Secondly, it provides multiple-way communication, unlike the two ways as used in traditional classrooms in learning English language. Through this platform, students can collaborate with their peers, and get feedbacks from instructors in their English learning. Another advantage is the interactive learning. Some of the videos in the modules were produced by using Edpuzzle, an online tool that allows users to watch and engage with videos while the instructor gathers data throughout the lesson. For E-as-y English, while watching videos in the module, the users need to answer the pop-out questions in some parts of the videos before they can proceed with watching them till the end.



E-tag performance indicator is another advantage of E-asv English. The users can view their performance based on skills; reading, writing, speaking and listening, to know either they are good or weak as there will be collectively indicator for each skill as they answer all practices in the modules. E-asv English also provides Completion Award for the users. This award will be issued by the English Department of *Universiti Malaysia Kelantan*, for those who have successfully completed all the modules in E-asv English. Further, the integration of external programs such as Youtube, Padlet, Edpuzzle, Quizlet and others by using iFrame technique in MOOC reflects the massiveness of fun English language learning tools in this invention.

In addition, the learning objectives for this invention are constructively aligned and have the best e-assessments; each practice in the modules is aligned with the international language standard requirement. Other advantages are the possibility to get immediate feedback, and it provides opportunity for all users around the world to learn despite economic constraints, geographical boundaries or physical disabilities.

10. COMMERCIAL VALUES

E-asv English can cater to the users who are comfortable communicating in the virtual dimension, both in writing and orally. It can also possibly work for people in the industry who are in need of English since it offers basic English learning. Finally, this invention can be promoted to schools and colleges for students to learnEnglish.

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ID NO. UMK 008**TOPIC: Digital Social Media Crowd-Teaching Strategy for
Enhancing Teaching and Independent Learning**

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Abstract

The major challenge of blended learning approach is how to encourage student to learn independently and utilizing the e-learning platform for collective, interactive, flexible and personalize knowledge. Digital Social Media Crowd-teaching strategy model illustrate the utilization of Digital Social Media Capability for enhancing teaching and independent learning of blended learning and virtual learning approach. This project innovation aims to optimize the usage of digital social media (i.e. Facebook, YouTube, etc.) to enhance teaching and student's independent learning which was termed as Crowd-teaching. Crowd-teaching is a strategy that enhances the accumulative intelligence of virtual community through social media platform. We applied a collective intelligence framework to characterize crowd-teaching in the context of a Social media tool for academics. The proposed strategies could become a novel approach in designing the most appropriate virtual and immersive teaching and learning environment especially at higher education level and for long life learning.

Introduction

The introduction of web 2.0, the social web, has had a profound effect on behaviours, particularly those of young people who has born and live with it. They inhabit it with ease and it has led them to a strong sense of communities of interest linked in their own web spaces, and to a disposition to share and participate (CLEX, 2009). This indicates that digital age students prefer an active learning environment that is social, participatory and supported by rich media.

In addition to that, with the widespread availability of high-quality online resources, called open educational resources (OER), via the Internet, these resources have substantially help teachers as designers of curriculum, lesson plans and classroom activities. The way they teach and conduct classes has never been the same anymore. Besides that, teachers or lecturers nowadays are bombarded with multiple tasks besides teaching such as research projects and management jobs hence it is beneficial for both students and teachers to capitalize the usage of social web such as Facebook group to support teaching purposes whenever needed. These simplistic interactions are made even more accessible with the wide use of mobile devices that enable students to access course contents, as well as interact with teachers and student colleagues at all time and wherever they are located in (Rodriguez, 2011). In Malaysia, according to Suruhanjaya Komunikasi dan Multimedia Malaysia, as in 2016, there are about 21.9 million social media users and 97.3 percent of that claimed

that they own Facebook accounts while smartphone remained the most popular means for users to access internets with 89.4 percent usage and another 36.3 percent use other mobile devices such as netbook/notebook or laptop.

However, higher education institutions are still primarily relying on traditional platforms such as course and learning management systems (CMS/LMS) that do not capitalize on the pedagogical affordances of social media for example allowing learners to manage and maintain a learning space that facilitates their own learning activities and connections to peers and social networks across time and place (Dabbagh, 2012). Thus, the objective of the study is to develop a comprehensive teaching and learning platform by integrating free social media platform with the institutional teaching and learning platform. Secondly is to enhance teaching and learning experienced through independent and interactive platform.

Crowd-teaching

The term crowd-teaching originates from the ability of social media platform that enables the sharing of knowledge from all contributors. It enables the sharing of collaborative activities not only in social but also in educational, and, now increasingly, in business contexts. There is strong evidence that social media can facilitate the creation of private learning experience (PLEs) that help learners aggregate and share the results of learning achievements, participate in collective knowledge generation, and manage their own meaning making (Dabbagh & Kitsantas, 2012).

It is believed that through these shared and networked activities, users will become creators of collaborative knowledge that forms a collective intelligence. Collective Intelligence is not something new but the capability of social media software to pull together all the knowledge harnessed through collaborative activities makes the process more accessible to learners (Lim et al, 2013). Levy (1999) cited by Nielsen, (2010) defined collective intelligence as "a form of universally distributed intelligence, constantly enhanced, coordinated in real time, and resulting in the effective mobilization of skills...No one knows everything, everyone knows something...".

Looking from the view of learners in this digital-age, where the line between a student and a teacher has been blurred, the role of teacher as passive information contributors has changed; rather, these teachers can be seen as both contributors to and consumers of crowd-teaching processes. To apply a collective intelligence framework to characterize crowd-teaching concept in the context of social media tool for academics will not be successful without the role of mobile computing devices. In reference to Gikas & Grant (2013), applications of mobile computing devices and social media can be summarised into three groups (a) engaging learners with constant connectivity, (b) fostering collaborative learning and (c) enabling authentic learning on the move. These three characteristics enable the crowdteaching process move swiftly.

Product creativity and Innovation

The integration using the available social media platform can complement the university e-learning platform. The integration approach also combining various social media advantages to improve teaching and learning. Another advantage is it is a self directed independent learning integration platform where no specific training needed before using the platform. Value added using this digital platform is freedom of expression, encourage independent learning, and low cost implementation. Usefulness are encouraged innovation and student's creativity and proactive communication for knowledge creation.

Novelty

Contribution to the best practices in integration of crowd-teaching and blended learning in virtual immersive environment. Provide an effective solution through artificial intelligence and big data technology in designing teaching and learning immersive platform. Immersive learning are peer to peer learning, live video communication, experiential learning through virtual environment and collaborative work for expending the knowledge.

Conceptual Model

Digital Social Media Crowd Teaching Strategy Model illustrate the interrelated and relationship of digital social media capability to support proactive independent teaching and learning for crowd teaching. The major challenge is how this approach could encourage students to learn independently utilizing the collective of knowledge from everyone participate in the class. The innovation proposed the Crowd teaching strategy through Digital Social Media for learning and improves the student independent learning. The strategy could enhance the accumulative intelligence of virtual community through social media. We applied a collective intelligence framework to characterize crowd teaching in the context of a Social Media tool for academics. The proposed strategies could become the novel approach in designing the most appropriate virtual and immersive teaching and learning environment especially at higher education level and for long-life learning.

Proposed Conceptual Model The conceptual model in Figure 1 below was developed to guide the research process and interpret the data from within the theoretical context.

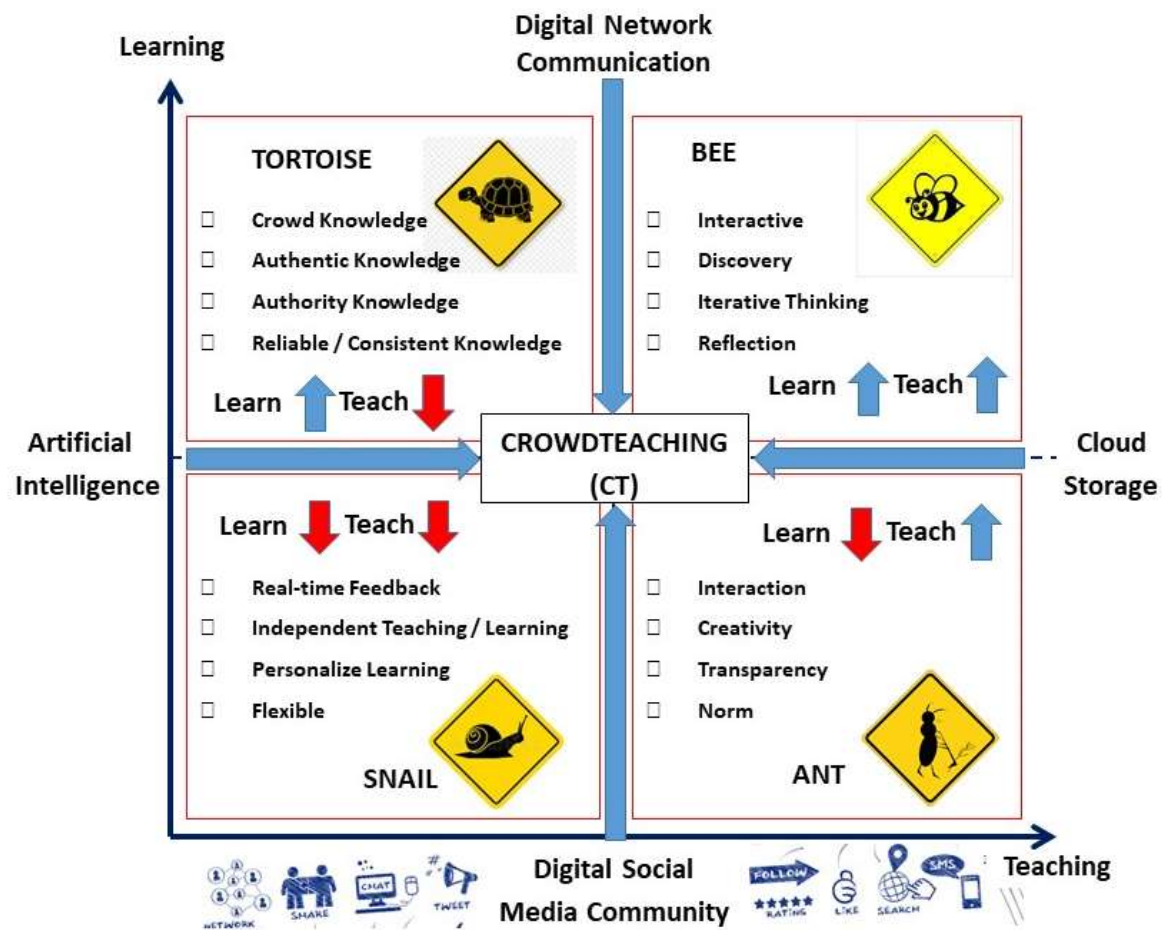


Figure 1: Digital Social Media Crowd Teaching Strategy Model

The conceptual model we develop based on the digital community that used the media social for teaching and learning. From the activity analysis and small survey of the respondent who use the platform for teaching and learning, it's show several pattern of how the community utilize the crowd-sourcing in teaching and learning using digital social media strategy. Generally, there are four types of social media community teaching and learning pattern which is represented by snail, tortoise, ant and bee.

Conclusion

It is concluded that Digital Social Media Crowd-teaching strategy model innovation that aims to optimize the usage of digital social media (i.e. Facebook, YouTube, etc.) able to enhance teaching and student's independent learning. Cumulative intelligence of virtual community through social media platform can be gathered and all participants either learners or teachers can interact and share their ideas through what we termed as Crowd-teaching.

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ID NO. UMK 009
TOPIC: Comixs: from Creative Application to Interactive Publication
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Abstract:

Pembelajaran bahasa Arab di Universiti Malaysia Kelantan yang menekankan kemahiran komunikasi lisan dan bertulis menuntut penglibatan pelajar secara aktif dalam aktiviti-aktiviti praktikal semasa kelas berlangsung. Hal ini telah direalisasikan dengan penerapan penggunaan aplikasi MakeBeliefsComix.Com yang menyediakan platform dalam talian (*website based*) dengan beberapa fungsi dan langkah mudah untuk pengguna mencipta komik tersendiri. Hasil daripada kepenggunaan aplikasi kreatif ini dalam kalangan pelajar pada mulanya, telah mencetuskan idea untuk kami mencipta, menyusun 50 komik dengan perbualan ringkas bahasa Arab dan seterusnya akan menerbitkan sebuah buku komik yang berjudul '*Comixs: Comics Compilation Of Simple Arabic Conversation بالعربية With English Translation*'. Untuk menjadikan penerbitan ini lebih menarik, efektif dan interaktif, kami memasukkan 3 elemen utama, iaitu; elemen gamifikasi, multimedia dan teknologi digital. Elemen gamifikasi adalah permainan kad imbas (*flashcards*) dengan tatacara permainan seperti *Happy Family* yang disediakan bertujuan mengenal pasti beberapa kosa kata mudah secara bergambar. Elemen multimedia diterapkan dengan teknologi *Augmented Reality (AR)* dengan langkah; imbas komik, lihat dan dengar video bagi memastikan komik yang diterbitkan bukan sekadar untuk bacaan, bahkan dapat dipelajari cara sebutan dan intonasi yang sesuai. Elemen teknologi digital pula melibatkan *flipbook* yang turut disediakan secara imbasan QR Code di buku komik bagi memudahkan pembacaan di alatan digital seperti; komputer, telefon pintar dan tablet/iPad. Untuk pameran inovasi kali ini, kami membentangkan draf penuh bagi komik interaktif dengan elemen-elemen yang bakal diterapkan, manakala proses penerbitan komik ini dijangka siap sepenuhnya dan mula dipasarkan pada akhir tahun ini.

Key words: *Arabic comics, makebeliefcomix, Arabic communication, online activity, language skills*

Content

Aplikasi dalam talian yang diguna pakai adalah MakeBeliefsComix.Com diakses secara percuma dan tiada kawalan *copyright* melalui <https://www.makebeliefscomix.com/Comix/>. Ini jelas ditunjukkan pada awalan (*home*) laman ini yang meletakkan kenyataan seperti *Printables* (boleh dicetak), *Free E-Books* (e-book percuma) dan lain-lain. Penggunaan untuk proses PdP bahasa juga sangat dialu-alukan dengan penekanan kepada kemahiran bertulis yang juga dinyatakan pada awalan (*home*) laman "...writing fun!...create your comix in any language!".

Keistimewaan aplikasi ini adalah fungsi-fungsi untuk mencipta komik tersendiri yang dimulakan dengan menekan butang *Create Your Comix*. Fungsi-fungsi yang disediakan adalah panel komik yang bertindak sebagai petak untuk menyusun idea komik. Maksimum panel komik adalah sembilan panel. Bagi setiap panel, boleh diletakkan templat latar belakang, karakter komik, belon skrip, perkataan-perkataan pilihan dan objek tambahan yang bebas disusun mengikut kreativiti. Selain itu, setiap panel juga disediakan butang untuk menggerakkan susunan templat (*move*), mengubah saiz skala templat (*scale*), mengalih ke hadapan templat (*bring to front*), menterbalik kedudukan templat (*flip*) dan membuang templat (*delete*).

Fungsi templat latar belakang terdiri beberapa lokasi yang menjadi tunjang utama dalam memulakan penciptaan komik. Latar belakang dipilih berdasarkan kesesuaian dengan situasi skrip perbualan yang akan dimasukkan. Setiap panel untuk satu komik tidak terhad dengan satu latar belakang sahaja, penukaran latar belakang adalah bebas.

Fungsi templat karakter terdiri daripada beberapa watak komik yang meliputi pekerjaan, umur, gaya dan cara pemakaian. Sebagaimana latar belakang, karakter juga boleh bebas dipilih mengikut keperluan situasi komik yang akan dicipta.

Fungsi-fungsi lain, seperti belon skrip, perkataan-perkataan pilihan dan objek tambahan dijadikan sebagai bahan sokongan untuk proses penciptaan komik dalam aplikasi ini.

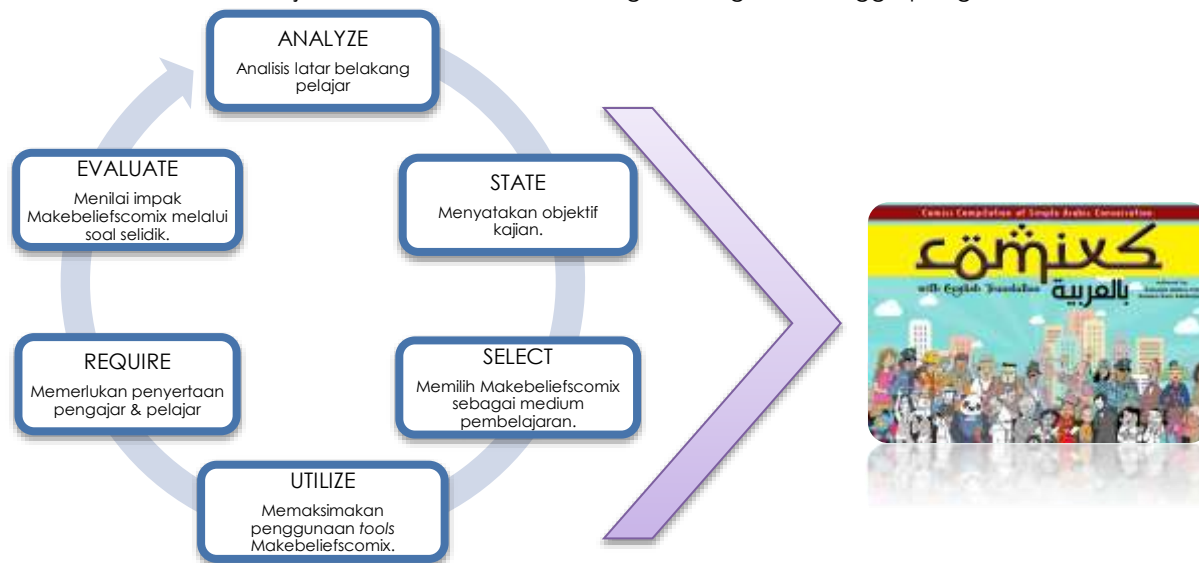
Setelah semua selesai, komik telah tersedia, butang cetak dan emel disediakan bagi memudahkan simpanan komik yang siap dicipta. Emel akan dihantar di dalam bentuk link yang boleh diakses terus ke komik yang siap.

Creative Application yang dimaksudkan dalam topik ini adalah MakeBeliefComix.Com sebagaimana dinyatakan fungsi di atas. Aplikasi ini telah diguna pakai dalam aktiviti pembelajaran untuk para pelajar kursus bahasa Arab komunikasi di Universiti Malaysia Kelantan. Hasil daripada aktiviti pembelajaran dan kepenggunaan aplikasi ini secara kreatif oleh para pelajar, telah mencetuskan idea pengajar untuk menerbitkan satu komik dengan penerapan tiga elemen, iaitu; elemen gamifikasi (flashcards), multimedia (Augmented Reality – AR) dan teknologi digital (flipbook). Penerbitan yang interaktif iaitu komik bahasa Arab dengan elemen-elemen berikut terhasil, dan itulah yang dimaksudkan dengan *Interactive Publication*.

Process of Development (Model)

Proses aktiviti pembelajaran, kepenggunaan yang seterusnya menghasilkan penerbitan adalah berdasarkan model kajian ASSURE yang merupakan model yang sangat dikenali dalam proses reka bentuk melibatkan integrasi multimedia dan teknologi bagi menghasilkan suasana PdP yang efektif dan kreatif (Patrick Daniel Callison, 2002; Lefebvre, 2006; Nur Aisyah, 2012). ASSURE merupakan akronim yang mewakili setiap langkah dalam model ini.

Gambar Rajah 1: Model ASSURE dan langkah-langkah sehingga penghasilan komik



Important to Education

Menurut Beisenbaeva (2017) dan Farah (2016) penggunaan komik dapat meningkatkan motivasi pelajar, di samping kepelbagaian ekspresi karakter komik yang memudahkan kefahaman pembaca dan menghidupkan suasana media interaktif. Selain itu, aplikasi komik dalam talian lebih fleksibel dan mesra pengguna dengan fungsi pengubahsuaian karakter yang diinginkan, penyimpanan komik dalam bentuk elektronik buku (e-book/PDF), perkongsian ke laman sosial dan pencetakan *hard copy* (Bill, 2018; Christopher, 2011). Pada masa yang sama, penerapan teknologi dan multimedia turut memberi impak positif dalam pembelajaran bahasa secara aktif dan efektif (Norhayati, 2013).

Justeru, pemanfaatan aplikasi komik dalam talian secara kreatif seterusnya penghasilan komik dengan penerapan elemen-elemen interaktif seperti yang dinyatakan terbukti memberi kelebihan yang optimum dalam pendidikan dan khususnya dalam pembelajaran bahasa secara lebih menarik dan efisien.

Commercial Value

Buku komik deraf yang mengandungi 50 komik dengan perbualan ringkas bahasa Arab dengan terjemahan ke bahasa Inggeris telah siap disediakan dan akan melalui proses semakan. Komik berjudul 'Comixs: Comics Compilation Of Simple Arabic Conversation بالعربية With English Translation'. Di samping itu, proses permohonan pengkatalogan *International Standard Book Number (ISBN)* juga telah dilakukan melalui Syarikat Penerbitan Abadi, Kota Bharu, Kelantan yang telah bersetuju untuk menerbitkan dan mencetak komik yang bakal dipasarkan pada akhir tahun ini (jika tiada sebarang masalah).

Acknowledgement (if any)

Jutaan terima kasih kepada para pelajar UMK di Kampus Pengkalan Chepa yang terlibat secara langsung dalam menjayakan aktiviti pembelajaran menggunakan aplikasi sehingga tercetus idea pembentangan untuk pengenalan aplikasi MakeBeliefsComix.Com dan penghasilan produk komik yang akan diterbitkan dan dikomersialkan. Di samping itu, diberikan kredit sepenuhnya untuk pemilik aplikasi dalam talian MakeBeliefsComix.Com yang menyediakan aplikasi dan fungsi-fungsi untuk kegunaan secara terbuka dan percuma.

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ID NO. UMK 010

**TOPIC: EDUCATION E LEARNING AND E- PORTFOLIO :
RHINOMOOC : AR PORTFOLIO**

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Abstract

The rapid transformation of our world can be seen in all aspects including Teaching and Learning Method. Thanks to the digital revolution which enhance educator's and student's motivation and effectiveness. This advancement is helpful until it becomes essential method used by professionals, educators and teachers. Students are not necessarily going to class for learning and studying. By creating a new learning method, which refers as RhinoMooc using different technology tools (Software, Websites & Social Media), it is possible for the students learn simply through their gadgets anywhere at any preferable time. RhinoMooc is designed for 3D courses e- learning which involves 3 steps and process. Firstly, 3D will be learned using social media platforms such as Youtube, Facebook, secondly E-Portfolio learning in Pathbrite and lastly, producing AR- Portfolio 3d Modelling using free Augmented Apps Tool.

Key words: Education E- Learning , 3D Modeling , Digital Platform Education , Online Classroom,, E-Portfolio, Augmented Reality

What so important about Education E Learning & E- Portfolio RhinoMooc : Ar Portfolio?

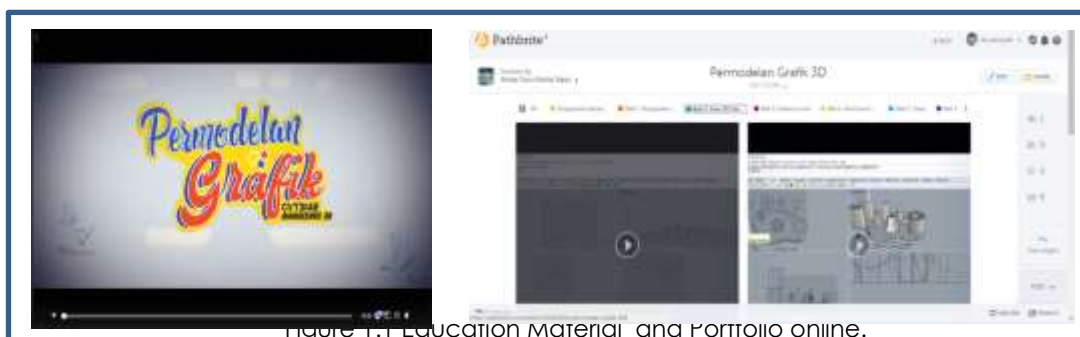


Figure 1.1 Education Material and Portfolio online.

RhinoMooc has been through the first phase which are the creation of the Digital Teaching Tools and Learning through Social Media Platform (Facebook, Youtube). However , the researcher found that the result of the process from 3D Graphical Modelling Learning ended on visuals (Jpeg files) and if it is printed, only 2D images are displayed as portfolio materials. Therefore, the researcher create another special platform for

Portfolio, which is Pathbrite and could be worked effectively by combining together with the Augmented Reality (AR) Software. This technique or idea allows 3D artwork models being visualized simply by holding or scanning the gadgets (android phone or I Pad) on top of the paper (which have the 2D images).

Advantage

Through this Learning Method, students can easily provide a better portfolio and work outcomes which may lead to increase their level of confidence during interview session. This new learning method innovation is completely effective for 3D courses for student's understanding enhancement. It is user friendly, simple and portable and all the process occurs simply by using their personal devices and gadgets.

Commercial Value

This innovation should be spread and widely used by our communities. Teaching service can be easily held at any institutions, schools, colleges and workshops. Last but not least, universities can generate more income by commercializing this method for the production of Augmented Portfolio.

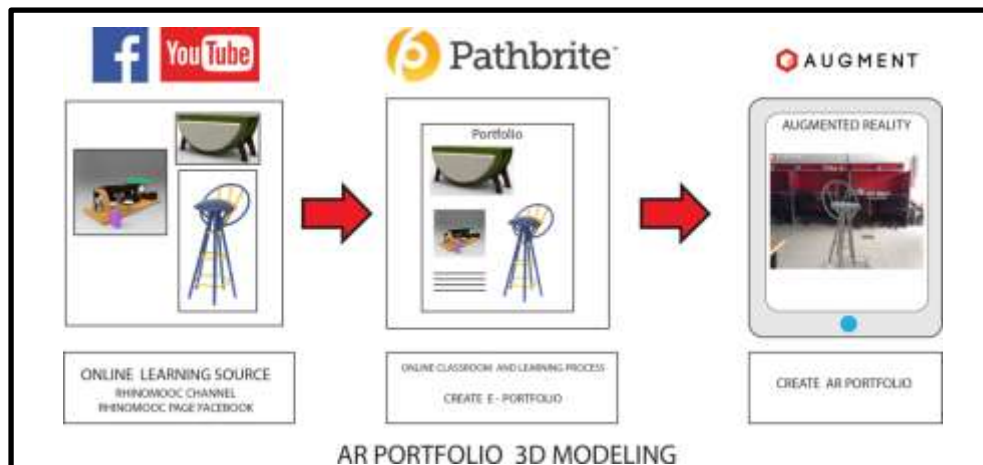


Figure 1.2 The Process of Learning RhinoMooc: AR Portfolio

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ID NO. UMK 011	TOPIC: Mobile Learning Framework: Gamification of Language Teaching and Learning

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Abstract: Digital technology has increasingly engaged remarkable public attention and this has contributed to the formalisation of media use in teaching and learning. Studies have suggested guided usage of mobile devices in learning is necessary. This framework suggests appropriate web applications that match with a particular language skills development: listening, speaking, reading, writing; and functions as a guide to assist in students' mobile learning. Current education system has to be tuned towards providing 21st century skills needed by the learners to survive namely collaboration, creativity, critical thinking and communication. In attaining the mentioned skills, there is no other way other than embracing mobile learning as through it, the incorporation of the skills is seen as possible. Mobile learning therefore, encourages learners' collaboration through various learning application available be it inside or outside classroom. Language learners can also use mobile learning platform to sharpen their creativity and critical thinking skills through myriad of reading materials and information that they can get at their fingertips. Finally, mobile learning irrefutably would enhance learners' communication skills through the usage of communication devices such as smartphones and tablets in language lessons. The mobile learning framework provides guidance to language instructors on how to integrate mobile applications with language lessons effectively.

Key words: *English language, gamification, guided mobile learning, intervention design*

1.0 Mobile Learning Framework

This Mobile Learning Framework design is a product of thought that is based on the idea of 21st century learning. The product is a design of how mobile applications can be integrated into the language syllabus. This is something that has never been studied and produced before. Therefore, the mobile learning framework is a framework that shows language instructors on how they can make use of mobile learning applications available online by integrating them in the language syllabus of their teaching and learning, without creating a totally



different lesson. The framework describes in detail the useful mobile learning applications and how they can be beneficial specifically in each language skill namely listening, speaking, reading and writing.

This mobile learning framework is in fact in line with 21st century learning, as it achieves the followings; 21st century learning considers a number of aspects that demand the instruction in a particular lesson to be student-centred. This means that education should be lesser that a teacher giving a lecture about a topic, rather learners are given tasks to be solved. Solving problems thus should involve students acquiring proper information that can be done through the incorporation of technological devices and the Internet in classrooms. Other than that, 21st century learning also concerns collaboration between learners (Nichols, 2018). This is seen as a crucial factor that prepares learners for future survival where they will have to work with people from different cultures and backgrounds in the borderless world and that they need to have proper skills and knowledge about the world to do so. The implementation of mobile learning for instance is in sync with this particular idea of 21st century learning where learners can access myriad of knowledge about cultures and nations, world's problems and solutions to be discussed in a problem-based classroom. From a language learning perspective, the idea of collaborative learning is sensible as language is a tool to share ideas and opinions while it serves to bridge people of different background.

Gamification of Language Teaching and Learning

The development of today's technology has created a generation of students who are thirsty of the richness of resources on digital media. Moving forward, instructors, especially language instructors should be aware of recent changing trend and adapt the content delivery method to suit the intended audience. Nevertheless, studies (Ng et al, 2016; Barrs, 2011) have suggested that the presence of a comprehensive guide for mobile learning is a necessity to ensure that all mobile interventions are not merely creating a fun environment, but assist in effective delivery of the course contents. In gamifying learning, there are several main web learning tools that are used to create an interactive learning environment for the students, allowing them to express themselves, collaborate and have fun while learning new skills.

Reading Gamification

a) Kahoot

Traditionally reading comprehension is taught by teachers through assigning a reading article and students' job is to read, look up new terms, and answer the reading comprehension questions. Such method is quite boring and tedious. Many students find it mundane and weak students feel fearful of reading as they could not understand a reading passage which contains lots of words. To make the reading session more fun and effective, a learning tool called Kahoot - a free application which allows teachers to create multiple choice quiz questions that students can answer using any mobile device is used.

Teachers can create quizzes using multiple choice questions presented in a game-based format to students. The quizzes contain questions that have up to four possible choices, and questions can contain various multimedia contents such as pictures or videos. Besides, teachers could also select the amount of time that the students have to respond to each question. This will stimulate a lot of excitements in the classroom as students compete with each other to answer the questions accurately. The students join the game via a specific generated game code and are able to create their own nicknames to be displayed on the game screen.

This interactive game offers students an opportunity to collaborate with one another to decide the right answer choice for the question. Students have to refer to the reading article for the information, but they have to discuss with their group mates to ensure that their answer is right. The limited time also urges students to make fast decisions, which later helps them practice choosing the answer choice(s) quickly but accurately.

Speaking Gamification

a. Coggle (<https://coggle.it/>)

Coggle is a simple but powerful online mind mapping tool that's easy and fun for students to use. Mind maps on a variety of topics can be quickly made and can be enhanced by using colours and icons and uploading images. It has a variety of uses in language teaching (for example it could be used to build word families for vocabulary skills) but it's particularly useful in helping students to plan short or long talks or speeches, either impromptu or more formal. The screenshots below show a simple structure for a short talk that students can easily populate with their own ideas and can adapt by adding or removing branches as needed. This helps them to structure and plan their speech and enhances confidence and thus fluency. Mind maps can be shared on line with other students to allow collaborative work. Coggle is free to use (there is a paid upgrade but the free version should be adequate for most student needs).



Figure 1: Students can be given a topic in class, with 10-15 minutes to prepare a 5 minute talk. They can adapt the Coggle outline to structure an effective talk.

b. Cambridge Learners Dictionary (<https://dictionary.cambridge.org/dictionary/learner-english/>)

The online Cambridge Learners Dictionary is an excellent tool for helping students to build comprehension, vocabulary and pronunciation, which has a strong flow on effect on their general speaking ability. It offers simple definitions which should be readily understood by students from CEFR A2 on. It's particularly useful in helping students with their pronunciation, as each word defined is accompanied by UK English and US English recordings. The recordings are clear and easy for students to reproduce.

For classroom use, students can be tasked to prepare a short talk and to check the pronunciation of any words they are unsure about. For example, Malay speaking students often struggle with the word 'suggest' as they are unsure whether the double 'g' should be hard or soft. They may also be confused by words such as 'business', which is spoken with 2 rather than 3 syllables.



Figure 2: A screenshot of Cambridge Learners Dictionary page

Listening Gamification

a. Padlet (<https://padlet.com/>)

Padlet a kind of interactive platform on which collaborations of all kinds takes place. Padlet can be used in the classroom for a variety of purposes and for the teaching and learning of English language, Padlet can be useful for listening activity in a couple of ways. Through the activity sample explained below, not just it could enhance listening skill, it could also improve students' listening comprehension and indirectly their critical thinking skills on how to improve their speaking skill.

First, instructor sets up a Padlet link for students to access using their smartphones or tablets. The instructor then gets students to find a topic for a short individual presentation. The topics can be within a specified theme such as science, invention, history, self or arts. Instructor can give students a few days or a week to research on the topic chosen and prepare for the short presentation where they are required to present for a maximum of five minutes. Students will take turn to present in front of their classmates. Instead of listening to their classmates' presentation, the student-audience will access Padlet and share what they think of the presentation.

Instructor can earlier give a guideline of what they can comment on such as the main idea of the speech, how the content is informative or the way the speech was delivered. In their comment box on Padlet, students will put the names of the presenter, or the number (the turns of the presenter) followed by the comments. This activity using Padlet will be useful in this kind of lesson, as student-audience will have to pay attention to their classmates' presentation in order to share what they think about it. This would of course enhance their listening skill, as they will have to pay attention to specific details in a speech as in a guided activity.

The comments that they have written will be automatically shared with other students in the class where indirectly, they will learn the useful tips on how to be a better presenter or speaker in the future.

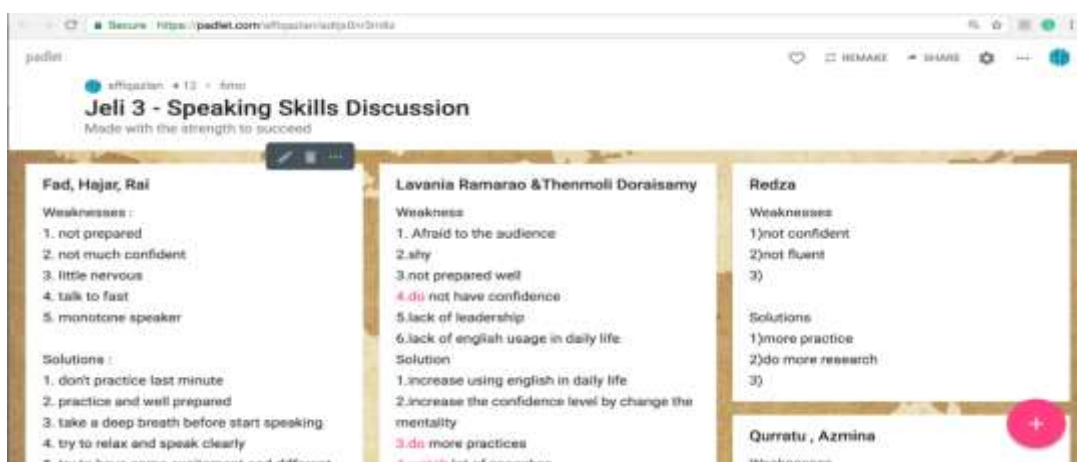


Figure 3: A screenshot of the Padlet platform where students' share their thoughts on their classmate presentation.

Writing Gamification

a. Practice English Grammar

Having a good command in English requires one to have good grammar. In writing, grammar provides information that helps the readers' comprehension. Hence, in order to improve writing skill, learners have to have good grammar. Featuring a combination of flash cards, questions, games, articles and specific feedback, Practice English Grammar application helps to improve learners' writing by taking them through a range of grammar topics from tenses to passive voice. Students gain input through flashcards and can test their knowledge with equipped quiz. By understanding grammar rules, students are expected to produce better English writing.



Figure 4: A screenshot of the Practice English Grammar's question

b. Coggle

Coggle is a collaborative mind-mapping tool that helps users to make sense of complex things. Students are able to create unlimited mind maps to communicate a particular concept and can easily share them with friends. In writing, Coggle is used to create graphic organiser for developing concepts and ideas. Students will use the graphic organiser or mind map as a guide so that a clear structured and elaborated writing could be produced.

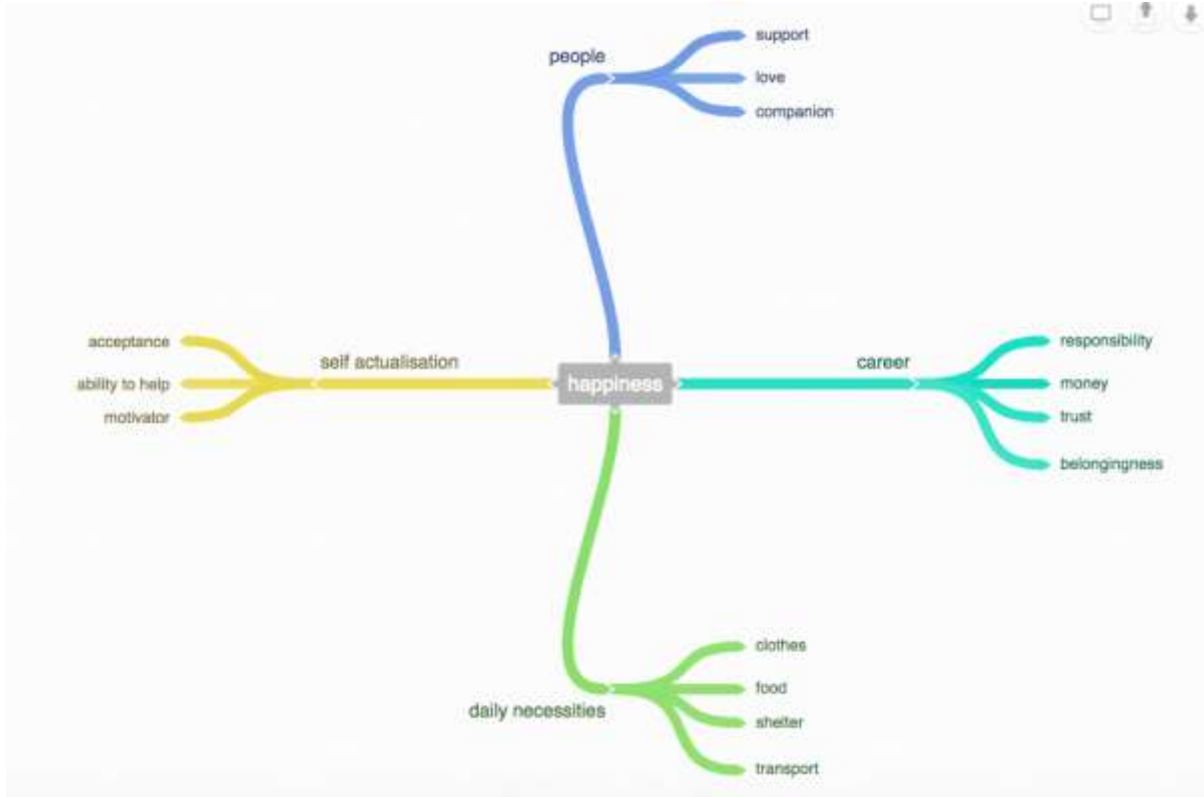


Figure 5: A sample of a mind map developed using Coggle

2.0 Background

The product of this innovation; the mobile learning framework, is a result of a gap found among studies on the usage of mobile phones in learning. A number of studies have been conducted on mobile intervention in language learning and its effectiveness. In general, scholars are divided into two opinions; one that favours mobile learning and believes it has positive impact on learning and second opinion that opposes the aforementioned notion of understanding. Among the studies conducted is the study by Wilmer, et. al. (2017) that believed that the body of empirical evidence demonstrating tangible effects of mobile devices on memory and knowledge is limited. Earlier, Sparrow et. al. (2011) argued that with the close relation to technology, people are remembering less actual information and instead commit to memory where such information can be found. As Wilmer, et. al. (2017) suggested, when people turn to mobile devices, they generally learn and remember less from our experiences. There are also notions that consider mobile devices in learning correlates with more intuitive but less analytic thinking as proposed by Barr, et. al. (2015).

Meanwhile a more extreme view on mobile learning such as the one proposed by Beland and Murphy (2014) contended that enforcing mobile phone bans in school is associated with better academic performance. Junco (2012) made it clear that the usage of social media in learning is negatively correlated

with academic performance as it is used more for socialising than learning. As opposed to the abovementioned views on mobile learning, there are also studies that support mobile usage in classrooms. As mentioned by Harley et. al., (2007) text messaging on academic matters between learners and instructors gave learners a sense of belonging and also made them feel they would do better academically. Yu (2012) believed smartphones have a huge potential to be used as a learning tool in higher education as it can be used to access thousands of materials and there are a lot of inexpensive but useful learning applications that can be integrated in learning using smartphones. As opposed to traditional teaching, mobile learning can benefit learners in many ways as suggested by Goh and Kinshuk (2006) such as games and competition in learning, classroom learning, laboratories learning, field trip learning, distance learning, informal learning, pedagogical and learning theory, learning and teaching support, mobile evaluation, requirements, and human interface. A number of these attributes can be associated with language learning. Talking about 21st century learning where collaboration is involved, Yu (2012) continued that digital technologies such as blogs, wikis, and interactive websites have ushered in a whole new era of information sharing and collaboration where these could be furthered when applied in mobile learning context.

Given the abovementioned arguments, the idea of generating a mobile learning framework (the product of this competition) took place.

3.0 Mobile Learning Framework Importance

The mobile learning framework is important to education due to the fact that the idea mobile learning as can be observe in literature is limited to occasional usage and not extensive as needed in 21st century education. Given the extensive debate on the strengths and weaknesses of mobile learning, the discussion mainly hovers around the idea of advantages and disadvantages. However, there is a lack in discussion on how proper guided mobile learning intervention can benefit learners as asserted by Kukulska-Hulme as cited in Ng, et.al (2016) that the possible influence of mobile devices on education and their impact is still unclear and is an evolving field of study. Hence, some researchers emphasized on the idea of guided mobile learning intervention. Barrs (2011) for instance recommended that detailed guidance and explanation on how to use smartphone appropriately in classroom settings is essential if meaningful learning is to take place. With the same understanding, Ng, et.al (2016), found that facilitating the usage of smartphone is crucial and the findings recommended future studies should focus on ways to facilitate learners' intentional behaviour towards the use of smartphones so that they will develop the capacity to use this device to assist their learning processes. This mobile learning framework therefore, being a result of a research, is a testimony that guided mobile learning in lessons is beneficial.

4.0 Advantages towards Education

As mobile usage continues to grow worldwide, the percentage of adaptation of mobile intervention in the classroom remains a debate due to its usage as simply to create a fun classroom rather than an impactful one. Most studies on the matter have confidently pointed to the benefits of student-centred learning rather than the more traditional approach of teacher-based. In line with this, the application of mobile devices as described in the discussion above relates more to the former than the later. This mobile learning framework therefore is hoped to enlighten language instructors and researchers in this particular field of study on the possibility of integrating guided mobile intervention effectively in enhancing class interactiveness thus leading to higher students' language performance. In the end, it is all about achieving the intended course objectives using the right medium.

5.0 Commercial Value

This framework suggests appropriate web applications that match with a particular language skills development (listening / speaking / reading / writing) and functions as a guide to assist in students' mobile learning. The framework will tremendously benefit instructors of English Language courses in enhancing their students' learning experience. Hence, this mobile learning framework based on gamification of teaching and learning could be spread and commercialized to all institutions offering English Language courses through development of specific modules catering different levels of English language proficiency.

Secondly, commercialization could be realized through consultation. Framework developers could serve as Gamification Consultants to provide professional advice based on the particular subject's syllabus. This is important because ideal mobile learning framework should directly complement the contents of the subject, resulting in higher knowledge retention of the students.

This mobile learning framework could also be replicated for the teaching of other languages (besides English) where skills development is concerned. Most of the applications suggested in the framework are also applicable for other language learning. Therefore, the gamification consultation could also be offered to interested organisations offering other language courses. In addition, since gamification is a new concept that might be foreign to other countries, gamification consultation for those countries carries high potentials.

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UMK 013	TOPIC: INTEGRATION OF ONLINE APPLICATION IN ELEVATING THE VALUE OF ENTREPRENEURSHIP LESSONS IN TRADITIONAL AND COMPLEMENTARY MEDICINE COURSE

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Abstract: Traditional and complementary medicine (TCM) is a course that supporting the spa and wellness components specifically to fulfill the requirement for individual treatment plan purposes. By using the application of particular modalities of therapy, the student is required to create an entrepreneurship project that bases on the wellness therapy that being taught in this course. Through the project, the student is able to learn about the business planning, management and operational aspect of a business which was focusing on spa and wellness components and many more that integrating both soft and hard skill required. The constructive integration of numerous online applications (such as Animaker, Wix.com, Facebook, Google Form and many more) as a medium for teaching and learning are believe to be able to increase the classroom environment and evoke the creativity of the learners.

Key words: *traditional medicine, entrepreneurship, evaluation, online application*

Introduction

This paper focuses on how to assess the entrepreneurial traits from student's journey throughout their experience taking a course of traditional and complementary medicine. Traditional and complementary medicine (TCM) is a course that supporting the spa and wellness components specifically to fulfill the requirement for individual treatment plan purposes. By using the application of particular modalities of therapy, student are required to create an entrepreneurship project that base on the wellness therapy that being taught in this course.

Through the project, student are able to learn about the business planning, management and operational aspect of a business which were focusing on spa and wellness components and many more that integrating both soft and hard skill required. This mechanism is aimed to assist both students and lecturers from the beginning of the idea brainstorming session to the final presentation of the project. Traditional teaching and learning session might become too common and make the students to easily lose their interest. Therefore, by applying this method in every learning session enable both students and lecturer to be up-to-date with the changes in education system.

Last but not least, applying this 2.0 web tools in teaching and learning not only can save time and cost for both from students or lecturers side but they also can boost up the creativity among students through video presentation and project updates. The visual presentation will be very useful tools and supervisor can identifies videos and photographs uploaded as evidence of the activities that can be observed.

ICT in Teaching and Learning

The application of information and communication technology (ICT) originally used for the purpose of elevating the effectiveness in educational course (Tearle, 2003; Ghaznavi, Keikha & Yaghoubi, 2011). According to Dede (1998), the use of ICT in learning process being proven as it can help in improving the information retention, elevate the enthusiasm and generally increase the ability of students in understand more on specific subject. Not only that, the usage of technology in teaching and learning can also be used to promote collaborative learning such as role playing and problem solving activities. Gamification is one of the techniques that can be used to increase participation of students in class (Lister, 2015).

We can see there is some important reasons why the education process specifically mentioned in the higher education institution such as the university need to be embedded with various online applications (Meerts, 2003; Henard, 2012; Higgins, 2012). According to Lisenbee (2016), the generational gap between educators and learners has caused much trouble especially in delivering information as this young generation cannot really embrace the bland and seem-to-be-lame pedagogy styles that being used in university. The educators in university need to plan for new techniques and at the same time try to implement the current style of online learning (such as the usage of 2.0 web tools, electronic journals, interactive quizzes session or doing the online classroom) in elevating the class experience as well as create changes in the nature of teaching and learning (Shinsky, 2011; DiBella, 2015).



Image 1: The activities involved in TCM subject as well as the online application that being used.

As we can see in Image 1, the integration of online application such as Wix.com for development and documentation of business profile and project updates; TCM Massive Open Learning Course (MOOC) and YouTube for continuous learning material that being uploaded and being shared; Animaker, Powtoon, GoAnimate, Renderforest that being used for the medium of presentation; and social media such as Facebook, Instagram and Twitter for the marketing purpose of the business project and evaluation of business performance through the Google forms.

It certainly helps to have strong technology skills or expertise in traditional and complementary medicine as well as spa key area, by defining characteristics of entrepreneurship. The traits key qualities such as creativity, the ability to keep going in the face of hardship, and the social skills were built, great teams. In this online learning mechanism, the skills to be a successful entrepreneur and related resources to develop the traits for successful entrepreneur were explored.

This contribution started with the objective to underline the need of online application as an action to elevate the entrepreneurial traits among students who's taken traditional and complementary medicine course. It is believed that by using the online application as a medium in teaching and learning process, it will increase the learner's potential while creating better environment for both educators and learners.

Table 1: Results on Acceptance of Online Application Implementation in Traditional and Complementary Medicine Course

Questions	Scale				
	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Each online application that being used in this subject (such as the MOOC, Youtube, Animaker, Wix.com, Facebook, Instagram, Renderforest, etc) require minimum guidance and time to access.	5.4% (7)	12.3% (16)	1.5% (2)	63.1% (82)	17.7% (23)
The online application makes this subject appear to be more interesting and interactive by making students to become creative at every stage of business project planning	2.3% (3)	1.5% (2)	3.1% (4)	41.5% (54)	51.5% (67)
Students are able to save a lot in term of printing cost for the report since they will change the traditional report in the form of a business website.	0.8% (1)	2.3% (3)	10.8% (14)	6.9% (9)	79.2% (103)
Students are able to develop and implement their creativity especially in 'video-replacing-presentation' methods with the implementation of various online applications such as Animaker, Powtoon, GoAnimate, etc.	10.0% (13)	11.5% (15)	2.3% (3)	72.3% (94)	3.8% (5)

The student thinks that teaching and learning session becomes even more interesting by embedding various online applications in every single activity that they do in the class.	6.9% (9)	8.5% (11)	0.8% (1)	48.5% (63)	35.4% (46)
The implementation of online applications will help in promoting the paperless approach to green management practices.	2.3% (3)	2.3% (3)	4.6% (6)	25.4% (33)	65.4% (85)

A simple survey was performed on 130 students that were completed the 16 weeks of teaching and learning for the traditional and complementary course. As illustrated in Table 1, there were six (6) questions being asked in a mini questionnaire as to get their opinion on the acceptance of the new methods of evaluation on the TCM course. The results of the numerical simulation indicate that about 63% from the respondents generally agreed with the simplification of the system especially when it involves the usage of the interactive application such as MOOC, YouTube, Wix.com, Instagram and Facebook as the learning medium.

The online applications that have been used make half of the respondents (51.5%) become more creative at every stage of business project planning. Furthermore, the result can be defined as considerably high especially on the question of cost-effectiveness since they no longer need to spend for printing costs which get around 79%. The implementation of this new system will help in promoting the paperless approach of green management practices got 65.4% of respondents agree with this statement.

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UMK014	VIRTUAL EVALUATION SYSTEM FOR INDUSTRIAL TRAINING (VESIT)

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Abstract: Good facilities from a university play an important role especially in creating better educational experience for both students and staff. Implementing smooth and efficient online facility enable the university to achieve the goals of having versatile environments and effective infrastructure. The VESIT system helps the student to experience better management of the industrial training. Through VESIT, it actually beneficial to the university as this system helps in eliminating many paper-needed situation and moves forward to the green management application. By embedding the web tools usage inside the system, it elevates the smoothness and satisfaction level for the user.

Keywords: *industrial training, online evaluation system, facilities management, occupants – feedback*

Introduction

Virtual Evaluation System for Industrial Training or VESIT is the upgraded version of previous project which is OPES (Online Practicum Evaluation System) which emphasizes on the usage of numerous online application and web tools 2.0 in evaluating the industrial training assessment. Traditional method consumed too much time and cost. By creating the OPES, we introduced a practical application that enable us to reduce thousands in term of documentation and supervising method. For VESIT, it elevate the value of OPES into a better managed system. Still using some web tools application like Padlet and some other video maker, VESIT cater for a wide database system for both students and faculty.

The VESIT system is easy to be managed, even by a person with less knowledge on ICT. This enables a fast and effective resolution especially when any type of problem arises. VESIT also enable the faculty to get fast response and legit information and request pertaining to industrial training. Any complaint or problem from the industry can be responded fast.

The main aim is to serve for a better management of database for industrial training. Practicing the green management system becomes a huge hit nowadays which make VESIT even more appeal compare to traditional way. VESIT have the potential especially in providing a continuous support for student to straightly start their career after the practical training without the need of coming back to university for final approach (presentation like the traditional way).

Traditional Versus Online Evaluation System of Industrial Training

Training evaluation is importance as it will determine the outcome from the training process itself. Goldstein (1986) described training evaluation as a systematic data collection on the success of training programs. The evaluation conducted basically to answer either of two questions; whether training objectives were achieved (learning issues), and whether accomplishment of those objectives results in enhanced performance on the job (transfer issues) (Kraiger, Ford & Salas, 1993).

Traditionally, the evaluation for industrial training was done by assessing the hardcopy forms, handwritten daily log book and final report as well as face to face presentation. These assessments are time consuming and required high cost to both faculty and the students where the faculty need to print out and provide the daily logbook for the trainees and the students need to print out their final report as well as spending money on the postage for submission purpose. Currently, online approach of evaluation system has been introduced to replace the traditional method. This online evaluation system is actually cost-effective and cheaper (Hair, Page, Money & Samuel, 2007; Nguyen, 2015) as compared to the traditional system. It is an effective tool to cater the rising cost of higher education by eliminating the printing as well as postage costs bear by both institution and students.

Besides that, this approach is easy to administer and can reach globally in fast speed (Sekaran, 2013). Unlike the traditional system, online evaluation system can easily access by the lecturers regardless their locations as long as they have the internet connection. The traditional system required the lecturers to stay at a specific place as they need to access the hard copy materials. Moreover, this system is user-friendly and easy to use which make it suitable to be used by any user and hence easier to administer. Furthermore, the online evaluation system is more time saving to both lecturers and students as the evaluation will be done through visual or video uploaded in the system. On the other hands, this online system helps in crafting the student creativity as they are allow to express themselves on the task given which can further boost their motivation and encourage their attention to details, and results in overall improved quality of work produced (Hamid, Waycott, Kurnia & Chang, 2015)

Other than that, online evaluation system becomes more appeal than the traditional system due to its paperless and going green element. It is an important element as sustainability concept has also become one of the main pillars in the latest 11th Malaysian Plan (2016-2020) where the Government will focus on pursuing green growth for sustainability and resilience.

Technology Acceptance Model (TAM)

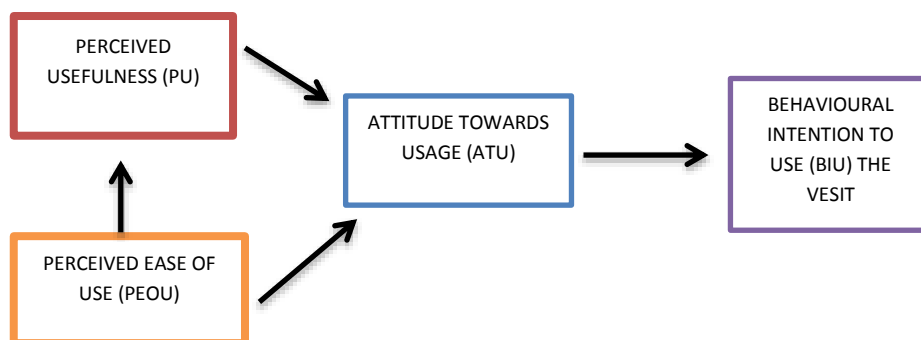


Diagram 1: Technology Acceptance Model (TAM) by Davis (1989)

There are many theories that have been developed to explain user's purpose and behaviour upon using information system technology. Among others, Technology Acceptance Model (Davis, 1989) has been

extensively studied in the literature. TAM originally proposed by Davis (1989) and it is an information service theory that model how users come to accept and use a specific technology (Dauda & Lee, 2015). Virtual Evaluation System for Industrial Training or VESIT implements TAM to determine the degree of acceptance of using this system during student's industrial training. It is crucial for researchers to understand the level of satisfaction among users, as improvement can be executed for future enhancement.

TAM has come across progression from time to time which able to account for 40 percent to 50 percent of user acceptance. TAM was actually extracted from the theory of reasoned action (TRA) by Ajzen and Fishbein (1980) which predicts user acceptance based on the influence of two factors: perceived usefulness and perceived ease of use which aims to explain the relationship between attitudes and behaviours within human action. Perceived usefulness is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance whereas Perceived Ease of Use (PEOU) is the degree to which a potential user views the use of target technology to be free of effort or easy. TAM model has been expanded by a number of researchers and has been applied to many different technologies including e-learning (Cheung & Vogel, 2013), teleconferencing (Park, Rhoads, Hou, & Lee, 2014), short message service (Muk & Chung, 2015) and others.

Impact of Technology on Performance Evaluation

Since the internet revolution, there has been a shift in the literature that focusses more on the impact of online activities: use of internet, use of educative online platforms, digital devices and use of blogs (Youssef and Dahmani, 2008). The literature on the impact of technology on students has shown mixed results. On one hand, some research demonstrates that there is no evidence of a key role for technology in higher education (Angrist and Lavy, 2002; Goolsbee and Guryan, 2002; Banerjee et al., 2004).

Over the past 15 years technology has increasingly been employed in the delivery of services. The adoption of technology into education industry is becoming a strong trend as service providers are now being urged by industry bodies to invest in technology. The role of technology in organizations as discussed by Kelley (1989) has been predominantly employed in the service sector, technology has been used to standardize services by reducing the employee or customer interface (Quinn, 1996). This is especially true when it comes to the course registration process and students assessment. While traditional assessment is a paper-based, labor-intensive process that wastes both time and money, assessment through online for universities is highly efficient and promises to revolutionize how administrators manage faculty operations.

On the other hand, some studies show a real impact of technology on students' achievement (Sosin et al., 2004; Fuchs and Woessmann, 2004; Coates et al., 2004). By using this technology it is easier to reduce expenses and increase efficiency at the same time. There are so many benefits of being able to maintain various services at low cost, reducing the number of people employed to manage the faculty and automating the entire operation of the university as well. When university has a good student information system in the faculty, it helps the students perform to their fullest potential. With the help of this technology, administration will be able to manage the student's database for industrial training accordingly. They will also be able to track the industrial training placement of the students. In fact, they can keep track of any other task that they may have allotted to the students as well.

Sosin et al. (2004) conducted a study in USA during 2002 and they found significant, but low, positive impact on student performance due to technology use. Nevertheless, they showed that some technology seems to be positively correlated to performance while others are not. Even, the relationship between the use of technology and performance in higher education is not clear, and there are contradictory results in the previous studies (Youssef and Dahmani, 2008). This emerging trend raises some important issues about the impact that technology will have on service quality and customer satisfaction levels. Furthermore, Cowels and Crosby (1990) have researched tolerance levels of consumers' preferences for using technology instead of the human touch. These systems are beneficial for the students and faculty as well as they are able to keep track their application process for industrial training placement. Once again, this is possible because these systems provide all the critical information on a single platform.

Dabholkar (1994) discusses how technology-based services have made new service delivery options available to organisations, making customer participation more widely possible. By using VESIT, clerks and classified workers no need to spend countless hours manually sorting, retrieving, entering and alphabetizing

data with traditional registration processes. In addition, this technology will avoid or prevent situation when students fail to bring in all of the individual forms that are required for registration, further time is wasted tracking down these forms. Dabholkar (1994) suggests there are a number of relevant classifications that will apply to industries employing technology based service delivery. In most of the cases, a student tracking system comes equipped with dashboards, which makes it easier management to track what work has already been done and by whom, and what work needs to be done and by whom. The best part of all this is that management get all the necessary information on a single screen, which helps students and management get the best possible view. This improves staff productivity much better and able to grow as an organization with very little effort. Switching to online assessment for industrial training and is a proven strategy for saving expenses compared to traditional way, paper-based assessment processes and printing costs. One of the foremost concerns of this era is conservation. With issues such as overpopulation and global warming, university have been increasingly trying to educate the next generation about environmental conservation.

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ID NO.: UMK 015

TOPIC: AMALGAMATION OF AUGMENTED REALITY WITH MOOC IN LEARNING BIODIVERSITY

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Abstract:

Learning Biodiversity through Massive Open Online Course (MOOC) has enables learners from around the world to participate in a large scale. The current Biodiversity MOOC that delivers content through conservative methods such as audio, recorded videos and lecture slides is assuredly insufficient to increase learners' engagement. Biodiversity is a natural science concerned with the study of flora and fauna. Anatomy of those living organisms is one of the main approaches in Biodiversity and requires learners to memorize load of information and contextualize the structure within their functions. Based on the conservative methods applied in Biodiversity MOOC, learners had difficulty in visualizing and applying knowledge practically. Hence, in order to sustain the learning process of Biodiversity through MOOC some enhancement is required. In this paper, it is proposed to incorporate Augmented Reality which helps create virtual objects when blended with real world. The Augmented Biodiversity Lab is aimed to amalgamate entertainment and study by providing immersive learning experience to learners. Through this Augmented Biodiversity Lab, several Augment Reality applications are used to enable the learners to explore and discover the intricate anatomical details of selected fauna and flora. The learners will virtually execute the dissection anatomy dissection. This also will assist them to recognize each different organ and understand the function of every organ. The expectation with this enhancement is to impart a great deal of knowledge and better learning outcomes for Biodiversity MOOC.

Key words: MOOC; Augmented Reality; Augmented Biodiversity Lab, Biodiversity

Content

Description of product development.

Massive Open Online Course (MOOC) can be easily accessed by numerous of learners from every part of the world via mobile device or desktop with an internet access. Previously, our mode of delivery for Biodiversity MOOC was quite conservative whereby incorporating lecture notes, quizzes, audio and static videos. Since Biodiversity is fact based subject and required the learners to memories several types of living entity, hence learning Biodiversity MOOC will be more effective and fun if the learners could experience the actual practical of dissection. In normal teaching classroom, students are exposed on actual dissection of living specimens. Henceforth to engage on immersive learning of Biodiversity MOOC, we are proposing to incorporate the augmented reality biodiversity lab. The augmented reality refers to a concept in which real world is enhanced by blending it with virtual world (Wu *et.al.*, 2013). Through this Augmented Biodiversity Lab, several Augment Reality applications are used to enable the learners to explore and discover the intricate anatomical details of selected fauna and flora. For the time being, the learners could virtually execute the dissections of frog and rat through two impressive virtual dissection applications from Funplay namely Froggipedia and Rat Dissection for ipad.

Background of product development.

The Biodiversity MOOC was developed by three subject matter experts in Biodiversity. This MOOC consists of 13 modules emphasizing on the diversity of flora, fauna, genetics and ecosystems. Each of the module was design

with an interesting animation lecture video, quizzes and notes. For the time being, two virtual lab applications were incorporated for Kingdom Animalia. This augmented biodiversity lab will enable the learners to interact with real and virtual objects.

The importance of Augmented Biodiversity Lab incorporated into Biodiversity MOOC in education.

Through this Augmented Biodiversity Lab, several Augment Reality applications are used to enable the learners to explore and discover the intricate anatomical details of selected fauna and flora. The learners will virtually execute the dissection anatomy dissection.

The figures below indicate the responses from 24 learners for Biodiversity MOOC. In Figure 1, 47.8% of learners rated the Biodiversity MOOC as an excellent, 34.8% as very good and followed by 17.4% as good. Meanwhile in Figure 2, indicated that the applications of virtual apps had increased the interest of the learners. About 54.2% of learners rated the applications as very good, followed by 25% rated as excellent and 20.8% rated as good.

The better visualization of the content keeps learners active during the learning process as it enhances human ability to understand and process information (Serio *et.al.*, 2013).

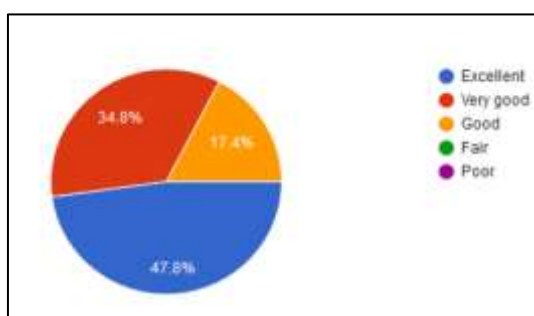


Figure 1: The percentage of overall rating for Biodiversity MOOC .

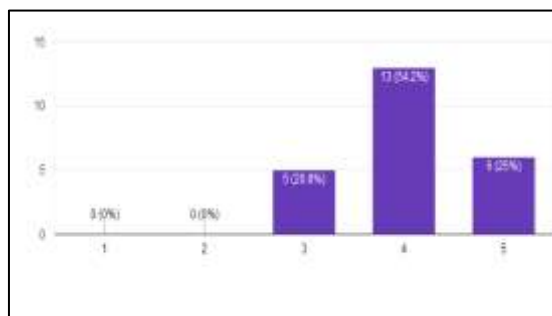


Figure 2: The percentage of the learners' interests on using virtual apps in Biodiversity MOOC.

Advantages of the product development towards education and community

Based on the conservative methods applied in Biodiversity MOOC, learners had difficulty in visualizing and applying knowledge practically. Hence, in order to sustain the learning process of Biodiversity through MOOC some enhancement is required. In this paper, it is proposed to incorporate Augmented Reality which helps create virtual objects when blended with real world. The Augmented Biodiversity Lab is aimed to amalgamate entertainment and study by providing immersive learning experience to learners. This will assist them to recognize each different organ and understand the function of every organ. The expectation with this enhancement is to impart a great deal of knowledge and better learning outcomes for Biodiversity MOOC.

Commercialization potential of the product.

- i. Private institution such as private colleges or pre-schools.
- ii. Personal usage for private tuition or personal teaching by parents at home.

Acknowledgement

We would like to thank you to Pusat Pembelajaran dan Pengajian Universiti Malaysia Kelantan, Fakulti of Earth Science and Faculty of Bioengineering and Technology for supporting our journey in promoting MOOC as part of teaching tool for Biodiversity globally.

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ID NO. UMP 001

TOPIC: Digital Grammar Board (DiGraB) For Students Learning Engagement

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Abstract: Digital Grammar Board or DiGraB is an innovation of the existing approaches used in teaching English language to students. In this newly and technologically advance approach, learning the language has been enhanced with the introduction of gamification elements. Students will be playing the board games that is equipped with Augmented Reality features using their own smartphone or tablet that can help to make the images, riddles or questions more vivid and real compared to a conventional board games. With the elements of gamification, students will learn better because of the characteristics of challenges, rewards and punishments that are believed to influence the learning process and to increase the sense of interest towards learning. By integrating the usage of technology in delivering the knowledge, both parties, the teachers and the students can gain many benefits especially in improving the teaching approaches and forming an easier construct of understanding the information.

Key words: Gamification, Board Game, Augmented Reality

Content

Students' engagement in a classroom context is very important especially involving younger students. This is because their attention span is very short and therefore require creativity and commitment of the lecturer to get them interested and stay focus in the learning process. One of the approaches that can be used is through gamification because younger generation likes challenges that can be achieved through game or in this sense, game based learning. King (2010) stated about teacher being the sage of the stage in a traditional classroom setting and that is no longer applicable in this modern world.

In answering this approach, Digital Grammar Board (DiGraB) was produced by taking into account the idea of snake and ladder board game. Students have built their own experience on how to play it and to make it more interesting, the element of Augmented Reality is introduced where at each designated boxes, there will be images that the students have to scan using their mobile phone or tablet in order for them to answer the questions and to allow them to move to the next boxes and win the game. This approach in teaching and learning is in line with information processing theory where the students are building their own knowledge by reformulating the information given to them and suiting it to their understanding and this is helping them in constructing extensive cognitive structures (Joyce, 1978). This invention used the ADDIE model as a framework in the development process as the analysis had been done on the aspect of students' attention in the learning process (Analysis), designing the board game using our expertise and experience (Design), developing the

board game based on the feedback received (Development), introducing the board game with Augmented Reality feature to the students in the classroom (Implementation) and finally we are in the process of evaluating the effectiveness of using this approach in the classroom as to enhance students' attention and engagement with the learning process (Evaluation). All of these processes require a rigorous work from all of the team members especially in planning, designing the Augmented Reality and testing it on the board game.

Introducing gamification in classroom can be considered as a nudging process because this intervention can be a catalyst for a bigger positive effect. This is what mentioned by Huang and Soman (2013) in their research report entitled "A Practitioner's Guide To Gamification Of Education" where the idea of instilling the element of gamification in teaching and learning context can help to engage the students more into developing their interest in learning. Other than motivating students to learn, the teachers are also responsible in ensuring that the students are really participative in the classroom and this can be done by having activities that really involve them besides using current technology in the classroom such as gamification.

The basic idea used in inventing this product was initially on Parts of Speech but after we received a suggestion from another person outside of the research team, we changed the whole notion to grammatical aspects as it covers a broader issue and tactful in a sense. In developing this invention, the fundamental approach was to integrate the element of gamification with technology usage. Gamification in general is putting the game element in teaching and learning processes especially on challenges, punishment and reward so that the students will be more attracted to the learning environment and being competitive to achieve the aim of learning. By having Augmented Reality feature combined with the board game, students will be excited to use their gadget to scan the images and answer the questions correctly so that they can always lead the game and finally winning it.

This whole approach is very important to tackle students' attention in the classroom besides introducing a new method of doing exercises for them after they have learned about that particular topic. Before this, students listened to lecture and after that, they have to go to their textbook or exercise book to do the exercises related to what they have just learned. With this invention, the method will be different as instead of using books, they are allowed to use their own smartphone or tablet to do the exercises. In addition to this, students can learn better because they are allowed to discuss further about the questions (peeragogy) besides getting them to get used with collaborative learning as in certain point, students learn better with their peers.

In a detail aspect, gamification elements are used to trigger the sense of participatory culture and collaborative learning (Beer, 2016). This is relevant because teaching and learning is a two-way communication and it cannot be conducted through a single performer. By having this element embedded in the teaching and learning environment, students are expected to be more energetic and interested by paying full attention to the knowledge delivery by the teachers who at the same time can measure the responsiveness of the learners in the classroom.

In terms of a bigger audiences, this invention can help teachers to create an interesting yet meaningful learning activities in the classroom according to their creativity and needs. As when the students are getting more interested in the learning process, they can master it better and thus help them in grasping a better understanding of the subject matter. This will lead to a mass production of a great graduates who are able to compete in various levels by having different set of skills especially those related to the advancement of technology.

This product has been an interest to several parties and institutions in relation to commercializing it for a mass usage particularly for schools and higher learning institutions. The team however is still in the process of negotiating the opportunity so that everyone will benefit the most from it.

Acknowledgement

We are grateful for the opportunity given in inventing this product. Thank you very much to Allah S.W.T for His blessings and guidance. Thank you as well to all the team members for their continuous supports and motivation for this product to be produced and showcased in such a great exhibition and lastly, thank you to other individuals who are directly or indirectly involved with this invention.



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ID NO. UMP 002	TOPIC: ePAL Apps : Enhancing Parenting Literacy in a Smart Society 5.0

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Abstract:

Society 5.0 represents strategic planning for super smart society that represents technology, human and values into sustainable socio-economic life of the world. In 2017, the Malaysian National Family Planning and Population Board, celebrated the theme "Families, Education and Wellbeing" as a reminder of the role of education to unlock the full potential of children and their wellbeing. Therefore, the aim of this research is to develop a mobile application for parents to guide their children based on the children's personality types towards career path, strength and parent-child relationship. Thus, the parenting guide is proposed to help parents to educate their children by knowing their parent-child's personality based on four personality types namely Commander, Organizer, Diplomat and Entertainer. The research is beneficial to society in promoting parenting skills in a smart society 5.0 that can enhancing parenting literacies. Furthermore, this research is related with interactive learning and decision support system for establishing the relationship between parents and children. To make it easier for parents, mobile application are introduced in line with this increasingly advanced technology world. The objectives of this research are to study about the types of human, to apply the solution to improve the relationship between parent and child by using technology and to develop a mobile application that can guide parent to polish the strength of their kids. In order to get the best result, Case-Based Reasoning (CBR) technique and mobile application development life cycle had been conducted. CBR is artificial intelligent (AI) techniques that try to model or imitate human reasoning (decision making) and thinking. The lifecycle of mobile development is largely no different than the Software Development Life Cycle (SDLC) for web or desktop applications that easier for new and experienced application developers.

Key words: *mobile apps, society 5.0, parenting, literacy, personality*

Content

Description of your innovation / product development / design / process.

The processes to produce mobile application of parenting guide can be seen as a reflection of a particular type of human reasoning. In many situations, the problems that humans encounter are solved with a human equivalent of case-based reasoning. When a person encounters a new situation or problem, he or she will often refer to the past experience of a similar problem to find a solution. In a similar process, this mobile application involves basic reasoning from previous experiences by retaining solutions of new problems (Romli, et.al, 2015).

The process shown in Figure 1 starts with an input features of a problem, which defines a new case without solutions. This particular new case is based on the answers from questionnaires that had been calculating the similarities, for the features of input. These features are also used to retrieve cases from the case based library by searching the similar cases. In term of parenting guide as part of the solution, the information will be assessed by using the most similar case. At this stage, the users have two options. If they are not satisfied with the solutions, they can modify the feature values and run the process again in order to improve the solutions. Otherwise, if they are satisfied with the solutions, the case will be retained, and the library to be updated by storing a new learned case. Consequently, this process will increase the cases in the library that can be accessed in future, subsequently re-using solutions for the next new case.

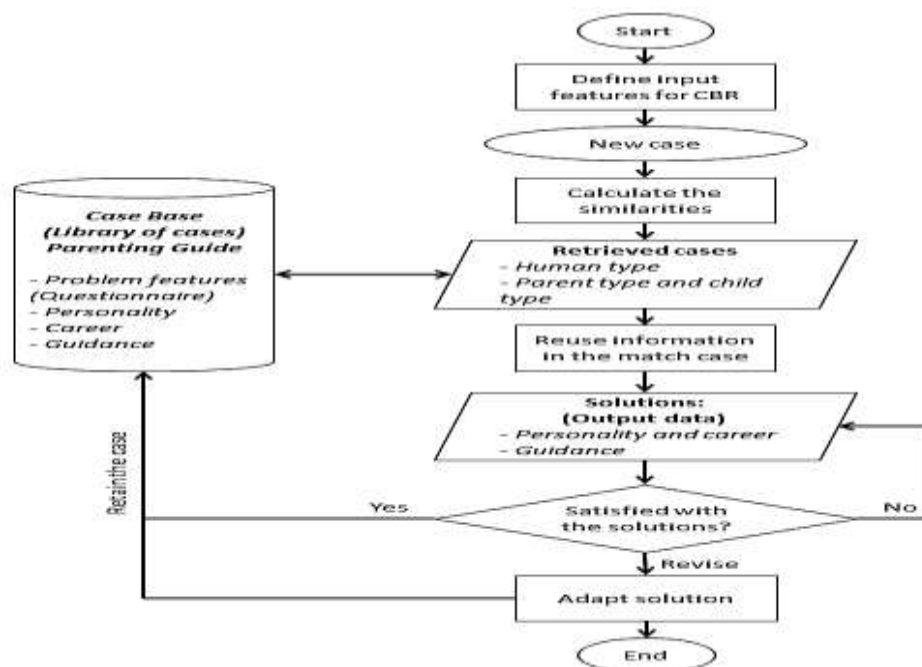


Figure 1 The process of Case-Based Reasoning (Fatinatul, 2018)

What is the context or background of the innovation / product development / design / process?

Mobile Application Development Life Cycle analysis has been embedded in the development of ePAL apps in order to support parenting guide. The development of mobile application as the methodology and

prototype of this study consists of five phases, which are inception phase, design phase, development phase, testing phase and deployment phase (Xamarin, 2018).

In inception process, the preliminary studies were conducted in order to identify society problems, objectives and scope of this apps. In addition, the literature review was undergo in this phase to identify the main concepts, techniques, methods, methodologies and the variables for this study.

During design process, the technique, the essential component (hardware and software) details used, processing and procedures for the apps to accomplish its objectives was performed to define how the application will be written.

Besides, development phase is focuses on the modules used in parenting guide, the technique applied in mobile application which is CBR, and hardware and software used for the system mobile development. This phase is conducted based on the collected data from literature review and also from the result of pilot study. For this research, it is focus on the combination of three categories which are personality, guidance and career. In CBR technique, this section shows the procedures and processes for analyse the collected data using CBR technique. The process flow is beginning with the study about the parenting guide. Then, the next step is identifying problem on the parent-child relationship by collecting data based on the correct parenting guide that is suitable and appropriate to both parent and child. Based on the data collected, proceed to the next step, which is developing the mobile application. After that, the test is conducting either the application is achieve the objectives or not.

The purpose of testing process is to determine if the proposed design meets the initial set of business goals. Testing may be repeated, specifically to check for errors, bugs and interoperability. This testing was performed until the end user finds it acceptable. Another part of this phase is verification and validation, both of which will help ensure the programs successful completion.

The deployment phase is the final phase of the mobile development life cycle and puts the product into production. After the project team tests the product and the product passes each testing phase, the product is ready to go live. This means that the product is ready to be used in a real environment by all end users of the product.

Why are they important to education?

ePAL is focuses on parent and child. Child is the person who needs to educate with the correct way. A child wants to have a warm and loving connection with each of their parents, and being able to communicate well with each other can help make that happen. Sometimes, it is hard for a child to want to open up to their parent. By knowing their child's type, parent can build the strong relationship with their child. Parenting can be more enjoyable when positive parent – child relationship is established. Children thrive on positive attention. Children need to feel loved and appreciated. Most parents find that it is easier to provide negative feedback rather than positive feedback. By selecting and using some of the solution on a daily basis with child, parent will find that their child will start paying more attention and will try harder to please.

Please write any advantages of your innovation / product development / design / process towards education and community.

- Enhance parenting competencies
- Effective interactive learning system
- Improve parent-child relationship
- Promote parenting skills in a smart society 5.0

Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

Commercial value can be benefited to other sectors as follows:

- Education: School, University. (Educators and Students)
- Workplace (Employers and Employees)
- Psychologists, career counselors, and other professionals that conduct personality assessment

Acknowledgement

We are grateful to the Centre for Academic Innovation & Competitiveness (CAIC) and Research & Innovation Department for the research grant (RDU1603143) supporting our research works in this project.

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ID NO. UMP 003

**TOPIC: LEARNING SPACE QUALITY MONITORING :
SENSING THE UNSEEN FACTOR**

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Abstract: Providing the best infrastructure for learning in university is the most important job. Administrator tends to look after the physical infrastructure rather than unseen matters. Recently, no device or scheme available to detect and prevent with monitoring the learning space quality. 150 students from multiple courses had participated in the learning investigations. The sites for investigations are the lecture hall, computer laboratory, and library. In the same investigations, we activate the HeDoo devices which detecting air particles which theoretically affect the quality of learning. Even though the site looks cozy and breathable, it showed students have a problem, especially in knowledge understanding, memorizing, and focusing. The three unseen major factors influencing the learning quality are humidity (95%), temperature (93%), and carbon dioxide (92%). This finding is beneficial to educational infrastructure planning and may provide a good outcome on students' performance. Further analysis will be run especially on minor factors.

Key words: *learning quality, learning infrastructure, indoor air quality, internet of things, sensors*

Introduction

World of education enormously changes from face to face method to online learning (self-paced). Even the method evolved through time, instructor or teacher still can't solve behavioral of students (Ridza, 2017). They tend to act anonymously and don't reflect towards the learning context. This situation worsens as the online learning introduced in early 2000. The instructor can't reflect on real-time (Divine, 2018), resulting in a failure in understanding of knowledge (Murdoch-Kinch, 2017).

On the other hand, the infrastructure of education advances faster. From chalk and talk to self-paced online learning. Students are tending to complete the online learning session in designated place, such as library and residential college (Sanusi, 2017). However, based on these research findings using a cross-sectional study (Rehman et. al., 2017), the student's facing a problem on focusing on the subjects. More than 60% of students feel sleepy while studying, and more than 75% didn't understand what they're studying.

This innovation tries to cater the unseen factors by evaluating and analyzing the environmental particles and deduce what should be done by administrator and instructor.

Objectives

We have identified several objectives in conducting the study.

- i. To seek relevancy between unseen factors and learning quality

Based on the questionnaire given to learners and the automated environmental detector particle, we analyze the coefficient between these two criteria.

- ii. To determine the wellness factors in learning space

This is based on Cornell Learning Space Guidelines which cater to which factors will be cover by SBS questionnaire to determine the quality of learning space.

- iii. To evaluate the solutions using questionnaire and real-time environmental data analysis

After all, factors are determined through analysis, the outcome of the innovation translated into usable learning space quality advisor

Innovation Process

Distribution of questionnaire distributes to the students' sample to various learning spaces. These works are to make sure common e-learning (self-paced study) are covered. Students are needed to answer four sets of questionnaire: - before and after learning in normal and adjustment environment.

After all the questionnaire had been analysed we will have a set of rules, which could assist the system to determine the best environment for study. These rules are an active guideline which is the administrator could monitor over time.

Lastly, a monitoring system developed, interfacing the rules and guidelines with the end user.

Result

The investigation had shown, three major factors: humidity (95%), temperature (93%), and carbon dioxide (92%) affect heavily on learning quality. These factors should be monitor frequently to make sure the quality of learning at a high pace.

In the other hands, the method on environment quality shows a fruitful result. We have developed an interface to make sure it is easy for learning space manager to monitor.

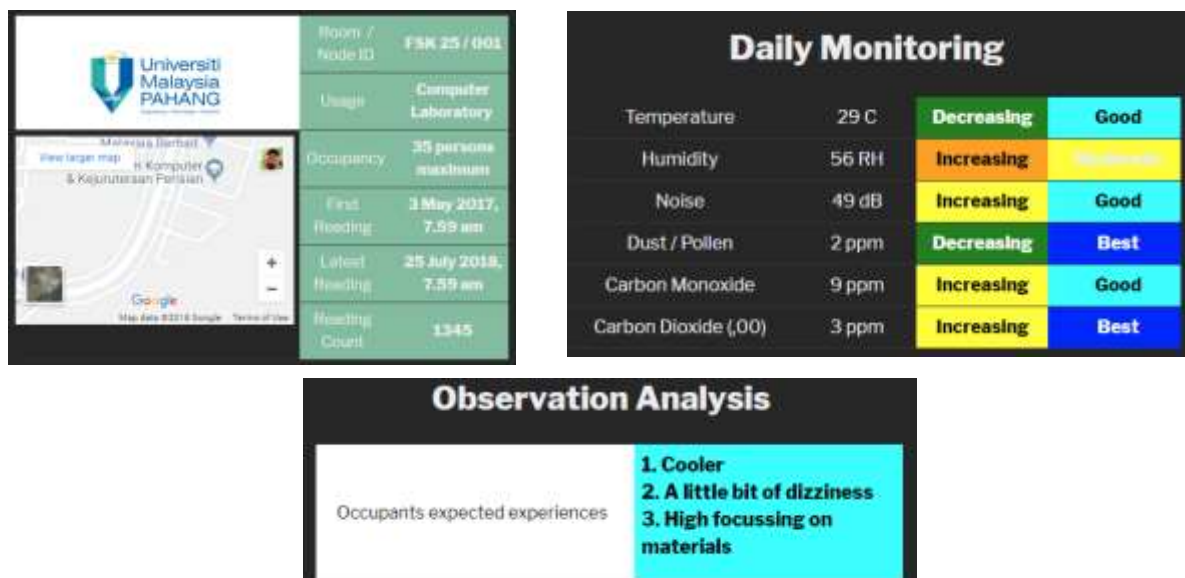


Figure 1 : User Interface for Learning Space Monitoring

After we gather all the data, the comparison between learning perception and acceptance are analyzed. The result in **Figure 2** shows, four major learning perception affect directly with the learning environment.



Figure 2 : Investigation Result

Conclusions

We have found the problem arises between the learning space environment and its relation with quality of learning. The result showed this assessment could help the educational institution upgrading their learning space to be a better place. This innovation also applicable to all country with a similar climate to Malaysia. Recently, Indonesia university had shown a good intent to implement this innovation.

Acknowledgement

We would like to thank the students who participated as software testers and volunteer participating this innovation. Also to CIREL UMP for sponsorship of our participation in the exhibition.

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ID NO. UMP 004
Smart OBE Academic Planner (SOBEAP): A Novel Approach for Integrating Self-Efficacy Among Student in Higher Education
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Abstract:

In Malaysia, Outcomes Based Education (OBE) is translated through the implementation of Malaysia Qualification Framework (MQF) which is a legal requirement (Malaysian Qualifications Agency Act 2007) for higher education institution in securing program accreditation. However, there are challenges in OBE implementation which it is still at nurturing stage among educators while among student, it might be still at infancy stage and took some time to be established and culturized. With Industry Revolution 4.0 (IR4), universities are demanded to adopt new way of how academic matters been managed, operated and rapidly improvised with targeted opportunities and calculated risks. One of the potential technologies in IR4 to deal with such issues is by using digital technology like software based visual analytics approach. This technology can assist student to manage their academic performance through data driven decision-making approach which strongly impact student's self-efficacy level. Our study aims to develop a technology called Smart OBE Academic Planner (SOBEAP) to instill self-efficacy while internalizing OBE among student. This technology adopts visual digital analytics approach with decision modeling based on MQF. Key outcomes from this study produced specific decision models for student to manage their academic performance by adopting self-efficacy skills through SOBEAP. It capable to analyze the effectiveness of student's study strategies while producing insights (opportunity and risk) for student to manage their future academic performance.

Key words: *OBE, engagement, self-efficacy*
Background

Outcomes Based Education (OBE) is an educational philosophy where teaching and learning approach including assessment that is oriented to the predetermined set of expected outcomes. The outcomes in this context is referring to a set of values or attributes on what the learner or student should acquire upon completion of certain level of learning process. In other words, OBE focuses on what student will achieved at the end to meet the aim of the academic program why it's been created at the first place. In Malaysia, OBE implementation is embedded through the implementation of Malaysia Qualification Framework (MQF). MQF enforcement is governed by Malaysia Qualification Agency (MQA) through the Act of Parliament (Act 679). Now it has been revised and MQA has released the MQF 2.0 which will come to enforcement starting on 2019 (Mohamed, 2018). This means, OBE implementation in Malaysia has been designed in a systemic manner as a legal requirement which means, no one should left behind in adopting OBE in Malaysia higher education.

Adopting OBE or MQF requires a paradigm shift (Chabeli, 2006; Malan, 2000) of the student, educator and administrator themselves which demand the stakeholders to be strategic (William G. Spady & Marshall, 1991). Many claims (Jean & Karen, 1991; Kaliannan & Chandran, 2012; Mamat, Rasul, & Mustapha, 2014; Rasha & Nisha, 2013) that OBE offers many advantages and provide an avenue for transformative education system especially on democratizing education. However, there are also critics, issues and challenges (Rajaei, Junaidi,

Taib, Salleh, & Munot, 2013; W.G. Spady, 1994; Zahorchak, 1994) reported on OBE implementation. It's implementation still at nurturing stage among educators while among student, it might be still at infancy stage and took some time to be established and culturized. Recent research study(Kumpas-Lenk, Eisenschmidt, & Veispak, 2018) discover how disconnectivity of student's learning with the learning outcomes resulting students are likely to lose interest in being responsible for their learning and causing them to participate passively to meet only minimum requirements of the degree programmes.

With Industrial Revolution 4.0 (IR4) impacting the whole industry globally, meeting minimum requirements for graduation and lack of self-efficacy most likely may not securing student to well prepare with the changing landscape of the industry and the skills sets(Arntz, Gregory, & Zierahn, 2017; Eberhard et al., 2017; World Economic Forum, 2016). Not only it impacting the graduates, it also demands universities(Azim, Subki, & Yusof, 2018; Baygin, Yetis, Karakose, & Akin, 2016; Thai, Thi, & Anh, 2017) to design, experiment and adopt unconventional way of how academic matters been managed, operated and rapidly improvised with targeted opportunities and calculated risks. One of the technology highlighted in IR4 is the use of digital analytics. One of the common approach in digital analytics is data visualization or visual analytics. Visual analytics capable to assist people to reason based on the pre-determine analytical model or analysis for decision making. This approach has high potential to promote self-efficacy skills among student by reasoning or self-reflect on their learning performance. Self-reflect or reflection is very powerful thinking skills to improvise learning and builds student's confidence in the ability to achieve goal or known as self-efficacy(Di Stefano, Gino, Pisano, & Staats, 2014). Many research studies(Chemers, Hu, & Garcia, 2001; Collinson, 1988; Joo, Bong, & Choi, 2000; Krumrei-Mancuso, Newton, Kim, & Wilcox, 2013; KUH, 2006; Pintrich & De Groot, 1990; Schunk, 1990; Vuong, Brown-Welty, & Tracz, 2010; Yukselturk & Bulut, 2007; Zajacova, Lynch, & Espenshade, 2005) found that self-efficacy is very important for student success.

Since OBE implementation demand stakeholder to be more strategic and there is lack of research emphasize on using digital tools for student to strategic engage with OBE implementation, our study aims to develop a prototype digital tool to facilitate student engagement in OBE implementation utilizing visual analytics concept in academic planning.

Innovation Description

Smart OBE academic planner is a digital tool developed in spreadsheet for student to manage their course planning and learning outcomes performance. The smart feature embeds auto-calculation with pre-determine analysis model of student learning performance. It also incorporates feature where student need to perform reflection on their performance, action plan and status of the plan. To better sense of belonging of OBE adoption among student, we called this tool as myOBE.

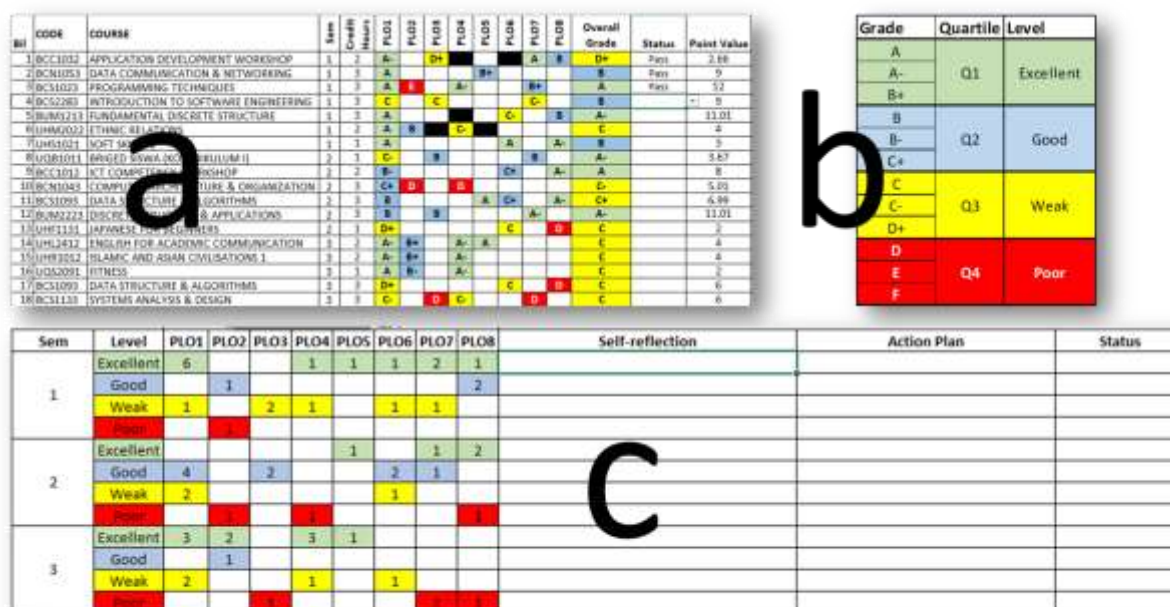


Figure 1 : myOBE - Smart OBE Academic Planner

The steps how to use myOBE as illustrated in Table 1.

Table 1: myOBE functionalities and Smart Features

Step	Description	Smart Feature
Step 1	Student enter course information (course code and name) based on curriculum structure of their academic program.	Automatic extraction the credit hours based on the course code.
Step 2	Student enter the grade attainment of course learning performance according to the designated learning outcomes (Figure 1 (a))	Automatic cluster the grades with colour mapping based on reference colours in Figure 1 (b). The grades performance clustered into four quartiles Q1, Q2, Q3 and Q4.
Step 3	Student view the analysis in Figure 1 (c) where frequency of grade performance based on grade cluster.	Automatic quantify the frequency of grade according to grade cluster, semester and learning outcomes with colour mapping.
Step 4	Student enter self-reflection text.	System keep the records for future reference.
Step 5	Student enter action plan and status based on self-reflection.	System keep the records for future reference.

Significance of myOBE for Education

1. Planning is very important meta-cognitive skills in education for student (Chuvgunova & Kostromina, 2016). myOBE assist students to plan their course registration with data driven decision making by considering their learning performance.

2. Self-efficacy skills is very important for student success (Alegre, 2014). myOBE assist students to recognize their strength and weaknesses in study with visualization.
3. Data analytics is one of important component in IR4 (Campbell, DeBlois, & Oblinger, 2007). myOBE equip student or getting student familiarize with academic analytics in their study and help them to meet future career needs.
4. OBE and MQF adoption require student engagement (Trowler, 2010) since students are the primary stakeholder. myOBE facilitate student to fully aware, engage and develop planning strategy to achieve the goal or the learning outcomes of their study.
5. Academic advising program can be done in more effective way with analytics (Dahlstrom, 2016). myOBE can facilitate academic advisor to advise student accordingly based on the visual analytics.
6. Digital transformation is a must in education (Rovai & Downey, 2010). myOBE facilitate institution to embrace digital transformation through digital technology adoption in core business (academic). myOBE can be embedded in existing Learning Management System (LMS) or uploaded in other online system.
7. Self-reflection is very important for student to make sense and realize the meaningful learning experience (Bugg & Dewey, 1934). myOBE assist students to document or record their reflection based on the analysis of their learning outcome performance.
8. myOBE has potential impact on minimizing attrition rate in education by empowering student with data driven decision making, reflection (thinking skills) and self-efficacy skills (Peterson-Graziose, Bryer, & Nikolaidou, 2013).
9. myOBE has potential impact on graduate employability (Rahmat, Ahmad, Idris, & Zainal, 2012) and institution to optimize their resources in producing human capital for the industry needs and meeting the purpose of education.

Advantages of myOBE

1. myOBE is been developed with common spreadsheet application which is Microsoft Excel. Excel has widely been used globally and is free for student in Malaysia public universities to use through Office 365 subscription program.
2. myOBE is a software based in nature. Thus, it does not require paper usage which promote paperless environment in campus. It can be shared through Internet and hosted on the cloud platform for global accessibility by community of educator.
3. Automatic features in myOBE save time for students to make strategic decision of action plan on their learning outcome performance. All calculations are made through Excel formula and no script or macro been used in myOBE which avoiding the risk of malicious code through Excel macro.
4. Promote United Nation Sustainable Development Goal through increase the quality of education by minimizing attrition rate or eliminating the risk of student's drop out.
5. Promote United Nation Sustainable Development Goal through decent works and economic growth by equipping student with visual analytics.

Commercial viability of myOBE

1. myOBE can be customized to meet any curriculum for academic institutions through license subscriptions. myOBE has been registered with myIPO under copyright with file number LY2017000704.
2. myOBE license can be subscribed as personal license with RM10.00 per student or campus license with RM1.00 per student.

Acknowledgement

We are grateful to Centre for Academic Innovation & Competitiveness (CAIC) and Research & Innovation Department for the research grant (RDU170317) supporting our research works in this project. Special thanks to Centre of Instructional Resources and e-Learning (CIReL) for the sponsorship for us to participate in IUCEL 2018.

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ID NO. UMP 005
TOPIC: HAYAA NADRUS BAHASA MELAYU

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Abstrak: Hayaa Nadrus Bahasa Melayu bermaksud Jom Belajar Bahasa Melayu merupakan satu bentuk inovasi yang dilakukan terhadap kaedah pengajaran dan pembelajaran bahasa Melayu terhadap pelajar antarabangsa dari negara Yemen. Walaupun kursus bahasa Melayu merupakan kursus yang diwajibkan kepada semua pelajar antarabangsa namun minat dan keinginan untuk menguasai bahasa ini sangatlah tidak memberangsangkan. Hal ini demikian kerana, suasana persekitaran mereka di negara ini tidak memerlukan mereka perlu untuk menguasai bahasa Melayu malah mereka dapat menjalankan semua urusan mereka menggunakan bahasa Inggeris. Oleh yang demikian, pendekatan Hayaa Nadrus menggunakan dialek Yemen sebagai kata kunci tarikan dilihat sebagai pendekatan yang membantu merangsang mereka untuk belajar dan menguasai bahasa Melayu. Pendekatan ini dilakukan dengan dua kaedah perlaksanaan, (i) kaedah peeragogi yang melibatkan lima komponen iaitu, fasl dirasi (kelas), nasyat (aktiviti), taqyim alzumala (penilaian rakan sekelas), makan haqiqi (lokasi sebenar) dan thaqafa (budaya) dan (ii) kaedah e-learning menggunakan platform Kalam, Facebook, Laman Sesawang, Video dan Kod QR. Penggunaan kaedah e-learning sebagai alat bantu mengajar dengan mengaplikasikan elemen teknologi yang dapat dimanfaatkan oleh semua pelajar dengan mudah selaras dengan usaha memasyarakatkan teknologi. Manakala kaedah pembelajaran kaedah peeragogi dengan penggunaan kata kunci dialek Yemen sebagai aspek daya tarikan kepada pelajar untuk mempelajari dan menguasai Bahasa Melayu. Hal ini demikian kerana kedua-dua strategi ini mewujudkan suasana pengajaran dan pembelajaran yang lebih menarik, berfokus, autentik dan berasaskan pengalaman sebenar. Selain itu, para pelajar juga dapat mengaplikasikan pelbagai elemen teknologi dalam proses pemerolehan, penguasaan dan komunikasi bahasa dan budaya Melayu. Akhirnya, para pelajar ini akan dinilai dengan ujian yang telah ditetapkan, iaitu ujian mendengar, membaca, menulis dan bercakap untuk mengetahui tahap penguasaan mereka menggunakan bahasa Melayu.

Kata Kunci: pengajaran dan pembelajaran, bahasa Melayu, pelajar antarabangsa, dialek, peeragogi, teknologi

1) Perincian Inovasi

Hayaa Nadrus Bahasa Melayu (Jom Belajar Bahasa Melayu) merupakan satu bentuk inovasi penggunaan dialek dalam proses pengajaran dan pembelajaran kepada bukan penutur asal bahasa Melayu khususnya pelajar dari negara Yemen. Para pelajar yang terlibat ialah seramai 60 orang pelajar dari negara Yemen yang mengikuti kursus Bahasa Melayu Malay For Beginners (UHF1161) semester 1 dan semester 2 2017/2018 di Universiti Malaysia Pahang. Kaedah pelaksanaan inovasi penggunaan dialek ini melibatkan dua kaedah, iaitu (i) kaedah peeragogi yang melibatkan lima komponen iaitu, fasl dirasi (kelas), nasyat (aktiviti), taqyim alzumala (penilaian rakan sekelas), makan haqiqi (lokasi sebenar) dan thaqafa (budaya) dan (ii) kaedah e-learning menggunakan platform Kalam, Facebook, Laman Sesawang, Video dan Kod QR. Selepas mengikuti kelas bahasa Melayu yang mengaplikasikan kedua-dua strategi ini pelajar seterusnya dikehendaki untuk menduduki empat ujian

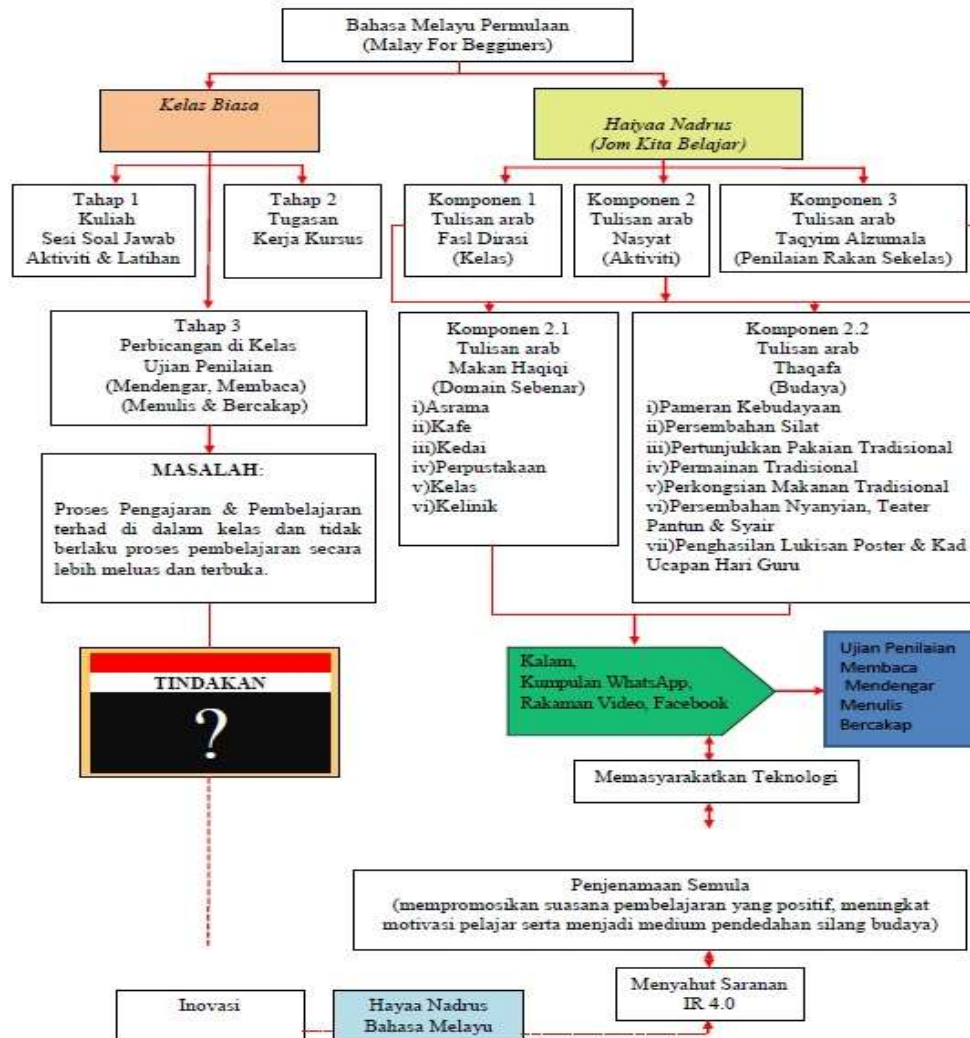


pemilaian, iaitu ujian bercakap, menulis, membaca dan menulis untuk mengukur tahap penguasaan dan kecekapan mereka menggunakan bahasa Melayu.

2) Latar Belakang & Carta Alir Proses

Di Malaysia pelajar antarabangsa diwajibkan mempelajari bahasa Melayu sebagai syarat untuk bergraduasi. Namun begitu para pelajar ini tidak berminat dan bermotivasi untuk mempelajari dan menguasai bahasa ini. Hal ini demikian kerana suasana persekitaran tidak memerlukan mereka untuk menggunakan bahasa Melayu dan mereka dapat meneruskan kelangsungan hidup mereka atau melakukan sebarang aktiviti dan berinteraksi dengan menggunakan bahasa Inggeris di negara ini. Keperluan bahasa Melayu yang tidak dominan menyebabkan mereka tidak berminat bukan sahaja untuk mempelajarinya malah untuk tidak menggunakan bahasa ini. Lantaran itu, inovasi ini dilakukan untuk mencapai beberapa objektif. Objektif inovasi ini ialah untuk memperkenalkan kaedah pengajaran dan pembelajaran yang lebih menarik dan menyeronokkan dengan penjenamaan semula (redesign), memotivasikan pelajar antarabangsa khususnya pelajar dari negara Yemen untuk mempelajari dan menguasai bahasa Melayu untuk berkomunikasi dan seterusnya memasyarakatkan teknologi dalam proses pengajaran dan pembelajaran bahasa Melayu selaras dengan cabaran dan keperluan revolusi industri 4.0 (I.R 4.0). Carta alir proses pelaksanaan inovasi dilakukan seperti jadual dibawah:

Carta Alir Proses Pengajaran & Pembelajaran Hayaa Nadrus Bahasa Melayu (HYN-BM)



Carta Alir Proses Pengajaran & Pembelajaran Hayaa Nadrus Bahasa Melayu (HYN-BM) 2018,

3) Kepentingan Inovasi Untuk Proses Pengajaran & Pembelajaran

Kepentingan inovasi ini adalah selaras dengan hasrat untuk memartabatkan dan mempopularkan penggunaan bahasa Melayu dalam kalangan pelajar antarabangsa. Selain itu, inovasi ini penting untuk mengubah persepsi pelajar antarabangsa terhadap proses pengajaran dan pembelajaran bahasa Melayu. Hal ini demikian kerana selama ini bahasa Melayu dianggap tidak diperlukan kerana tiada kepentingan dalam kehidupan mereka walaupun berada di Malaysia. Kepentingan seterusnya adalah untuk memberikan pendedahan aspek budaya Melayu kepada para pelajar ini dan bagaimana bahasa Melayu memainkan peranan sebagai bahasa perpaduan dalam kalangan masyarakat yang berbilang kaum di negara ini.

4) Kelebihan Inovasi

Inovasi ini mempunyai beberapa kelebihan, iaitu seperti berikut (i) dapat diakses bila-bila masa dan dimana sahaja (global akses) (ii) mempromosikan kaedah pengajaran dan pembelajaran yang lebih menarik dan

menyeronokkan (iii) mempertingkatkan keyakinan dan kebolehan para pelajar untuk menggunakan bahasa Melayu dalam komunikasi mereka (iv) pembelajaran berasaskan “hand on” dan “authentic learning” serta penggunaan bahasa secara terus di lapangan sebenar dan (v) memberikan pendedahan kebudayaan Melayu di Malaysia kepada para pelajar.

5) Potensi Pengkomersialan

Terdapat beberapa potensi pengkomersialan untuk inovasi ini, iaitu:

- i) Modul Pembelajaran Bahasa Melayu dan Kursus Jangka Pendek kepada para pelajar antarabangsa di semua peringkat pendidikan dan para ekspeteriat di negara ini.
- ii) Hak Cipta yang dipatenkan, iaitu bernombor rujukan LY2018002466
- iii) Penerbitan melibatkan modul komunikasi Bahasa Melayu, kertas kajian, jurnal dan bab dalam buku.
- iv) Penganugerahan yang diperolehi sebanyak dua pingat emas di National Innovation & Invention Competition Through Exhibition (iCompEx 2018) dan Creative & Innovative Teaching and Learning of Language (Cintell 2018) serta pingat perak di International University Carnival On E-Learning (IUCEL 2017).
- v) Kerjasama dilakukan dengan pelbagai bentuk aktiviti dengan Dewan Bahasa dan Pustaka, Persatuan Pelajar Yemen dan Sudan, dan Sekolah Kluster Kebitaraan Bahasa Melayu di negeri Pahang.
- vi) Geran penyelidikan berkaitan geran pelancongan (ahli) dan geran pengajaran dan pembelajaran Bahasa Melayu (dalam proses permohonan).

Penghargaan

Inovasi ini mendapat pembiayaan daripada Centre of Instruction Resources & E-Learning (Cirel) Universiti Malaysia Pahang untuk menyertai Pertandingan IIDE di International University Carnival On E-Learning 2018 di Universiti Islam Malaysia Antarabangsa.

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ID NO. UMP 006

TOPIC: FLIPPING BAHASA JEPUN

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Abstrak: Proses pemerolehan bahasa Jepun adalah didorong dengan unsur budaya serta minat yang mendalam, dalam pembelajaran dan budaya yang terdapat di masyarakat penutur asal sangat signifikan memainkan peranan yang penting dalam pengkodan makna yang ingin di sampaikan. Kekangan yang terjadi adalah tiada persekitaran Jepun untuk memungkinkan proses pembelajaran berlaku. Sehubungan dengan itu, penerapan suasana pembelajaran di dalam kelas dan pembiasaan budaya di lihat signifikan untuk para pelajar di Universiti Malaysia Pahang (UMP) yang mengambil subjek Bahasa Jepun sebagai satu subjek elektif. Penggunaan buku dan CD Audio Visual "RINA JAP Let's Practice Japanese!" serta KALAM digabungkan secara Flipped-Classroom dilihat mampu membantu pelajar mendapatkan suasana Jepun dalam pembelajaran secara aktif di samping dapat mengatasi masalah kekurangan waktu pertemuan bersemuka antara pensyarah dengan pelajar. Pelajar diminta bersedia sebelum kelas bermula dengan meneliti video dan bahan yang disediakan melalui platform KALAM dan buku rujukan terlebih dahulu. Manakala di dalam kelas pula pembelajaran aktif berpusatkan pelajar seperti perbincangan dan soal jawab dengan rakan yang lain dan pensyarah hanya memberi penerangan yang sedikit. Setelah penelitian dilakukan didapati peningkatan penguasaan yang lebih baik dikalangan pelajar. Ini dibuktikan dari keputusan peperiksaan akhir tahun pelajar yang lebih baik dalam 14 minggu pengajaran dan pembelajaran dilakukan.

Kata kunci: Pengajaran dan Pembelajaran (PdP), Bahasa Jepun, pelajar UMP, CD Audio Visual "RINA JAP Let's Practice Japanese!", KALAM.

Kandungan

Inovasi *Flipping* Bahasa Jepun merupakan reka bentuk pengajaran yang menerapkan elemen 3S iaitu sebelum, semasa dan selepas untuk diaplikasikan dalam Pengajaran dan Pembelajaran (PdP) bahasa Jepun kepada pelajar UMP yang mengikuti subjek ini sebagai subjek elektif mereka.

Reka bentuk pengajaran *Flipping* bahasa Jepun yang dilaksanakan adalah melalui elemen 3S, sebelum, semasa dan selepas. Biasanya sebelum kelas bermula pelajar diminta untuk membuat persediaan seperti membaca bahan seperti buku teks, nota-nota yang boleh di akses di KALAM (platform yang dibangunkan oleh

UMP untuk rujukan pelajar. Yang boleh dimuatkan dengan nota-nota dan video) berdasarkan topik yang akan dipelajari, menghafal kosa kata, meneliti video. Setelah persediaan awal telah dibuat, ini memudahkan proses pembelajaran semasa di dalam kelas, di mana pensyarah akan memberi penerangan dan panduan aktiviti yang akan dilakukan oleh pelajar. Antaranya pelajar diminta untuk membuat latihan membuat ayat, aktiviti soal jawab berdasarkan topik pada hari tersebut bersama rakan lain. Seterusnya, elemen S yang ketiga iaitu selepas PdP, pelajar akan dinilai berdasarkan tugas yang diberi dan akan dinilai melalui empat ujian penilaian (mendengar, bercakap, membaca dan menulis).

Inovasi ini penting dalam proses PdP bahasa Jepun kerana melalui inovasi ini suasana persekitaran dan elemen kebudayaan Jepun dapat ditampilkan dan ianya menjadikan PdP lebih seronok sekaligus motivasi pelajar dapat ditingkatkan untuk menguasai dan mempelajari asas bahasa ini. Pelajar juga dapat berinteraksi sesama mereka dengan lebih aktif sama ada sebelum, semasa dan selepas kelas.

Kelebihan inovasi ini ialah menjadikan proses PdP menjadi lebih interaktif dan mampu meningkatkan motivasi pelajar mempelajari bahasa Jepun. Hal ini demikian kerana inovasi ini juga menerapkan budaya Jepun di samping memasukkan elemen tempatan Malaysia (khususnya elemen makanan) yang disesuaikan dengan kebudayaan Jepun dalam proses pembelajaran. Selain itu, inovasi ini juga mudah di akses kerana platform KALAM dapat dibuka oleh pelajar mengikut waktu yang mereka inginkan.

Potensi Pengkomersialan

- 100% Pelajar UMP
- Pelajar IPTA Malaysia
- Pelajar sekolah Menengah dan Rendah
- Pelancong Malaysia
- Kementerian Pelancongan dan Kebudayaan Malaysia

Pengiktirafan: - No. IP: LY2017001528

- Penyelidikan: RDU150303
- Penerbitan: Buku, Jurnal, Prosiding (ISBN & ISSN), Portal
- Penganugerahan: - GOLD MEDAL: (CITREX) 2017, UMP
- SILVER MEDAL: (ITEX) 2017, KL
- SILVER MEDAL: (IUCEL 2017), USIM

Penghargaan

Inovasi ini mendapat pembiayaan daripada Centre of Instruction Resources & E-Learning (Cirel) Universiti Malaysia Pahang untuk menyertai Pertandingan IDEL di International University Carnival On E-Learning 2018 di Universiti Islam Antarabangsa Malaysia.

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ID NO. UMP 007
TOPIC: Enriching Learning Experience of German as Foreign Language

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Abstract

Social media enriches the language learning experience by allowing to connect and interact in exciting ways and through the target language, work collaboratively, and enhance their linguistic and pragmatic proficiency. Social media such as Instagram provide a platform where users can dialogue, exchange ideas. Inst@gogy is specifically look at current androgogical practices that are linked to social networking communities by integrating social media in adults' language learning in tertiary level. The theoretical approach of this method driven by psycholinguistic theories integrate the interaction hypothesis and noticing, while sociocultural research, based on Vygotsky's theories of social learning within communities, looks at how language learning is mediated within those contextual alignments. The distinctive feature of Inst@gogy approach is the scaffolding ICC-Alignment model giving emphasize on developing learner's language skills and communicative competency by manipulating available free contents in Instagram and also as a content creator. Thus the cost effectiveness using Inst@gogy is free it will not only allow a vast participation among students.

Keywords: social media, Instagram, language learning, social learning theory

Introduction

Social media enriches the language learning experience by allowing to connect and interact in exciting ways and through the target language, work collaboratively, and enhance their linguistic and pragmatic proficiency. Social media such as Instagram provide a platform where users can dialogue, exchange ideas. Inst@gogy is specifically look at current androgogical practices that are linked to social networking communities by integrating social media in adults' language learning in tertiary level. The theoretical approach from Vygotsky of this method driven by psycholinguistic theories integrate the interaction hypothesis and noticing, while sociocultural research, based on Vygotsky's theories of social learning within communities, looks at how language learning is mediated within those contextual alignments(Holzman 1996). The distinctive feature of Inst@gogy approach is the scaffolding ICC-Alignment model giving emphasize on developing learner's language skills and communicative competency by manipulating available free contents in Instagram and also as a content creator. Thus the cost effectiveness using Inst@gogy is free it will not only allow a vast participation among students

Objectives:

Inst@Gogy is a web 2.0 platform using Instagram mobile based app is developed to enrich learner's language proficiency constructed through in ICC Scaffolding-Alignment Model. It is also helps the learner:

- To create meaningful written and speaking German as foreign language learning in their daily communication
- To motivate communal learning experience via using social app Instagram within adults
- To provide easy-access and flexibility of learning via online platform

The conceptual ideas of Inst@gogy in a combination of three elements which is stated as below

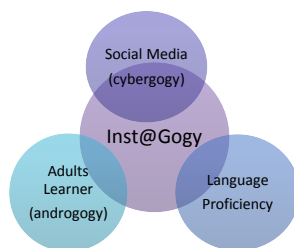


Diagram 1: Conceptual Ideas of Inst@gogy

Novelty:

Based on to Blyth (Blyth 2008) there are four distinct categories to language learning; technological, psycholinguistic, sociocultural, and ecological and Vygotsky's theories of social learning (Vygotsky 1978). Inst@Gogy changes at how language learning is mediated in cybergogy to adults learners in learning German as foreign language learning. Inst@gogy is driven by DICC Scaffolding model

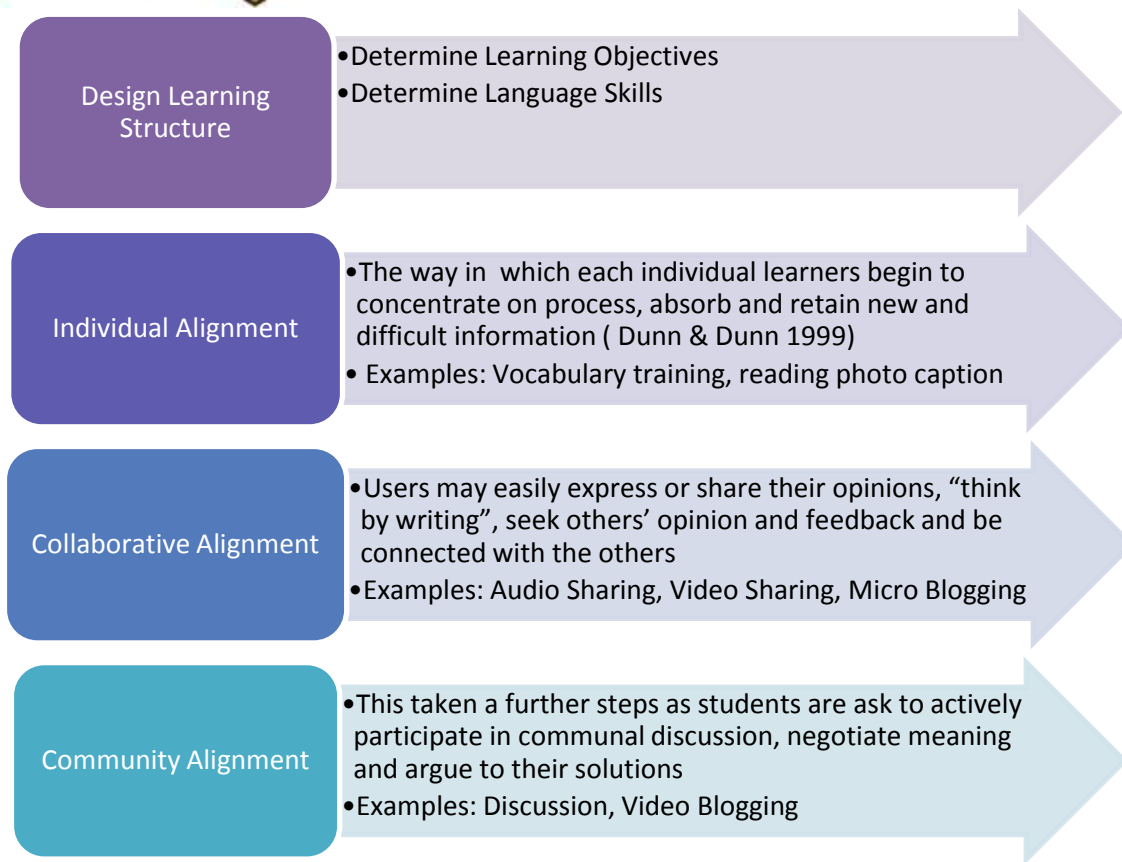


Diagram 2: DICC Scaffolding Model

USEFULNESS

Inst@Gogy provide a new language learning experience by the power of social networking and crowdsourcing. The lessons designed using Inst@Gogy are primary focusing on providing learners from zero to hero.

The language exercise various multimedia sources that already in Instagram (i.e. mini video clips and pictures) motivate and maintain learner's interests.

Profiting from Social Media networking the usefulness or benefits of using this methods are as follows:

- boost interaction by sharing the media and caption worldwide
- Offers authentic meaningful feedback from native speakers and networks friends
- Being able to set privacy learning environment e.g: low-anxiety (private) active (public)
- Collaborate actively in community around the globe



Inst@Gogy is a cost effective language learning methods with intended to utilizing the current social networking experience and combining with language learning. Several studies were conducted to examined the effectiveness this method in learning German as Foreign Language in UMP. The results from the 60 learners using Inst@Gogy approach illustrate positive outcomes in speaking competency in their final exam result. The weekly progress of the students is also being observed and show the progress of student's confidence level increasing. Thus, the online manual guide on designing the language learning is in the website.

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ID NO. UMP 008
TOPIC: VOC@AWL FOR LEARNING VOCABULARY

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Abstract:

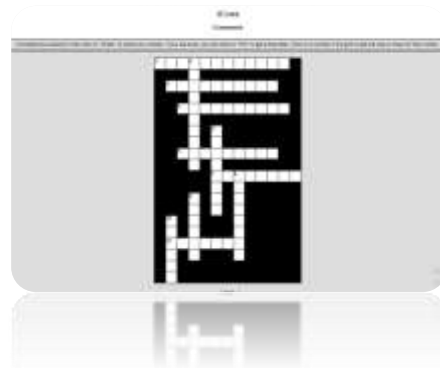
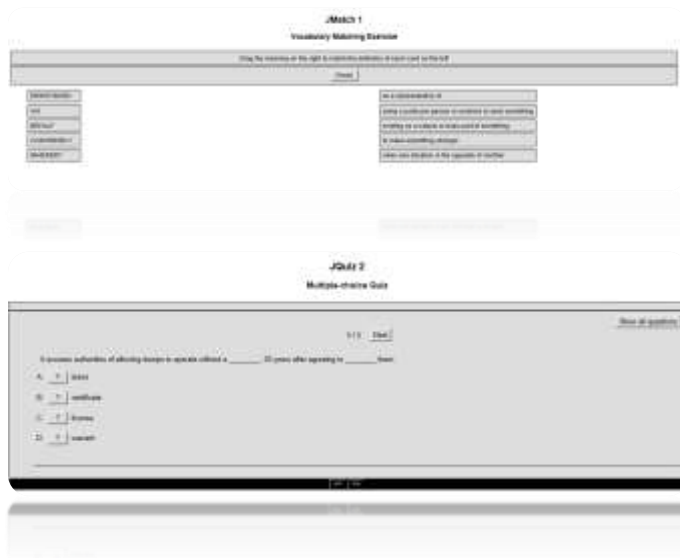
The use of technology for language learning is powerful in reaching its audience especially second language learners. In learning vocabulary, Hot Potatoes that integrate five (5) exercises namely JMix, JCloze, JCross, JMix and JMatch are able to assist students in assessing the depth and breadth of vocabulary knowledge of selected target words in Academic Word List (AWL) in the current study. Moreover, the platform is able to provide an avenue for 'assessment as learning'. In other words, the use of Hot Potatoes is able to assist learners in making them to be more autonomous in their learning. Nevertheless, the objectives of the study are to identify the students' opinions on the design of Hot Potatoes, gauge the usefulness of the tool and finally to determine its effectiveness in assisting them to learn vocabulary. The study that employs approximately 200 tertiary level students showed that Hot Potatoes has interactive as well as interesting design. Students also perceived that the tool is useful in making them to be confident in learning vocabulary. Finally, the results of the study showed that Hot Potatoes are beneficial in learning the targeted vocabularies. The implications of the study, therefore, relates to learners in providing them to learn and simultaneously assess the depth and breadth of the targeted vocabulary.

Key words: *please provide up to 5 keywords. Please try to stick to one line.*

Innovation Descriptions

Voc@AWL is a platform that is employed by the teachers to assess their learners' ability in the latter's ability to learn vocabulary – Academic Word List (AWL). The innovation in Voc@AWL lies in making the students to learn more flexibly following the constructivist learning environment in that learners are able to construct

knowledge when they are engaged and excited in their learning. Using Hot Potatoes, learners take the chance in making mistakes as they attempt to figure out the possible answer for an item in the quizzes - JMix, JCloze, JCross, JMix and JMatch. To date, it seems that only the current researchers use Hot Potatoes integrating AWL to gauge tertiary level students' ability in learning vocabulary.



Background of the innovation

Voc@AWL employs Hot Potatoes as its platform for its innovation. The use of the tools enables the researchers to use the platform for 'learning as assessment'. Such is evident since the program integrates six [6] types of interactive quizzes in the forms of multiple-choice, short-answer, jumbled-sentence, crossword, matching/ordering and gap-fill exercises and hence, able to guide students in setting their own goals for learning vocabulary. Besides that, they are able to monitor their progress and provide feedback in their attempts to identify the correct targeted vocabularies. For the research project in particular, the researchers have provided a series of exercise are that are available at this link: <http://www.languages.dk/online/anna/>. Twenty (20) exercises catering 53 vocabularies are designed for the purpose of investigating the use of Hot Potatoes in learning vocabulary.

The importance of Voc@AWL to education

Voc@AWL is important to education especially in learning vocabulary since it provides learners to become familiar with the selected vocabulary. Moreover, it serves as a platform to engage learners with challenging opportunities to practice the knowledge of the vocabulary that they may already know. This means, for the vocabulary in which they have the knowledge with, it seems that Voc@AWL can make them become more confident and competent self-assessors of the targeted vocabulary in terms of depth and breadth.

Advantages of Voc@AWL towards education and community

In general, the advantage of Voc@AWL is in its ability to create learners with an environment where it is safe for them to take the chances of making mistakes, and yet, correcting it in their next attempts of doing the quizzes/ exercises. In addition, for the advantage of Voc@AWL for the community, the fact that Hot Potatoes is a user-friendly program may prove to be beneficial for those (public in general, teachers/ practitioners, any individual in particular) who do not have programming knowledge to set-up their own quizzes and lessons. The advantage of Voc@AWL for education lies on the platform itself as it is an e-learning and computer based education that provides both, learners and educators to manipulate the way both groups of individuals in their learning and teaching (or assessing).



Commercial value of Voc@AWL

Voc@AWL Hot Potatoes is a free of charge for non-profit educational users and therefore, training can be conducted on its use to benefit language practitioners or to other group of individuals.

Acknowledgement

We would like to thank to CIREL for giving us the opportunity to participate in this research competition. In particular, we would like to express our utmost gratitude to Dr. Gan Leong Ming for his support and ideas in the preparation of the contents of the presentation. We would also like to thank Universiti Malaysia Pahang (UMP) for the research grant that is granted to us - RDU1603144. Last but not least, thank you to the students who have contributed in the research as well.

ID NO. UMP 009	TOPIC: From Classroom to Global Community: i-E.R.A.T D.I.Vo. N.A.V.i A.D.A.M.

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Abstract:

The constructive alignment to embed and engage the university core courses of Ethnic Relations in teaching and learning technical and engineering students in University Malaysia Pahang (UMP) lead to both technical and operational challenges. *Edmodo* is one of the e-learning platform used to enhance the teaching and learning of university non-engineering core courses in UMP. Despite enticing students' learning interest through the adaptation of *Edmodo* in **i-E.R.A.T** it also supports the university's educational outcomes on team working, leadership and problem solving; which reflect National Education Policy on social cohesion while simultaneously

produces graduates equipped with knowledge, skills, ethics and morality. The initiatives of constructive alignment in integrating the subject matter of the core courses of Ethnic Relations is to overcome the TRIPLE E CHALLENGES of EMBED, ENGAGE and ENTICE the technical and engineering students in UMP. Apparently, the initiatives have grown beyond classroom experience into the global community engagement and recognition through **i-E.R.A.T. DIVo NAVi: ADAM** as global diversity management tools for global rendezvous and inclusiveness. This innovation is in line with the nine pillars of Industrial 4.0 and Generation Z friendly of self-learning, just in-time, visual, collaborative with heutagogy, cybergogy and peergogy learning approaches. It extends from e-learning to e-training as per classroom experience into global community platform via mobile applications, Massive Open Online Course (MOOC) available as a custom made package available to all. Significantly this innovation upholds the aspiration of UMP's vision and mission in "communitizing technology" makes learning available to all across generations, geographical, socio-economic status and space boundaries.

Key words: *Constructive alignment, diversity management, heutagogy, cybergogy and peergogy.*

Content

Introduction

The constructive alignment (Pathak, 2016) of the 3 in 1 package of **i-E.R.A.T. DIVo NAVi: ADAM** in which to entice, embed and engage is a comprehensive integrated e-learning modular approach in teaching Ethnic Relations to UMP technical and engineering students. **i-E.R.A.T. DIVo NAVi: ADAM** aims to inculcate social cohesion and complies with the university educational outcome (UEO) of UMP, Engineering Accreditation Council (EAC) simultaneously. This extended abstract describes the **design, background, significance, advantages and commercial values** of **i-E.R.A.T. DIVo NAVi: ADAM**.

Design

i-E.R.A.T. DIVo NAVi: ADAM is an innovative initiative of the existing model of constructive alignment by Biggs (de Hei, Strijbos, Sjoer, & Admiraal, 2016). **i-E.R.A.T. DIVo NAVi: ADAM** is design by observing input, process output format (I.P.O.) (Pimmer, 2015) of the service, quality and performance model. It focuses on how the input which is the university, EAC and the Ministry of Higher Education policy can be delivered (known as process) through teaching and learning with integrated and intended outcome (known as output) simultaneously. It applies an integrated approach in the teaching and learning rather than the conventional segregated approach with three objectives.

Background

The background of **i-E.R.A.T. DIVo NAVi: ADAM** is an effort to response to the challenge of teaching non-engineering core courses such as Ethnic Relations to the technical and engineering students of UMP (Nordin, Norman, Embi, Mansor, & Idris, 2016). The instructor exerts to meet all the requirements of the teaching and learning process but at the same time to create a conducive learning ambiance that suits the learning interest of these students. The innovation fundamental principles is based on how to optimize the students' retention of the Learning Pyramid (Hamat, Embi, & Hassan, 2012). The highest score of 90% is by teaching others. Thus, **i-E.R.A.T. DIVo NAVi: ADAM** is designed based on this principle.

Three objectives of **i-E.R.A.T. DIVo NAVi: ADAM**: first is to entice the learning interest of the technical and engineering students to learn Ethnic Relations. For instance, the optimization of Edmodo as an integrated and modular e-learning platform suits their learning interest. Secondly is to embed the academic requirement and policies of the university, EAC and ministry comprehensively. For example, all the teaching and learning activities for the 14 academic weeks observed such as lecture and assessment are policies compliant. The third objective is to engage both students and instructor within 14 academic weeks via real and virtual platforms. **i-E.R.A.T.**



DIVo NAVi: ADAM allows more flexible time and space to interact and giving feedback on the lecture contents and performance.

Significance

Majority of the students gave a positive feedback towards lecturer's performance. About 68.27% strongly agree that lecturer knew the material well. On Item 2, lecturer was innovative and creative in conducting the course and majority of students (63.45%) strongly agreed. About 94 students (64.82%) strongly agree with the Lecturer's responsive feedback via Edmodo. Majority of students (n=99, 68.27%) strong agree that their lecturer encourage student to use technology in e-learning (example: completing assignment, project, lab work). 92 students (63.44%) strong agree with the lecturer encouragement by using Edmodo as two communications, i.e. in lesson and finally, about 94 students (64.82%) strong agree with the resource materials which was uploaded. This result signifies that **i-E.R.A.T. DIVo NAVi: ADAM** are able to:

- Inculcates **social cohesiveness** among students towards achieving unity.
- Provides **3 in1 teaching and learning techniques** which is university, government and EAC policies compliant.
- Promotes **creative and interactive platform** for both students and instructor feedback and engagement that suits technical and engineering students' learning interest.
- Allows **flexibility of time and space** for both instructor and students outside official lecture hours.
- Enables to **convert subjective and intangible concepts and theories** in social sciences into **objective and tangible output**.
- Allows **team working and problem solving** to be translated by **learning by doing** mode.
- Extends the inculcation of social cohesion into **living academic experience** in both in the real and virtual world.

Advantages

Apparently, the advantages of **i-E.R.A.T. DIVo NAVi: ADAM** are as the following:

- **Best Practices** in **teaching and learning non-engineering core course** to the technical and engineering students
- **Enhance Teaching and Learning process and performance** for both students and instructor with good grades and awards.
- **Promotes positive teaching and learning ambiance with rewarding win-win situation** for all parties: since everyone can enjoy and witness the importance of effective and efficient teaching and learning processes. (eg: EAC accreditation and observe the university and national educational policy like Education 4.0.)
- Extended documents such as **posting, feedback, virtual learning contents** can be served as **evidences and back-ups** for the conventional documents.
- Supports effort to promote **cost saving, time and space optimization**.

Commercialization Potentials

Finally some of the commercial potentials which are focusing on **inculcating social cohesion and unity: team working, leadership, problem solving and conflict resolution** are:

- Training Module
- Book Chapter
- Book
- Article in Magazine & Newspapers
- Journal Publication
- Mobile Applications



- Gamification

Conclusion

. **i-E.R.A.T. DIVo NAVi: ADAM i-E.R.A.T** is an innovative and integrated initiatives of constructive alignment in teaching Ethnic Relations which is non-engineering core course to the technical and engineering students. The aim to inculcate social cohesion among students via Edmodo as one of the e-learning platform complies with the university, EAC and aspiration of Education 4.0 accordingly and simultaneously. . **i-E.R.A.T. DIVo NAVi: ADAM** provides more space and time for both students and instructor to engage within the 14 academic weeks to share course contents, keep track with the assessment with both real and virtual feedback effectively and efficiently.

Acknowledgement

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ID NO. UMS001	TOPIC: Gamified Online Learning Design: GOLD for score in medical education

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Abstract

Background of Innovation

The abstract knowledge of Electrocardiogram (ECG) is tough for medical students to comprehend and furthermore, it needs higher order cognitive skills to apply the attained understanding into graphic analysis and interpretation in order to make a correct clinical diagnosis. Several studies have shown that the graduate medical students are lack of proficiency and confidence in ECG interpretation and in turn, they tend to be dissuaded to learn ECG more. Such negative affect state toward learning has a substantial impact on the learning process, academic performance and success in a particular subject, but has been received relatively little attention in the medical education research. If these affective state cannot be improved, medical students could not only fail to achieve the targeted learning outcome but also it could affect the diagnostic accuracy to correctly interpret ECGs by those graduated medical doctors in the real clinical world. The increase in the development of technology has ushered in the use of new teaching and learning strategy such as gamification to enhance learning in medical education. Preclinical and clinical medical training have evolved from the use of traditional approaches in order to infuse the new tools and media into the curriculum that is required to meet the needs of the internet generation. Thus, many medical schools have begun to incorporate technology-enhanced active learning and online blended learning in medical education. Gamification in the medical field is still new. Therefore, more empirical research is needed to prove the effectiveness of gamified learning in medicine. Furthermore, little is known how game elements impact on motivation, engagement of students and their learning performance.

Objectives

The objective is improve motivation, engagement and competency of ECG knowledge and interpretation skills among preclinical and clinical year medical students within the limited teaching time by developing digital gamified learning platform.

Methodology

An experimental action research was conducted among pre-clinical and clinical year medical students in the faculty of medicine and health sciences, University Malaysia Sabah during the academic year 2017-18. Independent students' t-test was used to analyze the mean score differences between two cohort groups among pre-clinical year and clinical year students respectively.

Game Elements involved in GaMED ECGTM platform

The GaMED ECGTM platform incorporated a game-based technique as a strategy to deliver positive learning outcomes to students. Some of the features that were implemented to deliver these include the following:

Competition. Competition is an action to win that can be done by individuals competing against each other. GaMED ECGTM evokes the competition instinct within users to be more productive and motivated. This aims to trigger students' engagement and performance.

Leaderboard. It ranks learners based on their achievement and enables them to see the performance of each other. A leaderboard is the main reason for players to compete with each other.

Social Interaction. It involves a real-time communication that gives students the opportunity to interact and invite other users to participate the lesson.

Analytics. This is an indicator tool that determines how satisfactory the platform engages the students.

Badge. Registration badge, early bird badge, bronze, silver and gold medal badges are used in GaMED ECGTM to represent users' accomplishment that has a meaningful result of an activity. Its main purpose is to engage in positive learning behavior, and to identify progress in learning and credential engagement, learning and achievement. When it comes to engagement, a positive effect had shown more in online learning environments.

Level. Students must show a certain level of understanding and pass the previous level to unlock the next level and proceed academically.

Timer and challenge. Students can take challenge game with opponents in real time in GaMED ECGTM; this gives rise to continuous improvement through peer learning. This, in turn, makes the GaMED ECGTM platform very unique in its kind and this platform intends to train the students in enabling to interpret ECG accurately and as quick as possible to conquer the challenge game.

Failure to fail. GaMED ECGTM allows users to try again after game over, making failures recoverable. This freedom to fail allows students to experiment without fear of failure and increases student commitment.

Design Principles for ECG Platform

The instructional design of GaMED ECGTM platform has undergone standard rules and principles of human-computer interaction (HCI). The HCI design rules offer the guidelines to be followed during the system development process. In general, there are about ten essential rules that govern the UI design process. These rules are also employed in the development of the GaMED ECGTM platform. As far as GaMED ECGTM platform is concerned, five design rules have been realized to be consistent in the development process.

Knowing the Users. This means knowing what the users need, their behavior and expectations towards the system or application. This could easily be fulfilled by knowing the demographic data prior to conducting the design process. For this, background studies and literature have been conducted prior to GaMED ECGTM development process.



Anticipate Mistakes. During the design process, it is necessary to know that users always make mistakes. Therefore, a good design is that one which informs users about their mistakes and how they can avoid them. The saying "To err is human" is widely considered in this design rule. Likewise, the GaMED ECG[®] platform makes use of conventional design rules such as using pop-up messages for warning users or making buttons inactive if no appropriate data has been entered in the input field.

Instant Feedback. Providing immediate feedback is one way to facilitate user behavior. In the real world, environment gives instant feedback towards our actions. Therefore, it is ideal to give feedback to users so that they will be aware of their actions and directions of use. Similarly, the GaMED ECG[®] platform provides users with instant messages on every action of interaction for better user experience.

Use of Standards. A successful development is the one that abides by standard rules and guidelines of human-computer interaction (HCI). This is accompanied by using the conventional way of designing the interface (UI). While re-inventing the interfaces is not a bad idea, it is highly not recommended. The users are deemed to using the systems based on their past experiences. Therefore, any new design or complicated innovation will give users a hard time to use the platform. That being the case, GaMED ECG[®] platform is adapted to a simple and user-friendly interface design.

Familiarity. Familiarity is one of the significant parts of interface design. A good system would require users to easily understand how they can use it without having someone to teach them. GaMED ECG[®] platform is, therefore, a self-explanatory in its use.

Results and findings

A new gamified ECG learning platform (GaMED[®]) was developed in this study to improve the efficiency of ECG teaching and learning in the online and blended learning approach. An instructional design ADDIE model was followed in developing an online gamified learning platform GaMED ECG[®]. The GaMED ECG[®] platform incorporates a game-based technique as a strategy to deliver positive learning outcomes to students. Constructivism learning theory and experiential active learning theory was applied for gamified ECG learning. A GaMED ECG[®] prototype was developed for ECG learning and then, GaMED ECG[®] software practicability was tested. As the online blended learning approach, after traditional classroom teachings, both randomized student groups (digital gamified learning and conventional SMART2UMS Moodle e-learning) had to follow the computer-assisted instruction in the online and blended learning setting within the period of two weeks. Similarities between two cohort blended learning methods are 1) both are web-based, self-directed learning platforms 1) both platforms allow the students performing the learning activities to do practice and 2) both platforms can be accessible at anywhere, at any time asynchronously. Both cohort group students learned the same content on both platforms. After the experiment period, Modified Kirkpatrick evaluation was used to appraise the outcome of the educational intervention. Students' learning experiences and reaction toward gamified learning were interviewed as a Level 1 evaluation. After some modification of the gamified learning platform, Level 2 evaluation was executed to assess the effectiveness of learning on students' ECG diagnostic accuracy and clinical skill in which post-test results of online gamified learning group were compared with traditional e-learning group results. The findings suggest that gamification based learning is as effective as traditional conventional e-learning to improve knowledge and clinical competency in ECG interpretation skills among undergraduate medical students. Surprisingly, gamified learning enhances the faster interpretation time compared with the e-learning group in both clinical and pre-clinical year students.

Discussion

The findings reveal that GaMED[®] was perceived by medical students to be enjoyable and interesting, and hence, as a result, students had a positive attitude toward the gamified learning environment. Such positive learning experiences motivated students to participate actively in GaMED[®] ECG platform. Furthermore, gamified learning environment provided students with a rich learning environment and allowed students to collectively acquire the knowledge and attained the problem-solving skills of ECG interpretation. Therefore, gamified learning environment may be used as a tool to enhance, motivate and stimulate students' understanding of certain knowledge in the future medical education.

Conclusion

In conclusion, in view of the need for technological innovations in medical education, this gamified learning platform provides the interactive self-paced activities structured as gamified lessons to enlighten the students with ECG knowledge and skill. Further modification of this gamified learning principle and strategy is recommended to upgrade the platform into a learning management system (LMS) by supporting multiple administrative accounts.

Innovation

UMS team composed of programmers, IT technician, graphic designer, gamification expert, and lead by the researcher as an ECG context expert physician develop a new instructional method called online gamified learning (GaMED@ECG) by increasing engagement and motivation in ECG learning to improve the quality of ECG teaching.

Acknowledgement

I would like to center for Research and Innovation (PPI), UMS for funding this project under Great grant from 2017 -2018 (Project ID: GUG 0144-17/2017)

Keyword: Gamified learning, Electrocardiogram learning, Gamification, Medical Education, Technology-enhanced learning

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ID NO. UMS 002	TOPIC: An Interactive Smart e-Learning System on Technical Vocational Education and Training (TVET) in Malaysia using Augmented Reality Technology

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Abstract: Please provide a 250 - 350 word summary of the project.

Skills Profession Career Focus Industry Guide is to engage Government, private, school and parents to collaborate and empowers students to identify the right skill set and develop the competencies to meet the local workforce and global markets. The objective of this project is to design and develop an interactive smart e-learning system on Technical Vocational Education and Training (TVET) in Malaysia using Augmented Reality (AR). This system provides a comprehensive e-learning system to various skills pathway and occupations in the respective sectors to deepen students' understanding of self and relate schooling to the different education and career pathways. This research modelled previously unarticulated perception experience and skill learning in AR TVET environment and to understand how this system promote learning, and what the learners can learn, given only instruction. 60 participants, who were illiterate in computer subjects, were selected. This experiment was guided by Cognitive Task Analysis and User Modelling Techniques. The participants were moved from understanding their current learning perceptions and practices to planning future learning possibilities, especially with computer aided instructions. The results shown AR technology is effective tool for promoting TVET skill learning and training and the paradigm of AR TVET, in terms of HCI methodology (users' participation). This research might effect a long-term change in the learning practice by allowing learners' the opportunity to become self-aware of their implicit beliefs, and direct examining of their learning processes. The results also suggest that a successful learning process was a joint product of learners' cognition and learning environment.

Key words: *Technical Vocational Education and Training, Augmented Reality, e-learning*

Content Objectives

- To design and develop an interactive smart eLearning system on TVET in Malaysia using Augmented Reality.
- To improve learner's engagement using AR.
- To investigate whether the learners able to adopt AR as their learning tool and identify the level of their self-directed learning readiness.

Technology Employed

In this project, technology, called Augmented Reality (AR) is applied with minimal tools to bring together with finger tracking feature as an input device. This new approach is to assist the users to resolve psychological difficulties interactively using AR technology besides the conventional educational approach. AR is a new technology where its goal is the seamless presentation of computer-driven information with a user's natural perspective of the world. AR interfaces typically involve the overlay of virtual imagery onto the real world. AR technology offers a potential solution by combining real world features with virtual objects generated by the computer to augment the scene with additional information that enhances a user's perception and interaction with the real world. This type of new approach is driven and relies heavily by two (2) major aspects: social communication and the freedom to maintain individuality in a real private space.

Advantages/Uniqueness

Human-computer interaction (HCI) has been restricted to techniques based on the use of monitor, keyboard and mouse. Recently this paradigm has changed. Techniques such as vision, sound, speech recognition, projective displays and other devices allow for a much richer, multi-modal interaction between man and machine. The main benefits of our research are to get rid of those "strange and clunky educational interface devices." Natural interaction between humans does not involve any devices or objects because we have the ability to sense our environment with eyes and ears. In principle, the computer should be able to imitate those abilities with cameras and microphones. Such a "perceptual" computer would have two great advantages: it could be built very small because cameras and microphones take up much less space than keyboards and mice and it could be very easy to use. Gestures, facial expressions and spoken words would serve as input stream, much the same way as during natural communication between humans. With minimal tools to bring together to help the users efficiently without any hassles to bring the tools to the learning place(s). This type of new approach is driven heavily by two major aspects: social communication and the freedom to maintain individuality in a real private space. This system is designed where users can explore the system and visualise the 3D contents and objects, practice, and enhance their performance in the most practical way using bare hand and also considering human factor so that the users do not feel stress and dizzy during and after using the system. This system intends to make the overall system functions simple and straightforward and enable the users to see and touch the real objects, while having interactive guided support which allows the users to work at their-own pace as well as to explore, navigate or locate any part of the system based on their choice, quickly and easily. Hence, the combination of AR technology with the education contents give birth to a new type of automated applications and act as a mean to enhance the effectiveness and attractiveness learning in a real world scene.

Usefulness

- Students can explore the system and visualise the 3D contents and objects, practice, and enhance their performance in a practical way.
- Innovate Curriculum and teaching for TVET using latest industry 4.0 technology.
- To educate teachers, parents, and students on the current scenario, capability, gaps and challenges faced by the industries' human resource needs.
- To assist educators and students to understand the concepts of abstract and how to enhance visualisation objects.
- To identify the impact of the strides in science and technology, the challenges and impact taken in the Higher Education structure.

ValueAdded

- The application of advanced techniques such as multimedia technologies, digital image processing and artificial intelligence can be incorporated in e-learning tool for TVET education.
- Application of new techniques with higher efficiency for teaching and learning for TVET students.
- Improvement of education and technology enforcement in the TVET teaching and learning.
- New methods of learning and training system for TVET education.

Expected Outcomes

The expected outcome will be “An Interactive Smart e-Learning System on Technical Vocational Education and Training (TVET) in Malaysia using Augmented Reality Technology”. The system will have practical, theoretical, and research applications. In practical terms, this system intends to enable the users to see and touch the real objects, while having interactive guided support which allows the users to work at their-own pace as well as to explore, locate any part of the system or any information based on their choice, quickly and easily. The AR System will also extend the literature on AR in TVET Education research and provide a useful instrument for researchers working in the area of AR research applications. This study will also provide an opportunity for the users to know and perceived the quality of their learning to be.



Commercialisation Potential

- Department of Skills Development, Ministry of Human Resource Malaysia
- Information Broadcasting Network (M) SdnBhd
- Planetarium Sultan Iskandar Sarawak
- Sarawak Tourism Board (STB)



Recognition

Lee, L. S., Ng, G. W., & Ooi, J. Z. (2015). Merging Graphic Design and Multimedia Features in Digital Interactive eBook for Tourism Purposes. Proceeding of International Conference on Interactive Digital Media (ICIDM), 01-05 Dec 2015, Bandung, Indonesia.

Ng, G. W., Rehman Ullah, K., & Shahren Ahmad Zaidi, A. (2016). A framework for Mobile Augmented Reality. *International Journal of Computer Science Issues (IJCSI)*, 9 (2), 419-423.

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InTEX UnimasR & D Exhibition 2017, CAIS UNIMAS, 17-18 May 2017 (**Gold Medal Award**: An Interactive Smart Directory Guide on Technical Vocational Education and Training (TVET) in Malaysia using AR Technology).

Malaysian Technology Exhibition (MTE) 2017, PWTC Kuala Lumpur, 16-18 Feb 2017 (**Gold Medal Award**: Mobile Augmented Reality Colouring Book).

PECIPTA 2011, 7 –9 October 2017, Kuala Terengganu (**Bronze Medal Award**: An Interactive Smart Directory Guide on Technical Vocational Education and Training (TVET) in Malaysia using AR Technology).

Acknowledgement

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ID NO. : UMT 001
TOPIC: i-BEaM: An Interactive Biochemistry Book Series

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Abstract: Biochemistry is known to most of biological sciences students as a 'killer' course, a course that requires students to understand the concepts of what happens in the body involving many chemical processes. Most students tend to memorize these concepts without actually understand what they are memorizing. Most of the biochemistry books in the market are also full of 'sentences' that the students may find the books a little bit boring and dull. Since students nowadays are visual learners and technology-savvy as well as Malaysia's education is experiencing the wake of industrial revolution 4.0, we incorporate two recent technologies into our book series to make Biochemistry teaching and learning activities more interactive and interesting. Each volumes in the book series is also told in a form of a story and the informations are presented in the form of attractive images. The technologies that we are using transform the information into quick response codes and superimpose them with real-world environment. In addition, the book series are also available in a flipbook form where they can store and play the book on their mobiles. Thus, the information that the books contained can be obtained easily and quickly. This book series is also suitable for school teachers and students, lecturers and public that want to learn more about biochemistry.

Key words: *interactive book, biochemistry, technology-based, QR code, augmented reality*

Description of Innovation

The i-BEaM book series was developed since February 2018 by a group of lecturers who tried to help students taking a Biochemistry course (BIO3101) in UMT embracing the concepts in biochemistry. These students learned biochemistry by memorizing without actually understands what they are doing which led to a poor performance in terms of their final grades. In addition, a survey on the use of web 2.0 tools (e.g. YouTube, TodaysMeet, TesTeach, Edmodo, Padlet, Kahoot! and Augmented Reality) (Table 1) in lecture classes showed that the students find the tools help them in understanding the topics, providing useful informations, interesting, fun and interactive compared to the traditional lecture classes. Taking these factors into consideration, we developed the i-BEaM book series which fuses learning with technology. i-BEaM stands for interactive-Biomolecules, Enzymes and Metabolism which are the three most important topics of Biochemistry. i-BEaM Biochemistry book series consists of four main volumes which are Building Blocks of Cells – The Biomolecules (Vol. I), Biological Superhero – The Enzyme (Vol. II), Food, Digestion, Energy and Metabolism (Vol. III) and Biochemistry in The Lab (Vol. IV). The book series also comes with one supplementary material, Tickle Your Brain – A Collection of Biochemistry Questions which helps the students to revise what they have learned by tackling the questions posed in this supplementary material. The volumes and the supplementary material incorporate both the QR code and augmented reality technologies to store the informations. Flow of content in the volumes are told in the form of a story so that the readers can relate the info with their surroundings. In the supplementary material, questions are divided into five types – multiple choice, structural, essay, crossword puzzle and video-based. In addition to hardcover books, the volumes are also transformed into flipbooks. The content of the flipbooks can thus be stored and played on the students mobiles.

Table 1: Data of a survey on the use of Web 2.0 tools in BIO3101 course according to % of respondents.

Criteria	Web 2.0 tools (% respondent)					
	Today'sMeet	Padlet	Tes Teach	YouTube	Kahoot	Aurasma
Increase understanding	0	9	2	39	36	14
Provides useful information	2	10	7	41	32	7
Fun	4	9	4	11	58	13
Interactive	6	10	8	12	52	13

Importance of Innovation to Education and Community

This book series is also developed not only for the higher education students but can be used by school teachers and students as well as publics that wanted to know or learned more about biochemistry. The book series can also be developed into a textbook.

Potential of Commercialization

Each of the volume in the book series has obtained copyright through MyIPO. Discussion on the publication of the book series is also in progress.

Acknowledgement

We acknowledge the School of Fundamental Science, Universiti Malaysia Terengganu for their support.

ID NO. UMT002	TOPIC: ONE STEP ONE SOLUTION ASESSMENT

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Abstract: Perkembangan teknologi yang sangat pesat telah mempengaruhi dunia pendidikan di negara kita dari tahap pra-sekolah sehinggalah ke peringkat universiti. Pengaruh ini dapat dilihat dengan munculnya berbagai sistem pembelajaran berasaskan media (*media-based learning*) yang menggunakan teknologi dalam proses pembelajarannya. Ditambah pula, kecenderungan pelajar di peringkat universiti kepada penggunaan gadget dalam media sosial tanpa had, boleh disalurkan ke arah penggunaan gadget yang lebih baik dan menguntungkan. Justeru, salah satu kaedah yang difikirkan dapat mengubah senerio ini adalah dengan membangun satu aplikasi pendidikan dalam penilaian prestasi pelajar yang lebih bersifat pembelajaran sepanjang hayat dan pengurusan maklumat yang lebih bermanfaat untuk diri mereka.

Aplikasi gadget ini akan dapat membantu pelajar menguasai ilmu dan mengaplikasi maklumat yang dipelajari semasa di dalam kelas bagi menjawab soalan ujian atau mana-mana soalan berbentuk kemahiran akal. Pelajar akan diberi peluang dan dibimbing untuk mencari jawapan yang betul, bukan untuk menghukum, sejajar dengan hasrat menjadikan kaedah pembelajaran lebih efektif dan menarik.

Sistem penilaian yang ada sekarang adalah berbentuk konvensional dan tidak fleksibel (or not user friendly) untuk membantu pelajar memilih jawapan yang betul. Jadi, satu sistem penilaian alternatif iaitu "One Stop One Solution Assessment" dicadangkan sebagai sistem penilaian yang paling sesuai untuk generasi sekarang. Dalam sistem ini penekanan adalah kepada penerapan ilmu dan pengurusan maklumat secara efektif di kalangan pelajar dalam era yang berteknologi serba canggih dan kompleks ini

Key words: *alternative, teknologi, pelajar, efektif media.*

Content

Please address as many of the following sections as possible in your paper, as relevant.

11. Description of your innovation / product development / design / process.

12. What is the context or background of the innovation / product development / design / process?
13. Why are they important to education?

For more interactive learning processes

14. Please write any advantages of your innovation / product development / design / process towards education and community.

New approach for students assessment and development.

15. Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

A maximum of 1 table and 1 figure is allowed. Please ensure that table and figure do not account for more than 2/3 of a page when taken together.

Table 1: Formatting used in heading paragraph formats, table and figure.

Format name	Font size	Font style	Blanc space	
			before	after
Heading 1	11 pt	Bold	12 pt	3 pt
Heading 2	11 pt	Italic	6 pt	3 pt
Heading 3	10 pt	Standard	6 pt	0 pt
Table title	10 pt	Standard	12 pt	3 pt
Figure caption	10 pt	Standard	3 pt	12 pt

Acknowledgement (if any)

We are grateful for the assistance from En. Mohd Hafriz Nural Azhan dan En. Abdul Hadi Ismail from E- learning Unit, UMT.

References (Use APA format)

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**ID NO. UMT
003**

**TOPIC: NAKHODA DASHBOARD: BLENDED-
LEARNING MONITORING IMPLEMENTATION@UMT**

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Highlights : e-Learning web applications allow users to interact directly with any web platforms together with other users. Some learning applications and their usage in an e-Learning platform have not been fully analyzed for student engagement in their learning activities. Big data is data collected in large quantities, whether in the form of structured or un-structured data. Big data can come from multiple sources. Nowadays, each application and equipment will have log data that is being kept that can be translated into meaningful values. In e-Learning, each student activity will be logged and recorded. However, the raw data do not make much sense. Thus, to understand their value, analytic capabilities are highly needed. Analytics is a technology that is used to translate raw data into something more meaningful to users. Data that are being collected are usually translated data useful and valuable to users. These depend much on the translation process to statistics, computer programming and operations research in order to measure the performance of any web systems. This paper reports a development of a system for the application of real-time analytic on the usage of the use of e-Learning in a tertiary institution. It includes the descriptions of the tools and statistics of the data collected by e-Learning system manager. All student access information such as geographic information, devices used, access times, courses and activities that they have accessed are collected. We describe the development of a dashboard system called Nakhoda. It is a course learning analytics platform that displays summarized learning data. One finding is that devices used to access the e-Learning system such as Apple Ipad, Iphone, Android-based and Symbian-based machines have shown to be the top four mobile devices that are actively used by students. The evidence from this study suggests that the increase of use mobile devices as a learning tool for teaching and learning gives positive response from e-learning users. As a tool, analytics data can help lecturers in analyzing their students behavior. Administration also can view the dashboard to see the overview of blended learning in university. We hope this will enhance pedagogical practices of teaching and learning.

Key words: e-Learning, Analytics, Big data, dashboards, blended learning

Introduction

Technology has now made learning more open. It is no longer using the traditional approach but has entered a new era with the use of various technologies. The use of online learning and the use of web 2.0 applications have increased the learning opportunities (Dalsgaard, 2006; Embi, 2012; Grosseck, 2009). Typically, to apply e-Learning, most universities will use a system application to simplify the management of learning. It is known as Learning Management System (LMS) (Mehrabani & Abtahi, 2012). The use of this application provides various advantages either as instructors or students in facilitate learning and potential to attract students to conduct independent learning (Mehrabani & Abtahi, 2012; Wang, Doll, Deng, Park, & Yang, 2013).

Blended learning (BL) offers an attractive education program by combining the teaching and learning (T&L) activities through the use of information technology. In this mechanism, a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path or pace

(Cashman & Eschenbach, 2003; Garrison & Kanuka, 2004). In blended learning, a form of learning called flipped classroom is perceived to be a suitable technique for T&L (Cashman & Eschenbach, 2003; Garrison & Kanuka, 2004). This method of T&L may also be described as "just in time teaching" (JiTT). Students will have to complete certain preparatory tasks before coming to class. The lecturers will discuss those answers and comments in the face-to-face classroom sessions. With the aid of an LMS, students may perform their learning through the online contents. They may take an online quiz, do an assignment and submit it online or watch video lectures before coming to class. In the face-to-face classroom with the presence of the lecturer, the solutions of the assigned problems may then be discussed. This offers a more personalized guidance and interaction with students, instead of lecturing. Thus, the students come to class more prepared and motivated to learn. Thus, the lecturers spend more time on difficult topics or common misconceptions. Ministry of Education Malaysia (MOE) has put every course offered at public universities must implement course contents in blended learning. In BL, classroom teachings are combined with online activities (Mohd Saman & Nural Azhan, 2014). MOE has encouraged the application of blended learning as one of the methods in T&L. They expect 30% of T&L are done through BL.

With the use of an LMS, students can access the system for the purpose of learning that is suited to them. Lecturers on the other hand, can monitor the learning progress when needed (Jung, 2009; Peredo, Canales, Menchaca, & Peredo, 2011; Rodgers, 2008). Monitoring the implementation of T&L may be made on logged data stored in the LMS system. The stored data typically are student grades, activities undertaken by the students, date access, student and course details. The data can be interpreted to show the performance of a student or the entire class that a lecturer is teaching (Agudo-Peregrina, Iglesias-Pradas, Conde-González, & Hernández-García, 2014; Davies & Graff, 2005; Kong, 2010). With the proper implementation of e-Learning, the lecturers can know exactly which students might be problematic. Nevertheless, the data that is displayed by the LMS is usually quite difficult to be understood by lecturers unless the data is processed and visualized in a form understandable (Kent, Carr, Husted, & Pop, 2011).

Analytics is a way to translate the data into something more meaningful that representations of information (Ali, Hatala, Gašević, & Jovanović, 2012; Kent et al., 2011). Data that are usually translated are data that are valuable. This much depends on the preparation of statistical, computer programming and operation research to measure performance (Ali et al., 2012). The preparation of analytics data requires the use of mathematical and statistical technique (Kent et al., 2011). Data that have been translated may be used to recommend actions or to assist in decision-making. Usually, these analytical tools will be used to assist the decision for the business context (Muntean, Cabău, & Rînciog, 2014; Wu, Chen, & Olson, 2014). It helps companies identify the best investments that can be made and the amount of stock and sales materials can be added and subtracted based on purchase data trend analysis (Muntean et al., 2014).

Big Data in e-Learning Environment

Big data is data collected in large quantities, whether in the form of structured or unstructured data. They can come from multiple sources. Each activity that is being performed in the T&L environment will be kept and logged for analysis purpose. In e-Learning, data comes from the learners while accessing and doing an activity in the e-Learning courses modules. Each task and activity such as access notes, logging in the system, taking quiz or log out from e-Learning will be collected. For example, once student logs into the e-Learning system and interact with learning modules, their progress, assessment results, views and other data being produced during the e-Learning course in big data. With the implementation of statistical technique combined with mathematical methods, these data can be analyzed and translated into understandable visual that can help teachers or lecturers understand and determine how the learner is acquiring information, at what pace, in what time and show to us any problems that may exist while make easier for us to understand students learning pattern.

Educational Data Mining (EDM) is a technique that is used in computer science to discovering patterns in large data sets involving multiple technique such as artificial intelligence, machine learning, statistics and database systems (Mohamad & Tasir, 2013). The goal of EDM is to transform the large data sets into an understandable structure (Mohamad & Tasir, 2013; Romero, Ventura, & García, 2008). We can conclude that, EDM consists of data mining tools that can be used to take parts in applying the analyzing method into big data (Mohamad & Tasir, 2013). Both EDM and big data are very relevant and they are much related with each other. Once we visualize it into an understandable structure it is called analytics.

Analysis and Mapping of e-learning activities to the visualization

Web Analytics is a tool that collects, measures and analyzes the usage of web system activities in order to understand users pattern in assessing the system (Kent et al., 2011; Rizzotto, 2007). Web administrators have used the analytics data for business and marketing research (Kent et al., 2011; Rizzotto, 2007; Ruipérez-Valiente, Muñoz-Merino, Leony, & Delgado Kloos, 2014). They may focus on the user needs, which product have higher hits and which section have lower hits (Rizzotto, 2007). In e-Learning, there are data that we can use in order to make assumption and to view user patterns for managing e-Learning system facilities. Suggestions may also be offered to lecturers when the best day to do quiz and which modules that will engage student more in T&L.

In developing an analytic system, the information that needs to be focused is in translating the data that are obtained from the source that can be understood by the lecturers (Ali et al., 2012; Ruipérez-Valiente et al., 2014). This is to ensure that each data that appear in analytics system can give value and help lecturer in analyze student activity in using content and participation in an e-Learning system. The main problem encountered in e-Learning system is in how we can analyze the behavior of students and monitoring student's activities to ensure students carry out the activities (Hu, Lo, & Shih, 2014; Mehrabi & Abtahi, 2012; Rodgers, 2008). An LMS has the ability in tracking student activity somehow most of it lack of analytics tools in helping lecturer defining student participation and activeness (Awang & Darus, 2012). Table 1 shows the mapping of the data sources and the analytics outcomes that are used in analyzing student and lecturer activity in e-Learning.

Nakhoda Dashboard System

Based on the mapping of the activities in e-learning to the visualizations of the students activities, a dashboard system called Nakhoda has been developed. It is a system that is used to collect and display the visualizations of the students activities. The development of Nakhoda is expected to help in monitoring the implementation of 30% activities conducted using online. The lecturer can have an idea what going on in their courses. Which activity the most give interest to the student, Lecturer can have each student profile analysis based on their activity and helping the student in evaluate the best activity that can be conducted in e-Learning. Figure1 shows the structure of the Nakhoda system. It is an extended version for Laksamana system that has been developed earlier (Nural Azhan, Mohd Saman, & Abdullah, 2011). Laksamana is a system that has applied the push-pull technology with temporal analysis. It is used to help increase the activeness of student in an e-Learning environment (Nural Azhan et al., 2011). Although Laksamana helps to increase activeness among students, the system lacks strong analysis that should help lecturer in giving decision applying the best activity and monitoring student activeness.

Table 3 : Data source and analysis outcome

e-Learning Factor	Data measured & Sample	Information Outcome / Pattern Analyze
• Device Access • Type of device • Number of Access • Type of OS use • What module they access	• Student access log • Server log • Browser type • OS type • Device information • Time access	• System / Learning Management System that need mobile view for particular device • Needed to develop native application for Mobile Device
eActivity in e-Learning	• Page Access • Server log • Users access log • Browser type • eActivity track log	• Temporal information on student access • Statistical report which eActivity is the highest in LMS • Requirement to expand e-Learning bandwidth (if using cloud) on certain time/days
Mod-blendedness measuring	• LMS resource data • Users data activity • LMS activity Modules data	• Information about courses that have reach criteria • Use the information in targeting how many courses that can reach criteria on next month based on statistical data analysed
Entering Page	• Server log • Users access log	• Information on user's first hit access. • The highest hit page is the higher student engagement • When combine with reference page information, we can know either student accessing direct or access from notification or instruction from email/message from lecturer.
Reference Page	• Server log • Users access log	• This information can help administrator know which push module help engage student most • This report can give us information on which external page that refer most before student/lecturer entering e-Learning
Exit Page	• Server log • Users access log	• Information on last page users enter before close the browser or the cookies expired. • From entering page we can know which module and action most user's done. And which page make user's exiting the LMS

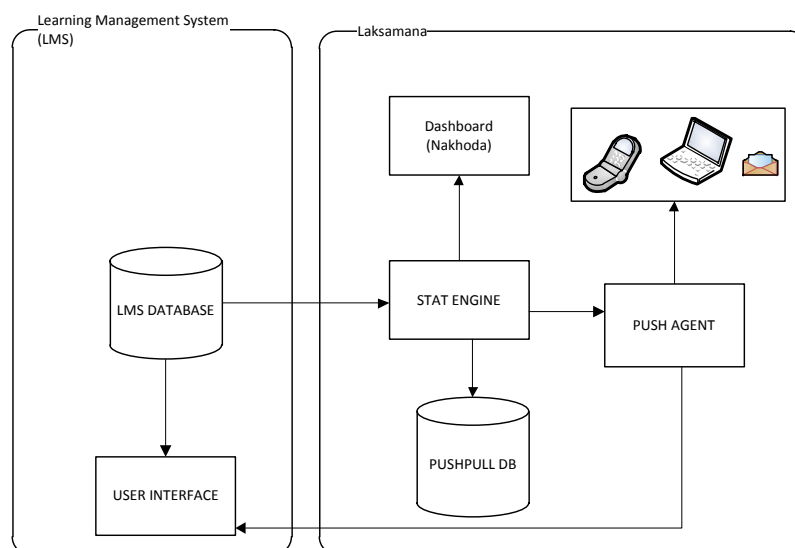


Figure 1 : **Nakhoda System System Structure**

Based on proposed interface and framework in Figure 1, we have developed the Nakhoda system that is integrated with Laksamana and LMS. The proposed interface is based on the mapping of the e-learning information required in the analysis. It aims to provide an integrated meaning for lecturers to make decisions. The display interfaces for Nakhoda have been developed in a block section which is each block are based on different analyzing result.

System displays, engagement patterns & Blended Learning Overview

Figure 2 shows the main interface for the Nakhoda system. Figures 3 to 5 show the various interfaces of the dashboard system with an integrated analysis that can help lecturer in doing an evaluation to the implementation of blended learning mode in their course that they teach. For each student profile, the system will provide the temporal analysis of student interaction in their courses and activities provided by lecturer.



Figure 2 : Main interface Nakhoda

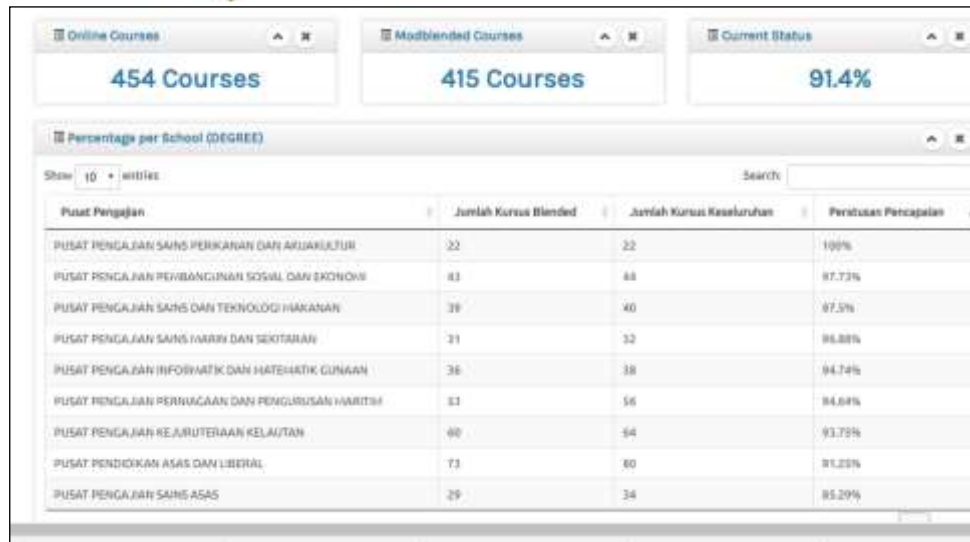


Figure 3 : Blended learning overview

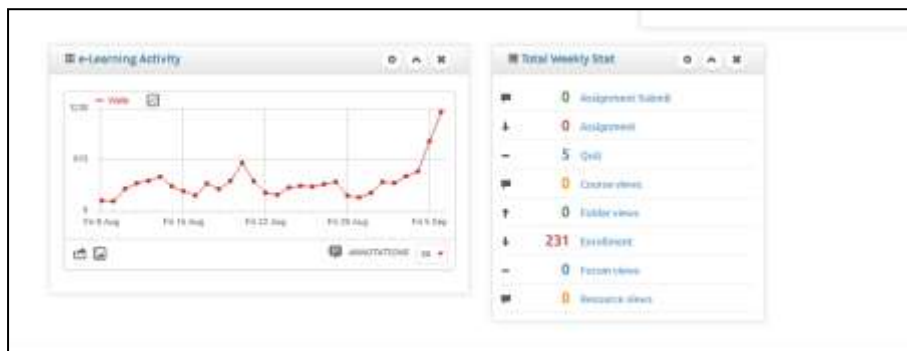


Figure 4 : e-Learning System Activity

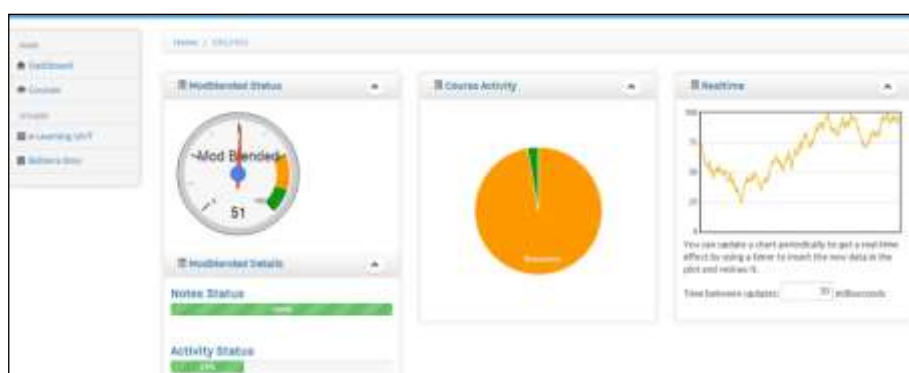


Figure 4 : Course analysis

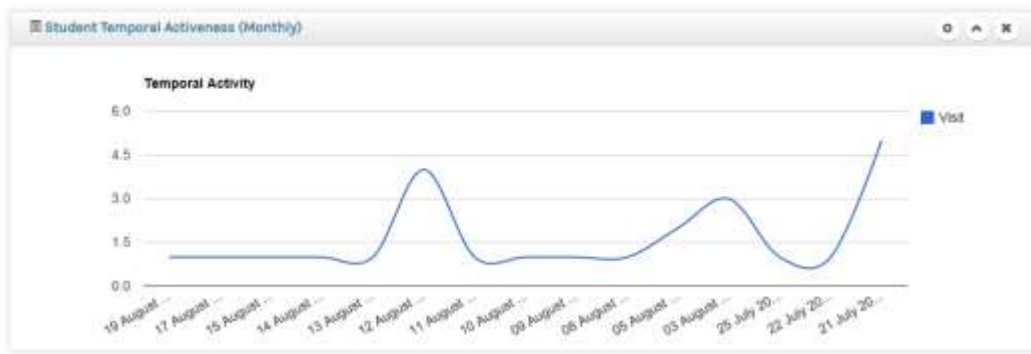


Figure 5 : Temporal Activity Analysis

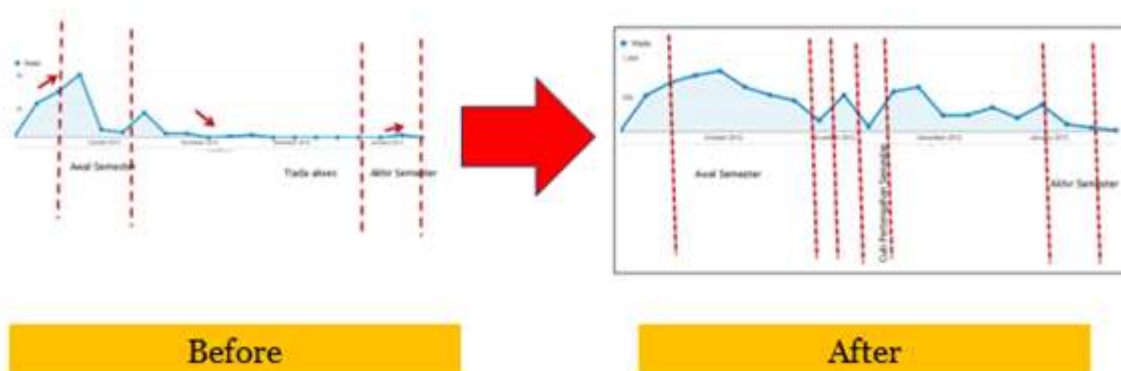
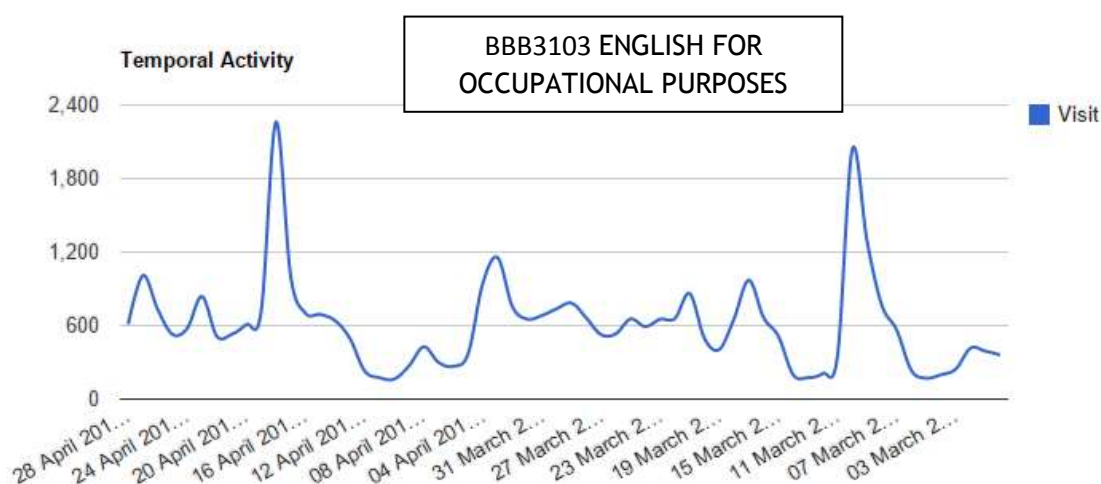


Figure 6: Increase of students engagements in e-learning (Nural Azhan et al., 2011)

In Figure 7, it shows how Nakhoda analyzes the patterns of student engagement based on the temporal data. This data are then compared and we can see there is a different patterns of student engagement assuming that each different course are using different approach of pedagogy of blended learning. With this patterns of student, we can analyze the best way to present our content with knowing that each content have highest engagement according content type or in temporal manners.



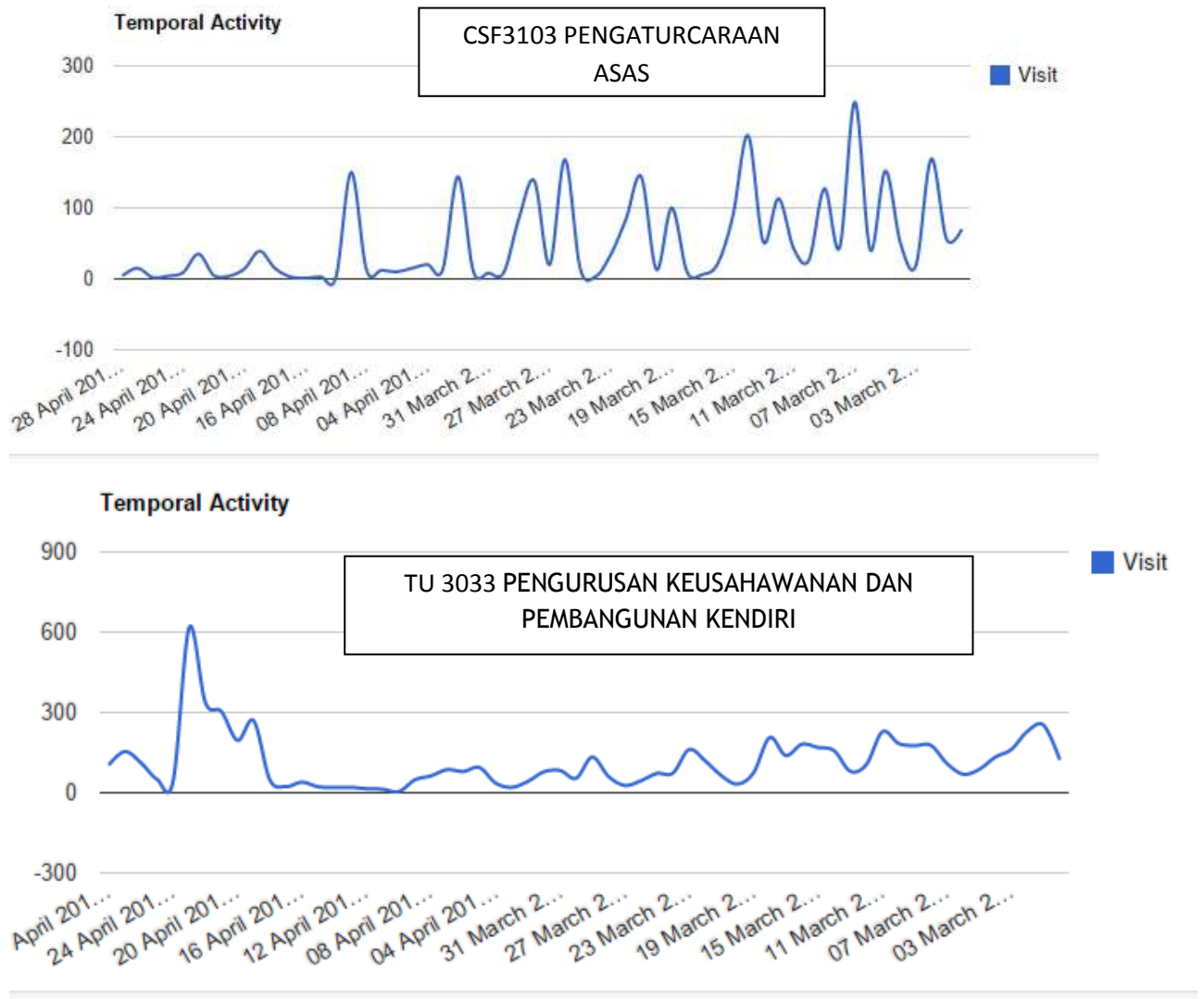


Figure 7: Different patterns of Students Engagements in e-learning

Related Works

There have been numerous research works done on analyzing big data and translated it into analytics. One of the tools in web analytics is Google Analytics (Educação, 2013; Google, 2015). It is a free web analytics tool services offered by Google (Google, 2015). It has been launched on November 2005. The main idea of Google analytics is to track and reports website traffic using integrated with Ad words. It is mostly used by e-commerce site to track conversion or goals. Goals might include sales, lead generation, user views or hit to certain files hosted in the user's website (Educação, 2013; Google, 2015).

Another tools that similar to Google Analytics is Piwik (Piwik, 2014). Piwik somehow different from Google Analytics in term of application as Piwik is an Open Source Web Analytics Platform. Piwik offers the whole system that can be installed in users own servers (Piwik, 2014; Scott Nesbitt, 2014). With Piwik, the data that collected is always own by the users and secured (Piwik, 2014). The Piwik project was first started in June 2007 in London and it was then released in September 2007. Piwik are being used for gathering and analyze important information about users that access your website, e-Commerce Analytics in analyzing revenue, orders, conversion rates and detailed product statistics and see which products are the most popular (Piwik, 2014). Dychkhoff (Dychkhoff, Zielke, Bultmann, Chatti, & Schroede, 2012) have suggested a design and implementation of a Learning Analytics Toolkit for Teacher (eLAT). eLAT design is to process large data set that enables teacher to explore and correlate learning object usage, user properties, user behavior as well as assessment result based on graphical indicators. The eLAT tool has been built for teachers to know how student react to their content and teaching approach.

Conclusion

In this paper, discussions on learning analytics have been done. Analytics is a technology that is used to translate raw data into something more meaningful to users. Data that are being collected are usually translated data useful and valuable to users. These depend on the translation process to statistics, computer programming and operations research in order to measure the performance of any web systems. A dashboard system called Nakhoda has been described to implement the analytic process. It is an extension of the system called Laksamana developed earlier in the project. The concept of analytics with smart business elements has been adopted and used in an e-learning environment. It is used to help analyzing e-learning data to help in improving the development of e-learning in terms. As the decision made by lecturer using this system can help in enhancing and improve the implementation of e-learning in the university through increased interaction between students and lecturers. Analytics offers a way to translate data into something more meaningful that representations of information. Data that usually translated is data that valuable and much depends on the preparation of statistical, computer programming and operation research to measure performance. Data that have been translated will be used to recommend actions or to assist in decision-making. Usually, these analytical tools will be used to assist the decision for the business context. It helps companies identify the best investments that can be made and the amount of stock and sales materials can be added and subtracted based on purchase data trend analysis. Future works may be focused on a fully intelligent recommender system, personalized learning, rewards system and intercepting problematic students.

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ID NO. UMT004
**TOPIC: UMTMOOC: A VIDEO-BASED REAL LEARNING FOR
ONLINE EDUCATION**

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Highlights:

Massive Open Online Course (MOOC) is an innovative approach for teaching and learning. It offers 100% via online with free or paid enrollment. Generally, MOOC courses are open and accessible to everyone to get as many enrollments as possible. Globalization coupled with digital revolution has presented new trends and opportunities for today's education. The development of digital media technology in the twenty first century has led to a rapid development of moving images as an educational medium. Higher education is experiencing a paradigm shift in how video-based learning resources are delivered. Internet technologies have enabled the delivery of interactive video-based learning while technologies like handhelds have enabled the flexibility of learning while on the go. The main concepts of UMTMOOC delivery is video-based real learning. All materials including teaching videos were set with a certain standard and quality. Teaching videos designed with a combination of video, graphics and animation. All UMTMOOC courses have been set to provide original content. Footages (raw videos) for this course are creatively recorded by the UMTMOOC team and are assisted by Subject Matter Expert (SME) at various locations such as fish farms, Chagar Hutang island, UMT Hatchery Centers and many other locations. The video development process includes recording and editing using UMT internal resources and production equipment. In addition, to ensure this course is interactive and in a social learning environment, it comes with relevant videos, notes, assessments and teaching and learning activities.

Key words: MOOC, Video-based Learning, real learning, media technology

Introduction

The development of digital media technology in the twenty first century has led to a rapid development of moving images as an educational medium. Higher education is experiencing a paradigm shift in how video-based learning resources are delivered. Internet technologies have enabled the delivery of interactive video-based learning while technologies like handhelds have enabled the flexibility of learning while on the go (Maniar et al. 2008). The Massive Open Online Course (MOOC) is one of online medium for course delivery and learning. It offers 100% online teaching and learning with free or paid course. The main concept of MOOC is integrated with accessible via networking, sharing the learning resources via online, and are facilitated by educators in the field of study. In other word, MOOC are based on learning via conservation and social networking. Interactions and ideas are depending on number of student joined in the course. The more student's taking part, then richer interactions, sharing ideas and perspectives. Learning and teaching via MOOC also allow techniques from social networks such as like, comments, follow and share. Students will get immediate responses from the learning platform that can be access and retrieve at anytime and anywhere. In other word, MOOC build on the engagement of learners who self-organize their participation according to learning goals, prior knowledge and skills, and common interests. The main benefit of MOOC is students can choose which courses they are interested in. They can learn and access it anytime, and anywhere suited to them. This will encourage self-directed, collaborative and personalized learning. The lecturers can monitor the learning progress and student performance when needed via online to make the engagement of teaching and learning always happen. Nowadays, most MOOCs are deployed in a platform that centralizes learning contents and

interactions. However, designing a MOOC is not an easy task. Educators need to face not only pedagogical issues, but also other issues of logistical, technological and financial nature, as well as how these issues relate and constrain each other. Currently, little guidance is available for educators to address the design of MOOCs from scratch keeping a balance between all these issues.

The main concepts of UMTMOOC delivery is video-based real learning. All materials including teaching videos were set with a certain standard and quality. Teaching videos designed with a combination of video, graphics and animation. All UMTMOOC courses have been set to provide original content. Footages (raw videos) for this course are creatively recorded by the UMTMOOC team and are assisted by Subject Matter Expert (SME) at various locations such as fish farms, Chagar Hutang island, UMT Hatchery Centers and many other locations. The video development process includes recording and editing using UMT internal resources and production equipment. In addition, to ensure this course is interactive and in a social learning environment, it comes with relevant videos, notes, assessments and teaching and learning activities.

BACKGROUND

The rapid development of technology has transformed the landscape and current learning methods. The use of various media in learning has begun for decades. The use of video as a medium in online learning has been widely used in most platforms offering online courses such as academy, cousera, udemy and others. Nowadays Higher Education is adopting new ways of teaching such as ways of Video-Based Learning (VBL) with the aim of moving away from the traditional classrooms (Albo' et al., 2015). Video lectures have been growing in popularity and their use is increasing both inside and outside classrooms (Giannakos, 2013). "Many higher education institutions and educational technology companies are using them as a main of self-study medium or as tool to enhance the learning process" (Vieira, Lopes and Soares, 2014). Despite VBL has a long history as a learning method in educational classes in the past decade, the interest in VBL has increased as a result of new forms of online education, most prominently in the case of Massive Open Online Courses (MOOCs) (Yousef, Chatti and Schroeder, 2014). VBL has unique features that make it an effective Technology-Enhanced Learning (TEL) approach. Furthermore it seems to support a rich and powerful model to improve learning outcomes as well as learner satisfaction (Yousef, Chatti and Schroeder, 2014). Maniar et al. (2008), described and defined contexts in which video-based media in mobile (m)-learning situations could be more effective than learning from text or audio, by comparing the forms. Herala et al. (2017) study show that the experiences with the application of the video-based instruction have proven to be a positive step from the viewpoint of learning outcomes and the course metrics. There are a few types of videos that can use for video-based learning strategy such as Contextual Videos, Analogy Videos, Illustrative Videos and Learner-Generated Videos (Majumdar 2017). the choice of the appropriate video type depends on the content of the subject.

VIDEO-BASED REAL LEARNING IN UMTMOOC

UMTMOOC courses are more focused towards maritime and aquatic niche such as sea turtle biology and conservation, ornamental fish culture, fish parasitology and others. These courses require a clear presentation to students so that students can understand them well. For this reason, all the teaching materials for UMTMOOC courses are delivered in video-based. Real learning here means the course content is delivered in real life, local examples, local experts, local experiments and others that related.

Main objectives to implementing the video-based real learning in UMTMOOC courses are:

- o to cater for different learning styles specifically students who are 'visual learners'.
- o to grab students' attention, thus motivating them and enhance overall learning experience.

o to provide concrete real life examples, thus demonstrating the relevance of the subject to the real world.

- o To introduce UMT's expertise globally.

Figure 1 shows the screenshots from different UMTMOOC courses, where it is showed the three types of content explanation: (a) real environment (b) real lab experiment and (c) real expert interview.



Figure 1(a) – real environment



Figure 1(b) – real lab experiment



Figure 1(c) – real expert interview

Advantages of UMTMOOC

UMTMOOC main page designed with UMT niche areas including video recording and other teaching content. UMTMOOC main page also allowed access to courses and user will get notification automatically for any new content from UMTMOOC. Innovations for UMTMOOC are as follows:-

- Innovation in main video** – The main video of this course was introduced by UMT Vice Chancellor. It is a symbolic way to promote UMT before introducing the course.
- Innovation in delivery** – All materials including teaching videos were set with a certain standard and quality. Teaching videos designed with a combination of video, graphics and animation. All UMTMOOC courses have been set to provide original content. Footages (raw videos) for UMTMOOC courses are creatively recorded by the UMTMOOC team and are assisted by Subject Matter Expert (SME) at various locations such as fish farms, Chagar Hutang island, UMT Hatchery Centers and many other locations. The video development process includes recording and editing using UMT's internal resources and production equipment. Besides that, to ensure this course is interactive and in a social environment, it comes with relevant videos, notes, assessments and teaching activities
- Innovation in technology**- UMTMOOC videos can be accessed via platform or using Augmented Reality (AR) technology. This innovation enables UMTMOOC videos to play directly on the smartphone or tablet through the UMTMOOC-AR application without relying on the internet access. The technology is to facilitate access to UMTMOOC courses in a convenient way. Currently, this application is ready for UMTMOOC introduction video.



iv) **Innovation in notification**- user will automatically notify via UMT e-Learning twitter and Facebook when there is any new content added to UMTMOOC

Commercial Value

All content, including images and video were recorded originally by the UMTMOOC team at UMT research center and various locations with local samples related to UMTMOOC courses. In addition, locations were selected within Peninsular Malaysia by the UMTMOOC team and Subject Matter Expert (SME). UMTMOOC has set specific criteria for each video in order to attract students to learn in this course. Students can interact via social network features in the platform such as comment, like and share. UMTMOOC courses were offered to public for free access since 2015 and currently 8507 students joined from all over the world for example from Africa, New Zealand, Germany and other countries. UMTMOOC content and logo also applied for an IP copyright from UMT Research and Management Centre to make sure all contents in UMTMOOC are protected by copyright.

Conclusion

MOOC become a video-based real learning model that allows students to watch video lectures as homework and learn from them. As this, teaching and learning activities will have a huge benefit. Video based learning are foreseen to ruling the current teaching and learning trend.

Acknowledgement

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ID NO. UNIKL 001	TOPIC: REDOX BOOSTER: 2D INTERACTIVE VISUAL CHEMISTRY LEARNING FOR SPM STUDENTS.

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Abstract

Chemistry is a part of science that is seeking the answers to the questions of what, why and how natural phenomena related to the structure, composition, and properties of a substances. The Sijil Pelajaran Malaysia (SPM), or the Malaysian Certificate of Education is compulsory for all fifth-year secondary school students in Malaysia. Under the SPM, there are elective subject for Science and Mathematics which is Chemistry. Chemistry topics for science stream students in secondary school are considered difficult to learn. Students are usually less motivated to learn the subject because of difficulties in understanding the concept. As a result, it affects students' achievements and it is hard for them to achieve good result in Chemistry. The goal of this project is to facilitate the learning process in the form of interactive application. This research will focus on areas where students have lack of understanding in the theoretical part of the subject and not able to visualize the change process in class. The aim of this project is to provide a better and effective way to help students learn the concept via interactive e-learning application. Therefore, researchers hope this project will enhance students understanding on the Oxidation and Reduction topic and help chemistry teachers in delivering the concept of oxidation and reduction. The purpose of this research is to help students to quickly grasp the concept and visualize the process through 2D virtual laboratory. The main contrivance for student's learning improvement is in education laboratory due to limited access to Chemistry labs to conduct experiments and due to lack of safety while using the lab.

KEYWORDS: chemistry; science-stream; e-learning; visualize; 2D virtual laboratory

Content

Description of your innovation / product development / design / process.

2D virtual laboratory is one of the platform to help students learn through interactive E-learning in better and effective way. Wiphasith (2016) state that E-learning materials are effective tools to attract the attention of the participants and to capture the students' interest. The students can access contents anytime, anywhere, and according to their cognitive abilities. According to Jethro (2012) faculty, administrators, and learners find that multimedia e-learning enhances both teaching and learning. These advantages can be categorized as targeting either learning delivery or learning enhancement. Learning delivery is the most often cited advantage of e-learning and includes increased accessibility to information, ease in updating content, personalized instruction, ease of distribution, standardization of content, and accountability. 2D virtual laboratory enable students to quickly understand difficult concept and able to score in examination. As the result, researchers ensure that 2D virtual laboratory runs smoothly which the information text can easily to read and the interface learning for interactive courseware is user-friendly to the students. Therefore, researchers hope that this project will give benefit to the students who take the chemistry subject in the Malaysia Certificate of Examination (SPM).

What is the context or background of the innovation / product development / design / process?

For the primary target audience is for students and teachers who are taking and teaching chemistry subject for Certificate of Examination (SPM). Students age range are between 16 years old – 17 years old where they are in form four and form five in secondary school. In this project, the topic will be focus on Oxidation and Reduction in Chapter III from Chemistry form 5 syllabus. The application will use the medium of virtual labs to enhance students' understanding in Chemistry subject. This is because students are more focused on learning a subject in visual form. One of the reason is they are Z generation and were expose to digital technology since birth. The geographic location of the users is area of Malaysia. The primary language of the users is in English.

Why are they important to education?

The important of the product is can make students learning fast and able to score in examination. Kristen (2017) state that students become actively engaged when they are able to see concepts being studied, applied to real life. The main goal of this research is to develop an application that can enhance students understanding in Oxidation and Reduction topic. Therefore, researchers hope this application will help teachers in delivering the concept of oxidation and reduction.

Please write any advantages of your innovation / product development / design / process towards education and community.

The advantage of this project is can make students learning chemistry subject through 2D virtual laboratory in interactive way. Students are more interested on this learning as they are more interested in visuals than word. According to Kristen (2017) virtual labs are one of the most effective ways for chemistry teachers to engage their students with active learning. Virtual labs allow students to experience what it is like to experience a chemistry job in a stem field. By using of this application students can safely use labs.



Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

The commercial value for this product on the mobile or android app that students and teachers can download. This product have license to sell of the application on mobile app. It also use to Kementerian Pelajaran Malaysia (KPM) for Chemistry subject lesson and laboratory. By using of this application students will enjoyed study in Chemistry Subject.

Acknowledgement

The author acknowledges and thanks Madam Jessifa Joanna Mohd Supian, the Final Year Project Supervisor Creative Multimedia Section at University Kuala Lumpur, Malaysian Institute of Information Technology for the endless assistance and guidance in all phases of the project development. Besides that, we are grateful for supervisor who always give her brilliant idea in developing the Redox Booster: 2D Interactive Visual Chemistry Learning for SPM Students.

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ID NO. UniKL003

TOPIC: E-Learn/Web based Assessment

Questions Generator System for Primary School

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Abstract: This project is about developing a web-based exercise questions generator system for a client who is a teacher in Sekolah Kebangsaan (SK) Nusantara, Johor Bharu. Software used in developing this system are Komodo Edit, a free text editor based from python language and SQL as the database. The editor component is implemented using the Netscape Plugin Application Programming Interface (NPAPI), with the Scintilla view embedded in the XML User Interface Language (XUL) interface in the same manner as a web browser plugin. The system contains user and admin component. Besides providing a medium for the teacher to store exercise questions in a database through the system, the students of SK Nusantara also can answer the exercise questions via online. Students and parents will get notifications through email for every upcoming exercises and exercises that have been done by the students. The role of an admin in this project is to add, update and delete the users in the database through this system. The admin also can add, update and delete the subject details. Usability testing has been conducted to improve the system based on the results. The purpose of usability testing is to improve the system design. Questionnaires were distributed to 20 participants from UniKL MIIT staff and students. 80% respondents agreed that the system is attractive and well designed, 75% agreed that it is easy to understand while 70% found that the system flow is clear and easy to follow. Based on the results that have been gathered, most of the respondents agreed that this system functions perfectly and easy to understand. This system helps in easing the teacher workload by providing a medium for her to prepare exercise questions to be answered by the students which can be marked automatically.

Key words: web-based, usability, software, system, user interface

Introduction

Examination process is an important activity for educational institutions to evaluate student performance. Thus, the quality of the examination questions would determine the quality of the students produced by the institutions.

Preparing examination questions is challenging, tedious and time consuming for the instructors (Md Sultan & Mohd Jamail, 2010). Exercise Questions Generator System For Primary School is a special and unique web-based system, which used for primary school that want to have a huge database of questions for frequent generation of questions. This system can be used in various subjects for exercises. Random exercise questions paper can be created with this system

anytime within seconds. Unlimited questions can be entered into the database of the system by the teacher.

Purpose and Objectives

This project is an automatic generator system which will enable a primary school teacher to automatically generate questions out of existing question stored in the database. The system will have the capability to save different levels of questions for different subjects and years selected by the teacher.

The system performs all tasks starting from preparing questions to notify the student's parent of the exercise's marks through mobile phone. This system is very useful for the teacher as it can save the questions entered and generate them randomly into a set of questions in a very short span of time thus saving a lot of her precious time. A set of questions once generated can be accessed by the students to answer it online. The teacher have the flexibility to generate a set of exercise questions.

The objectives of the system are:

- i. To create a database system for teachers to upload the questions.
- ii. To develop a web-based system that generate questions randomly.
- iii. To build self-marking web-based system.
- iv. To create a web-based system that can notify parents of the exercise schedule and students' exercise marks through email.

Scope of Project

This is a web-based system that has been developed by using Komodo Edit software because this software is simpler and easy to use. It will also use xampp which is a cross-platform web server solution and mySql database to keep the records and data.

- i. **System** – This system able to generate the questions randomly and marks the question that have been answered automatically. Its also have the ability to store unlimited questions and answer scheme for objective questions into the database. The system will provide history of student's exercises that can be viewed by the users. The parents will get a notifications by mobile phone of the exercises that will be held and exercises that have been held. The right answers that have been entered by the teacher will be used to check student's marks. It is also will be provided for the students to do their revisions after they finished their attempt to answer the questions.
- ii. **Administrator** - The admin can view all the questions that have been stored in the database. Admin also can add, update and delete user which are teachers, students and to the system. Then the admin can add, update and delete subject name and year. The admin also must insert the student and parent details. He can enter question with the answer scheme for objective questions that will be stored into the database. He also can view all the questions stored in the database. He can view all the student's marks from the database.
- iii. **Users** – Teachers, parents or guardians and students will be provided with the login ID and password by the admin. They can change their passwords after they login for the privacy and confidentiality. The teachers can enter the question with the answer scheme for objective questions that will be stored into the database. They also can view all the questions and all student's marks stored in the database. The students can access this system to answer online exercise questions that have been assigned by their teachers. They also can revise the right answer and view the history of their exercises. The students will be notified for the exercise by the email. The parents can view student's exercise marks and progress. They also will get notification through email for the upcoming exercise.
- iv. **Question banks** – The teacher must choose the subject name and year to add a question to be stored in the system. They can enter objective question only. After that, they can enter the question by selecting the level of difficulty for the question. The mark of the question will be displayed based on level of difficulty. They can generate the questions by selecting subject name, year and quantity of questions based on the difficulty level. They must entered the subject name, year and time for the exercise to be answered. All of the

questions can be viewed by selecting the subject name or year as it will arranged by the subject name and year.

Critical Analysis

For the purpose of literature review, three current methods and applications, namely, selected printed exercises books, Berita Harian Didik (UPSR) and VLE Frog have been used for comparative studies.

The findings are presented in Table 1.0. In conclusion, the new system is able to outperform the others.

Table 1.0: Comparative Analysis

Case Study Features	Exercise Book	Berita Harian Didik	VLE Frog	Exercise Questions Generator System For Primary School
Create question	x	x	✓	✓
View question	✓	✓	✓	✓
Answer online	x	x	✓	✓
View mark	✓	✓	✓	✓
View history	✓	✓	x	✓
Revision	✓	✓	✓	✓
Provide answer scheme	✓	x	✓	✓
Saved unlimited questions	x	x	✓	✓
Send notifications	x	x	x	✓
Self-marking system	x	x	✓	✓
Delete questions	x	x	x	✓

Prototype / Product Development

The main purpose for the development of this system is to fulfil the needs of a client, therefore, functional requirement is needed. In determining the functional requirements of the system, the information is gathered from the client. Prototype development has been chosen for this system as the methodology used is RAI.

Rapid application development (RAD) is a method of software development which heavily emphasizes iterative delivery that uses minimal planning in favour of rapid prototyping.

A sample of the prototype screen of the system is shown in Figure 1.



Figure 1: Main Page of the system

Figure 2, is also one of the prototype screen of the system built.

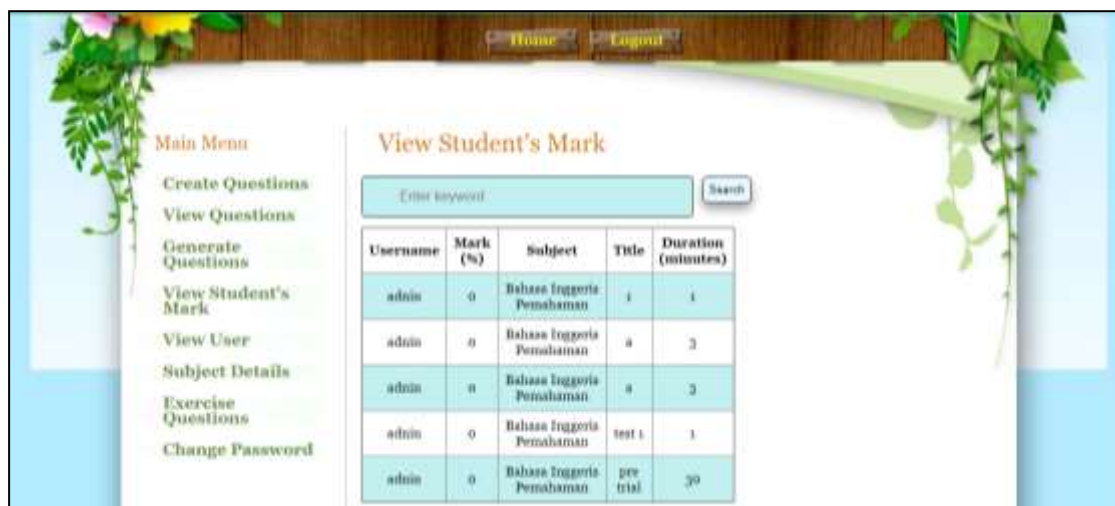


Figure 2 : Student Mark Page

Functional Requirement

Functional requirements illustrate the functions and features that need to be added in the system to meet the system requirements that have been gathered from the client. The result of the information gathering for Exercise Questions Generator System For Primary School are illustrate as shown in Figure 3.

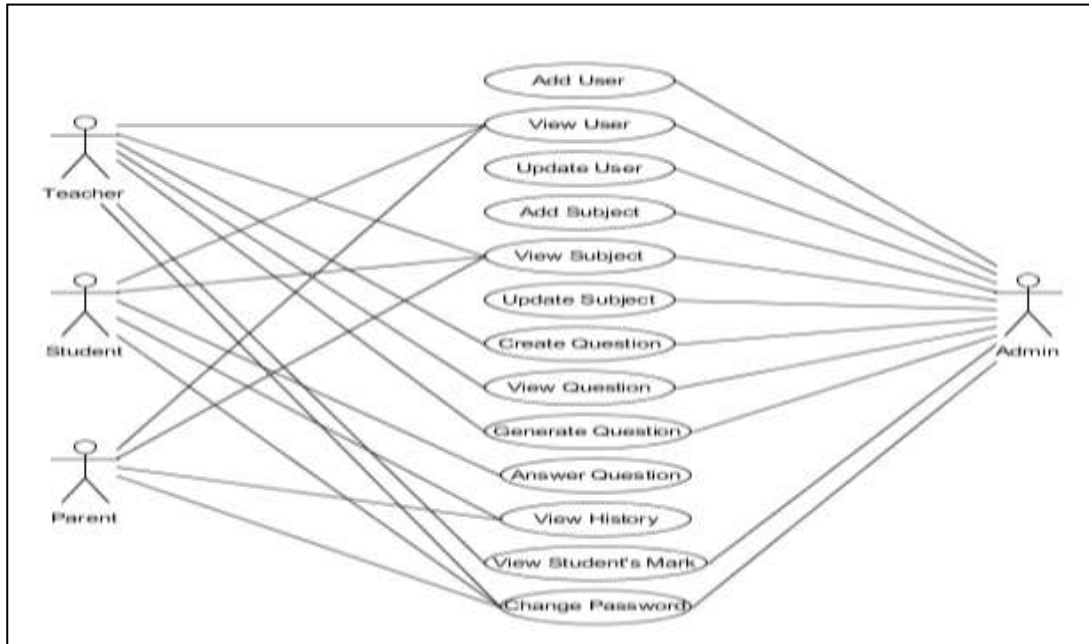


Figure 3 : Functional Requirements for the development of Exercise Questions Generator System For Primary School

Figure 3, use case diagram, which show the overviews of the requirements for the system. The major component within this particular use case diagram are the use cases, the actors, and their associations.

Figure 4 also shows the overall sequence diagram that are involve of the objects that are based on a time sequence.

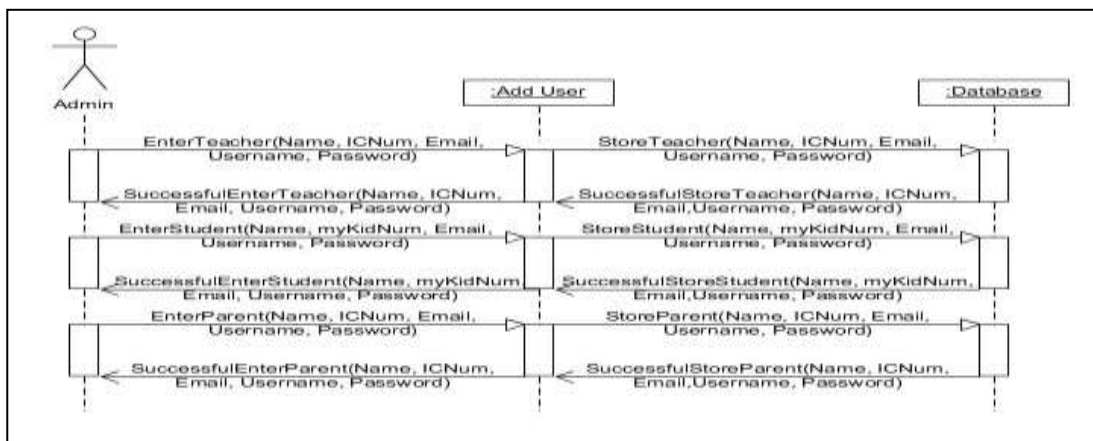


Figure 4 : Sequence diagram for admin to add user

The diagrams show how the objects interact with others in a particular scenario of a use case. The sequence diagram itself as a combination of actors, activations, objects and classes.

The functional requirements for Exercise Questions Generator System For Primary School are discussed in Table 2.

Table 2 : Functional Requirements

Requirements	Description	Source	Priority
EQGS01FR	The system should be able to validate the username and password.	3.2.1	High
EQGS02FR	The system should be able to add new user into the database.	3.2.2	High
EQGS0301FR	The system should be able to display all the selected type of users.	3.2.3.1	High
EQGS0302FR	The system should be able to delete the existing user from the system.	3.2.3.2	High
EQGS04FR	The system should be able to update user's information in the database.	3.2.4	High
EQGS05FR	The system should be able to add new subject into the system.	3.2.5	High
EQGS0601FR	The system should be able to display all the subject details.	3.2.6.1	High
EQGS0602FR	The system should be able to update and delete the subject from the database.	3.2.6.2	High
EQGS07FR	The system should be able to save new created question into database.	3.2.7	High
EQGS08FR	The system should be able to display all the questions from the database.	3.2.8	High
EQGS09FR	The system should be able to generate question randomly.	3.2.9	High
EQGS10FR	The system should be able to display generated exercise question to be answered by the students.	3.2.10	High
EQGS11FR	The system should be able to display all students' mark.	3.2.11	High
EQGS12FR	The system should be able to display the history from the database.	3.2.12	High
EQGS13FR	The system should be able to update new password in the database.	3.2.13	High

Testing

Usability testing has been conducted to ensure the prototype meet all the user requirements. This is to ensure that the system is understandable and satisfy the user need. Usability is a quality attribute that assesses how easy user interfaces to be used.

The word "usability" refers to methods for improving ease-of-use during the design process with 5 quality components which are learnability, efficiency, memorability, errors and satisfaction.

The testing has been conducted based on questionnaire that tester must answer by viewing Exercise Questions Generator System For Primary School. The tester should answer 7 questions in the open evaluation form. The function of usability testing is to collect quantitative data on participants' performance as well as determine user satisfaction with the Exercise Questions Generator System For Primary School.

A sample of 20 persons from Universiti Kuala Lumpur Malaysian Institute of Information Technology (MIIT) staff and students were selected. The method used in this usability testing is by using questionnaire.

Results

Results of selected questionnaires given to the participants are shown in Figure 5, Figure 6, Figure 7 and Figure 8.

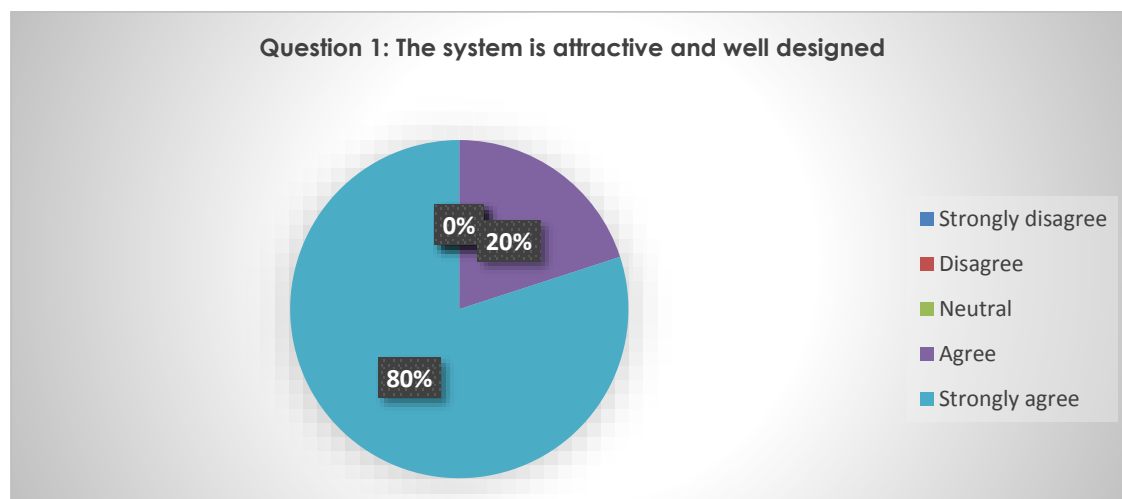


Figure 5 : Result Q1

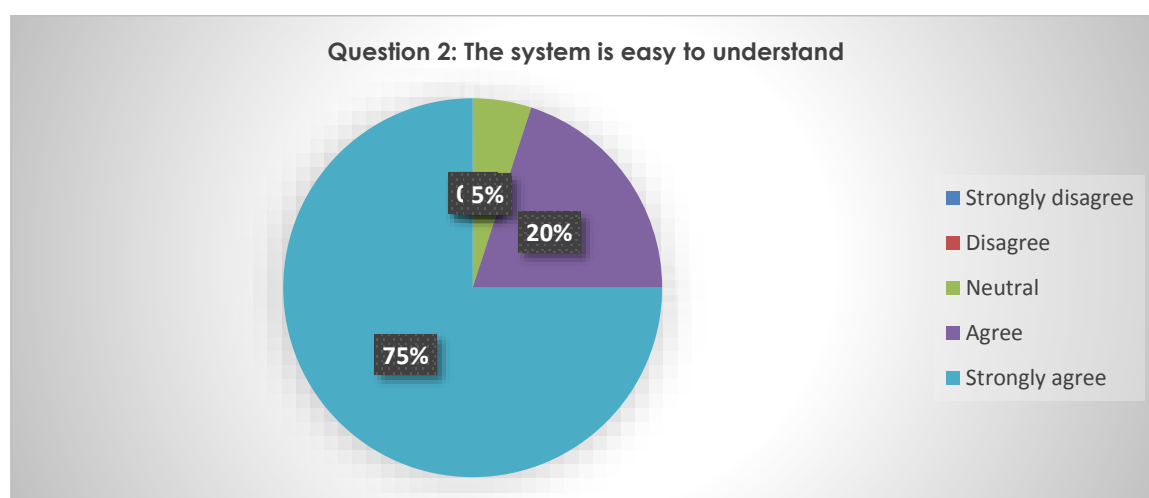


Figure 6 : Result Q2

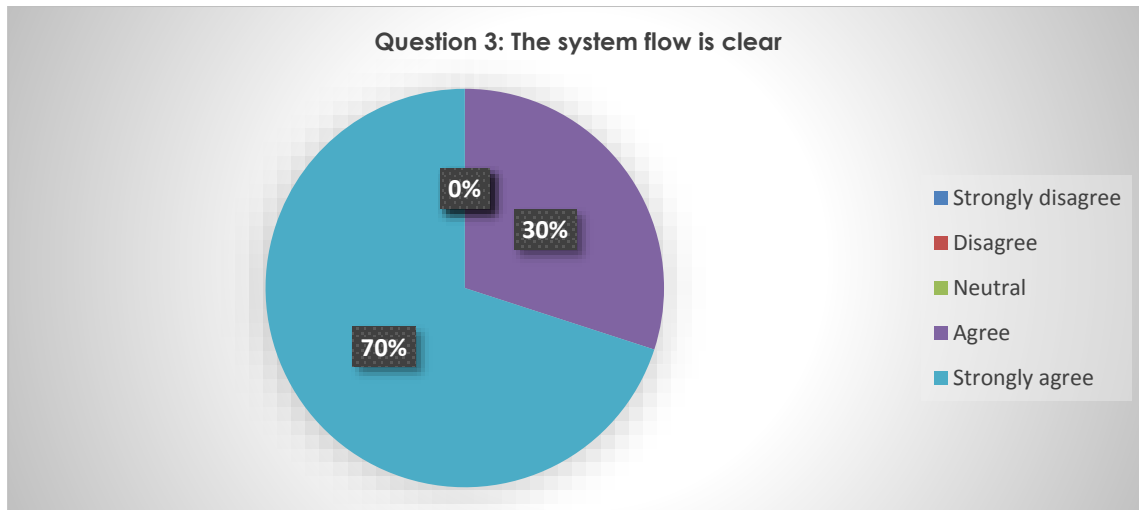


Figure 7 : Result Q3

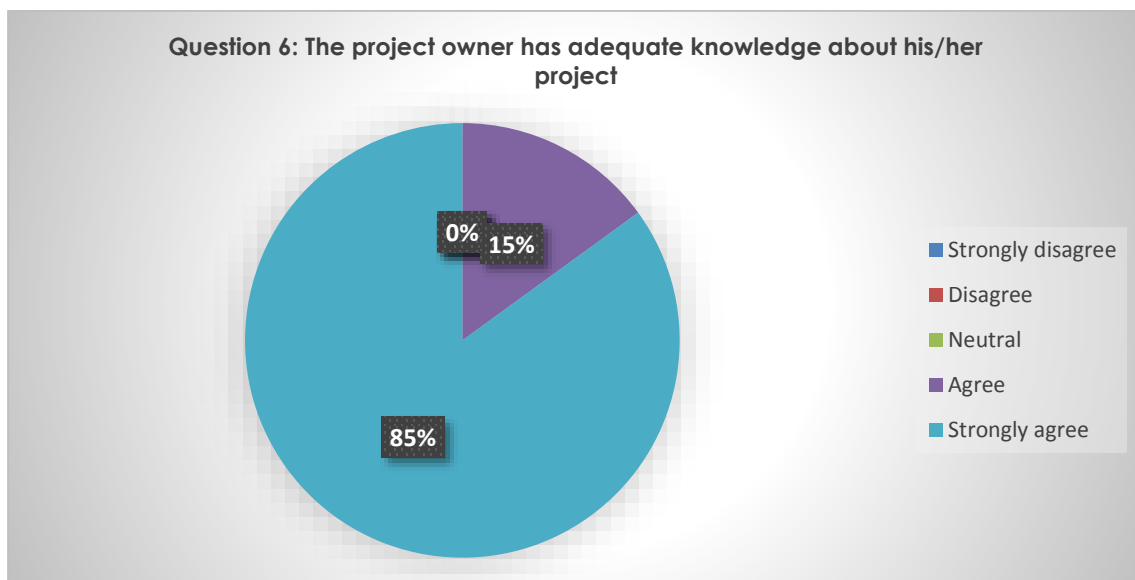


Figure 8 : Result Q6

80% of the respondents strongly agree that this system is attractive and well-designed whereas another 20% also agreed to that question. 75% of the respondents strongly agree that this system is easy to understand.

70% of the respondents strongly agree that this system flow is clear while 30% of them agree with it. 85% of the respondents strongly agree that the project owner has adequate knowledge about her project while 15% of them agree with it

Overall results shown satisfaction on the system made for the customer based on the sample questionnaire results.

Advantages of System

This system able to help reduce teacher's workload once the questions database has been setup. It helps student to explore more on the subject wise. This system able the students to answer the exercise questions using the online system

This system generate questions randomly so that the students do not answer the same questions. Using this system, auto marking is implemented where the answers will be marked automatically.



Parents will get a notification for every exercise that have been done. Education system is adapting itself with the rapid development of technology. Therefore, the traditional method need to combine with other way of teaching,

It helps to make and help parents and schools administration get involve in the education of the younger generation. Automation of difficult tasks are much needed in the education system and community as there are many jobs await teachers and school administration as the syllabus keep on changing and new things are added.

Important to Education

The prototype system built for this project is important to educate the user on the use of technology with or in or outside of classroom. It also helps reduce teacher's workload and they can concentrate more on delivering other teaching materials and tasks.

It also helps educate parents to monitor their children's progress. Children's are also introduce to another way of learning and use of technology in their learning process. It helps to let them manage their study time.

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ID NO. UNIKL 004	TOPIC: MOBILE EDUCATIONAL PENTEST

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The increase in demands for security professionals, has led to many offering for Information Security programs in Malaysia Higher Learning Institutions. Information Security courses is a difficult course to teach, as such an innovative approach to relay the course to student and to engage with them is important. The authors introduce the approach of introducing penetration testing using mobile application to enhance students understanding and allow the freedom of mobility to practice their understanding of the said course. The tool produced is an approach to engagingly interact with their security undergraduates and at the same time proposing innovative way of teaching course as difficult as penetration testing related topics. Interactive educational mobile penetration test is an android application targeted for undergraduate student to perform penetration testing with guidance in a form of short descriptive manual. At the end of the learning session student will be given a test as to enhance their understanding of the penetration test conducted. This application is suitable to be use in education and guide its user to perform penetration testing ethically which is previously mostly executed on personal computers.

Table 1: Penetration Testing Functionalities

Functionality	Result	Conclusion
Service Inspector	Analyzed the target OS fingerprint	The result is enumerating the target OS and service.
Kill Connection	Performed an IP Address spoofing on the target	Target unable to access the DNS server.
Javascript Injection	Executed and injected alert XSS on the target browser	Vulnerable target prompted with pop-up alert on the browser.
Replace Image	Executed and replaced image on the target browser	The target browser displayed with new image.

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ID NO. UNIMAP 001	TOPIC: Unpacking the Potential of Web 2.0 Tools for Developing Culture of Thinking in Statistics Classroom

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Abstract: One of the arguments in statistics education was the traditional teaching approaches that focus on computations and procedural skills did not lead to students' reason and think statistically. In addition, the direct instructions in traditional statistics classroom did not foster active learning. Therefore, there is a need to design interactive classroom that promotes development of deep learning and opportunities for students to effectively engage with reasoning and thinking process. To move away from the traditional approach and emphasize on students' ability to reason and think with statistical information have open-up possibility of integrating technology within content instructions. In this project, four Web 2.0 Applications were applied to introductory statistics class for engineering students at Universiti Malaysia Perlis. The classroom instructions were carefully designed to enrich students' learning experiences and at the same time to achieve the learning outcomes with the support of these four tools. These blended learning instructional designs are given as in Table 1.

Table 1: Applications of blended learning in statistics classroom.

Web 2.0	Types of Usage and Advantages
	Upload files, videos, student's homework, think-pair-share thinking routine activity, make announcement, post learning outcomes notes. Easy access through mobile phone. Enable communication inside and outside of classroom.
	Usually used at the begining of the class to evaluate conceptual understanding and encourage discussion. It is useful for students to reflect upon the materials and adjust the learning accordingly.
	Provide questions for self-assessment on certain topic before conducting formal formative assessment.
	Excellent tool for making students' thinking visible. Allows interactions and encourage peer-to-peer learning. Introvert students found that this approached build-up their confidence.

These blended learning strategies open-up the avenue to culture of thinking (CoT) classroom. To reason and think statistically, students need to demonstrate strong conceptual understanding. Therefore, establishing CoT classroom facilitated by technology provides environment where students' thinking are visible, promoted and valued. The 21st century learner requires diverse instructional strategies that facilitate development of content knowledge constructively and foster deeper understanding. The interactive learning space, students' voices be heard and highly engagement with students' thinking empower and prepare students toward self-directed and self-regulated learner.



Key words: statistical reasoning, statistical thinking, higher-order thinking, constructivist learning, technology-enhanced learning.

Acknowledgement

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ID NO. UNIMAP 002	TOPIC: IHL 1ST Year UniMAP Students Experiences With Technology : Are They Really Digital Native ?

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Abstract:

Digital native describes as individuals who are born in the digital age without requiring to adopt technology during adulthood (digital immigrant) as internet technology becomes a common commodity (Alias, 2018). Therefore, this research aims to study the readiness of first-year diploma UniMAP student in adopting to technology usage in learning and education. The results obtained in this bear similar results as study done by Linda (2016) and Kennedy, Judd, Churward and Gray (2008), where they found that increase access to multiple forms of technology will have a higher likelihood to be more agreeable to technology used in education. This is because through the results obtained there is significant interaction between access to technology tools (mobile phones, laptop and etc.) and exposure to web services (twitter, skype and etc.) with agreeableness of student to use technology tools. Moreover, the study also found that there is a significant difference between mobile phone and laptop use in utilizing technology (which mobile phones seems to have a higher mean than laptop). However, despite the differences in frequency student's still view laptop as the main tool to access web technology than a mobile phone. Henceforth the data justifies the government's initiative for an Industrial Revolution 4.0 (IR 4.0) in education as it is possible with the amount of access that most first-year diploma student have in UniMAP.

Key words: Desktop, Mobile phone, Learning Technology Tools, e-Learning, I.R 4.0

Content

Research Objective:

- To study the relationship of mobile phone usage with frequency web base technology usage.
- To investigate the relationship of laptop usage with frequency of web base technology usage.
- To understand whether there is a difference in frequency of usage computer and mobile phone base technology.
- To find the agreeableness of student to technology assist teaching tools is determined by exposure to web services and access to technology.

Value Added:

- Validation the requirement to shift in to a more blended learning alignment in class.
- Improve understanding on preferable choice of engagement for student using mode of technology access.
- Understanding the shift of learning to further improve alignment towards Industrial Revolution 4.0.
- Justifies the needs for educators to hone their skill in order to be more technologically align in class.
- Provides a better solution to implement Technical Vocational Education Training with technology.

Usefulness:

- For students this study will be able to help them to have an interaction and learning through mode of technology preferred.
- For lecturers it will help them to be more aware of the possibilities of implementing technology and web driven learning and teaching into their syllabus.
- For companies they will be able to get graduates that are technology driven and competent due to students being exposed to knowledge management system earlier on in their education.
- For the government this study justifies the means that the direction for an Industrial Revolution 4.0 in education is a solid proposition to a more holistic individual in a nation.

Table 1: Access to tech tools

Frequency of Laptop Access					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not sure	6	6.6	6.6	6.6
	no access	18	19.8	19.8	26.4
	limited access	30	33.0	33.0	59.3
	unrestricted	37	40.7	40.7	100.0
	Total	91	100.0	100.0	

Frequency of Mobile Phone Access					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no access	4	4.4	4.4	4.4
	limited access	30	33.0	33.0	37.4
	unrestricted	57	62.6	62.6	100.0
	Total	91	100.0	100.0	

 Frequency of Desktop Access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not sure	3	3.3	3.3	3.3
	no access	18	19.8	19.8	23.1
	limited access	40	44.0	44.0	67.0
	unrestricted	30	33.0	33.0	100.0
	Total	91	100.0	100.0	

 Frequency of Internet Access

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not used	7	7.7	7.7	7.7
	over monthly	16	17.6	17.6	25.3
	monthly	31	34.1	34.1	59.3
	weekly	23	25.3	25.3	84.6
	daily	14	15.4	15.4	100.0
	Total	91	100.0	100.0	

 Nonparametric Measure Test Repeated

Test Statistics^a

N	91
Chi-Square	10.000
Df	1
Asymp. Sig.	.002

a. Friedman Test

The nonparametric results obtained Friedman's test shows that there was significant different between the mean score of computer and mobile phone usage.

Nonparametric correlation						
		Correlations				
		T5TOTAL	T4TOTAL	T3TOTAL	T2TOTAL	T1TOTAL
T5TOTAL	Correlation Coefficient	1.000	.399**	.384**	.190	.367**
	Sig. (2-tailed)	.	.000	.000	.071	.000
	N	91	91	91	91	91
T4TOTAL	Correlation Coefficient	.399**	1.000	.521**	.647**	.367**
	Sig. (2-tailed)	.000	.	.000	.000	.000
	N	91	91	91	91	91
T3TOTAL	Correlation Coefficient	.384**	.521**	1.000	.296**	.243*
	Sig. (2-tailed)	.000	.000	.	.004	.020
	N	91	91	91	91	91
T2TOTAL	Correlation Coefficient	.190	.647**	.296**	1.000	.418**
	Sig. (2-tailed)	.071	.000	.004	.	.000
	N	91	91	91	91	91
T1TOTAL	Correlation Coefficient	.367**	.367**	.243*	.418**	1.000
	Sig. (2-tailed)	.000	.000	.020	.000	.
	N	91	91	91	91	91

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The Spearman's Rho result shows that there is a significant and moderate correlation between mobile phone usage with student usage of web technology. Other than that, the study also finds that there is a strong and significant correlation between computer usage and the usage of web-based technologies. This signifies the higher the usage of laptop the more likely there is for student to use web services.

Regression					
		Unstandardized Coefficients		Standardized Coefficients	
Model		B	Std. Error	Beta	t
1	(Constant)	36.895	2.801		13.171
	T1TOTAL	.494	.118	.404	4.172
2	(Constant)	34.460	2.894		11.908
	T1TOTAL	.375	.125	.307	3.001
	T4TOTAL	.077	.031	.254	2.485

a. Dependent Variable: T5TOTAL

The regression analysis shows interaction of access and web usage (web) with agreeableness where the results is $Agreeableness = 34.460 + .375(Access) + 0.077(Web)$ has a significant interaction with a acceptable moderate correlation.

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ID NO. UNISZA 001	TOPIC: MOBILE SMART PHONE APPLICATION FOR FAHAM FIQH AL-AQSA(AFAQ)

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Abstract:

M-learning is one of the learning approaches that combines the use of mobile devices with educational materials. It is part of an e-learning approach, which provides the widest opportunity to learn without limiting access to information. Faham Fiqh al-Aqsa(AFAQ) is an android mobile smartphone app that is characterized by utilitarian and user-friendly. The AFAQ developed aims to provide easy and appropriate references pertaining to key information about the al-Aqsa Mosque and Baitul Maqdis to Muslims. In addition, it also aims to raise public awareness on the importance and the duty of defending the third major mosque in Islam; the al-Aqsa Mosque and its location, Baitul Maqdis which is the first Muslim qibla. The Application of Faham Fiqh al-Aqsa (FAQ) is using the ADDIE model. The ADDIE model is a systematic direction in model design. ADDIE stands for A (Analysis - analysis), D (Design - Design), D (Development - Development), I (Implementation - Implementation) and E (Evaluation - Assessment). Therefore, there are 5 phases in the construction of a model using ADDIE. However, the AFAQ development only go through 3 phases, namely analysis, design and development. AFAQ is developed using tri-languages, namely: Malay, Arabic and English. The existence of the AFAQ app is expected to fill in the latest medium for accurate information relating to the al-Aqsa Mosque and Baitul Maqdis that every Muslim needs to know.

Key words: *Fiqh al-Aqsa, al-Aqsa Mosque, Baitul Maqdis, M-learning, Islamicjerusalem, Smart phone Application*

Content

AFAQ is developed with user-friendly features, with a simple interface display, consisting of INFO FAQ buttons, language selection buttons and LOGIN buttons. The user just needs to press the LOG button, and then select the desired buttons that consist of Discussion FAQs, Alerts, Landmarks, Games, INFO FAQ and FAQ channels. The user will directly linked to the required videos which are divided by the main topics.



Advantages

The users do not need to download the videos they want to watch as they are linked directly to the link you tube for each topic. Similarly with the game button and other buttons, the user will also be connected to the corresponding link directly.

Acknowledgement

Special thanks to the Center for Research & Innovation Management (RMIC) for the funding of the development of the Faham Fiqh al-Aqsa Mobile Android Smartphone Application through the University Research Fund (UNISZA / 2017 / DPU / 27)

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ID NO. UNISZA 002	TOPIC: The Era of Artificial Intelligence in Malaysian Higher Education: <i>Three Minutes Exploration (3ME) with Flexible Approach Path (FAP) for Effective Learning Process in Self Exploration Education System (SEES)</i>

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Abstract: Artificial Intelligence (AI) is the creation of a smart machine that has human behavior and response. AI in the education sector is able to interact, assist, and guide students through Self-Exploration Education (SEE), such as current, but semi-automatic learning systems. Everyone is born as a genius, with curiosity to explore the environment through experiments. However, in practice, SEE is still very much focused on spreading facts rather than encouraging personal exploration. Conducting exploration of learning in the classroom can be complicated for adult learning or andragogy and is limited by virtue, money and work infrastructure. But what if we can create a middle ground between learning and fiction, the world in which adults learn and explore in ways that may be impossible in real life but still true to the transfer of knowledge? The project is to craft an imaginative and accessible tool to help adults develop scientific minds and practices through self-exploration or Do-it-yourself DIY with a mixed reality learning system that empowers adults to know the invisible and investigate hard through exploration. The system combines exploration and engagement technology with various traditional AV Audio mechanisms from flip cards, books and CDs to bring the living world. In such a way, adults can interact with real materials, books, to unlock tremendous virtual phenomena. They can discover things that are invisible to the naked eye through metaphorical materials. And they can also carry out experiments that are impossible in reality by creating their own universe and controlling parameters in the simulation. And the lively interaction raises their interest and enthusiasm for more technical exploration.

Key words: *Artificial Intelligence, Flexible Approach Paths FAP; Tangible Mixed-Reality Learning; Self Exploration Education System SEES.*

Introduction

Humans are born with different characteristics. They have their own preferences when conducting their life. Similarly, in learning, humans have difference styles to construct new knowledge and skills. Some prefer reading books whereas others prefer listening or doing it by themselves.

Every people are born as a genius, with curiosity to explore the environment through experimentation. In fact, Self Exploration Education System (SEES) still intensely emphasizes on transmitting facts instead of boosting personal exploration. Conducting learning exploration in a teaching space can be complicated for adult learning or andragogy and limited by welfare, money and workshop infrastructure.

The Flexible Approach or modular teaching is part of teaching strategies [6]. It has been used extensively in the development of self-learning materials or modules for learners in Open and Distance Learning (ODL) [12].

The word "Modular" refers to learning packages consisting of separate parts or units or small chunks which can be put together to form sets of instructional materials.

In this part, the study is going to focus on the Flexible Approach in the teaching-learning process. It is applicable to all teaching-learning situations without being merely restricted to self-instruction or distance learning.

The Modular Approach to teaching and learning is a process in which you take a large topic/educational task and break it down into smaller parts (also known as chunks) with each smaller part being addressed individually.

As a lecturer, he or she may view the Flexible Approach as the packaging of small units of a lesson into structured and interactive learner-centered materials which can be used for the students' learning at their own pace or via guided face-to-face learning. Teachers may have come across some features of Flexible Approaches in courses or learning sessions that they have attended.

A typical feature of the Flexible Approach for SEES can start with a preface for the unit, the unit learning outcomes, followed by contents which comprise texts, learning activities, formative and summative assessments, feedback to assessments and ending with a summary of the unit.

The main idea behind the Modular Approach is to divide into segments or chunks (divide into smaller portions) the instructional events into some logical sequence that will facilitate the learning process. These features presented in sequence will lead the learner towards achieving the stated learning outcomes.

DIY Learning – what is it?

The ninth Shift of the Malaysia Education Blueprint 2015-2025 (Higher Education) targets Malaysia's higher education institutions to be significant players in the Globalised Online Learning (GOL) field. The GOL focuses on putting Malaysia in a good position to harness the power of online learning, enhancing the quality teaching and learning, lowering the cost of delivery and bringing Malaysian expertise to the global community. However, the major barriers to achieve GOL are lack of personal experience on online learning among the online learning users; and on the preparation of materials and methods to support the online learning.

As Do It Yourself (DIY) learners, students take 75% practice control of their own learning and decide what courses and skills they want to learn [5][13] (see Fig. 1). The availability of relatively inexpensive online courses through sites like e-Learning Project (KeLIP-UniSZA) helps make it easy for DIY-ers to explore new knowledge areas without the expense of a traditional learning course.

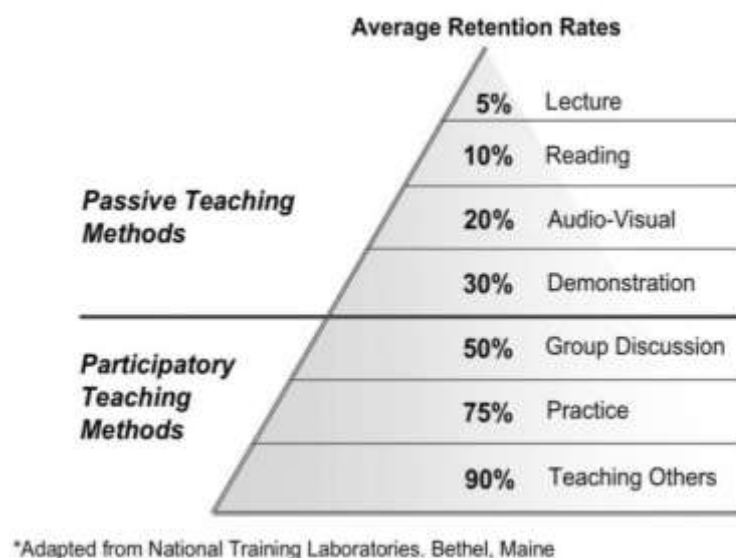


Fig.1: Average Retention Rates of Learning

Many respected primary, secondary and university level, offer Massive Open Online Course (MOOCs) and Udemy.com for free as a way of promoting democratic education and bringing new learning opportunities to the public. These noncredit courses can be found in subjects ranging from computer programming to ancient civilizations, and they are typically a risk-free way to try out a prospective major, develop new skills, or simply expand your general knowledge.

Another feature of the DIY Learning community is hackerspaces: open workspaces where hackers and makers can come together to learn and collaborate, typically in fields like science and technology. Hackerspaces may offer knowledge sharing, social activities, and group projects, much like a more traditional learning environment. The difference is, hackers and makers decide what projects and initiatives are meaningful to them, determining their own curriculum. This is not unlike flipped classrooms, a new approach to education that allows students to guide themselves.

Who is it for?

The best part of DIY learning is that almost anyone can benefit from it. For some trainees, self-directed learning is an alternative to a formal Learning at any an institution or learning center [11]. For others, it is a way to give learning courses a try and see if a particular skill or discipline is for them. Still, others may choose to take self-directed learning initiatives after learning at the learning institution in order to develop new professional skills or simply to enrich their lives [11].

Pursue only what students' want and need to know. Through FlexiMode, a learner can choose the Learning that directly applies to his/her personal interests and professional goals. If funding traditional institution Learning is not an option, DIY Learning may offer a free or relatively low-cost way to enhance one's skills. DIY learning lets trainees take a stand against the commercialization of learning. DIY movements of MOOC



project encourage students to think independently and to rebel against the influence of government or corporate agendas on education.

In some cases, online learning programs can offer the best of both worlds, blending the tried-and-true syllabuses and resources of a learning institution with the DIY flexibility of learning at whatever time and place was chosen. Whatever stand one may take, it is impossible to deny that DIY learning has led to increased accessibility for learners, innovation in course delivery, and a new world of possibilities for independent learners.

However, DIY learning typically does not culminate in a grade, which is a necessary credential for many career paths employers require some sort of formal learning certificate. Self-directed Learning is not applicable to every profession [11]. While many computer programmers may be DIY-ers, it is unlikely to find a self-taught neurosurgeon. A DIY learning requires a great deal of independence and personal drive. A trainee will need to be familiar enough with their chosen discipline to plan and carry out their own course of study, and they will need to hold themselves accountable for reaching the goals they have set.

Self-directed trainees do not have ready access to trainers, tutors, professors, and counselors. While support for DIY-ers is available, a trainee will have to work harder to find a group of knowledgeable peers and mentors to help them.

What is andragogy?

Andragogy is the art and science of teaching adult learners. Adult learners have multiple roles which include roles as spouse, parents, employees and members of the society [10]. They possess positive self-concept and are capable of making a decision and being responsible for their own choices. They are also rich in experience and able to relate old experiences with new ones. Andragogy takes into account that adult is self-directing and take responsibility for their own decisions [8] (See Fig. 2). The fundamental concepts of learning involving andragogy are that adults:

- Need to know why they need to learn something.
- Need to learn experientially.
- Approach learning as problem-solving.
- Learn best when the topic is of immediate value.

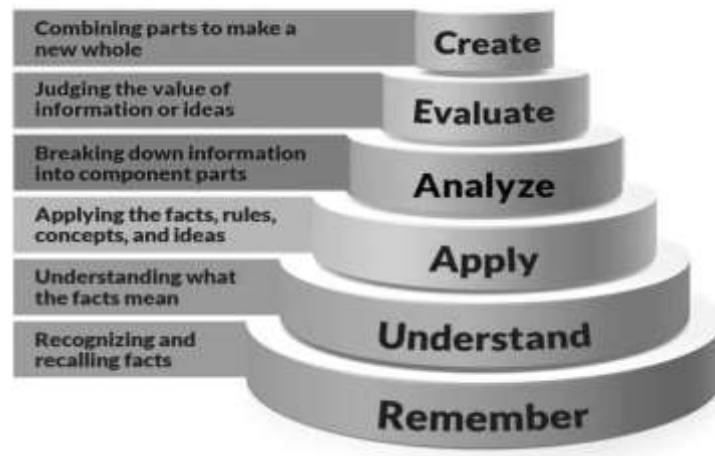


Fig.2: Level of Taxonomy Bloom

Methodology

Choosing the correct methodology and methods is the first step and the key in relation to project procedure. In the context of this approach, the application development platform is firstly determined and one suitable development model is chosen. Object oriented programming and modularized programming are adopted in this project. After testing the application, it is evaluated according to its user-friendliness.

Selection of development platform

In relation to the popularity and availability of the user end application, a suitable platform was chosen. Based on the years of efforts by our project team, the system has been successfully established on a PC platform. The new requirement is its establishment on mobile devices such as smart phones and tablet PCs. Currently, the most popular operating systems on mobile devices are Android, iOS, and Windows phone. A software stack is adopted in the Android platform with Linux core providing the basic functions and various programmers developing diverse applications [7]. Openness, independence from a service provider, abundant hardware options, no developer restriction, and supporting Google Play are the notable advantages of the Android platform over any of the other available options. Android allows any mobile end manufacturers to join the developing platform, which leads to the diversity of novel applications. This also gathers a wide user base for itself. The internet service is not restricted to the Android platform and the choice of hardware is also significantly plentiful. Manufacturers promote all sorts of products with different features and specialities, but this does not affect the compatibility of software or the data synchronism. Choosing the Android platform minimizes the problems that occur in the programming process, simplifies the developing procedure, and lays the foundation for future popularity of the user end application [3].

Selection of development model

Over the years, a large diversity of application development models, such as agile methodology, waterfall methodology, extreme programming, and rapid action development have taken shape. While each model has its own advantages and disadvantages, based on the requirements, scale, and urgency of

different mobile application development projects, particular models are able to be applied. For example, as for agile methodology, the whole development procedure is divided into several parts. This approach makes it easy to alter the project and reduces the overall risk in relation to the whole project. The waterfall model is best suited to steady and static projects for which the main emphasis is in relation to schedule planning and for which there are no significant changes throughout the entire process. If the application requires a quick delivery, the best choice is rapid action from the developer.

This project is a function-oriented application development aimed to realize an Android application with concrete functions [9]. Hence, the waterfall model is adopted in this project. The project starts with the gathering of related information and background searching. Once the general goal has been settled upon, the move is then towards schedule planning after which the whole project course is completed step-by-step. This model diagram can be seen in Fig. 3.

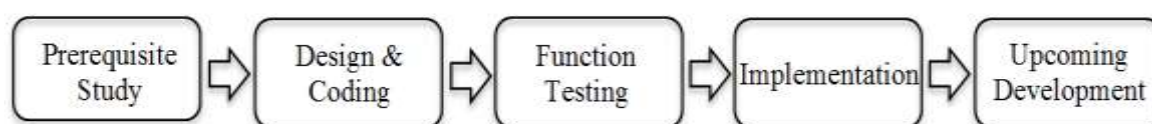


Fig. 3: Waterfall Methodology Model Diagram

Before the design and implementation are initiated, it is important to have knowledge on the background and the current situation for the Flexible Approach Paths. This information is gained by reading the previously reported paper regarding the Modular Approach in the team, as well as studying the paperwork of other Flexible learning systems.

To accomplish this task, the first aspect to be considered is the required functions. The user population of this application is the app users, who require FAP and learning information data. Without a doubt, a great deal of effort is required to be put into the data interaction. The data from the FAP do not come directly from the database. Firstly, the developers upload different data to the server, which would process and save the data. When the user clicks into the application, it will send a requirement to the server for data and information. The remainder of the process is displaying the data in a user-friendly manner. However, it is not sufficient for the user end to merely possess this function. This application should also enable interaction to take place between the users and FAP. As the function of this application is now clarified, the realization of the application is based on these functions.

In relation to the popularity and availability of the user end application, a suitable platform was chosen. Based on the years of efforts by our project team, the system has been successfully established on a PC platform. The new requirement is its establishment on mobile devices such as smartphones and tablet PCs. Currently, the most popular operating systems on mobile devices are Android, iOS, and Windows phone. In this project, the Android platform was been chosen due to the dominances described earlier.

Advantages of Flexible Approach Learning

The Flexible Approach Learning ensures lectures/learning sessions are delivered accordingly without the presence or lectures/trainers, in conventional lectures/learning, classes/learning are postponing when the lecturers/trainers are away on official business or due to some personal reason.

Attending hundreds of students in a class that comes from various academic and knowledge background is the most wearisome situation for many lecturers or trainers. Lecturers have to deliver the subject and ensure a bulky syllabus is finished. The lecturers may be delivered at a faster pace, causing some students unable to catch-up the lectures. By using Flexible Approach Learning, they can revise the subject independently. Topics from previous semester can also be browsed, hence, refresh student's knowledge.

Theory of the Flexible Approach: Learning Theories

What is a learning theory? A learning theory describes how your students learn and describe their actions and behaviour when they learned. Basically, there are five common learning theories:

- Behaviorists – explains learning as a change in behavior.
- Cognitivist – explains learning as an internal mental process. (processing of information, memory, and perception)
- Humanist – explains learning as a personal act to fulfill potential.
- Constructivist – views learning as a construction of knowledge and meaning through experience.
- Social Constructivist – explains learning as a process of interaction with and observation of others in a social context.

(Some description of each learning theory is in order as we cannot presume familiarity).

Relevant Learning Theories of Flexible Approach

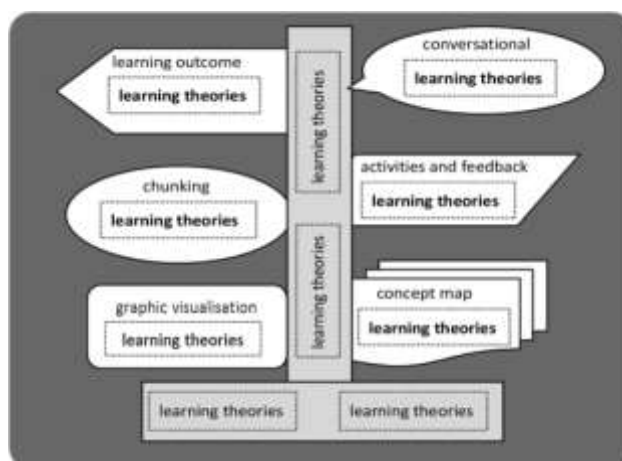


Fig. 4: Learning Theories and the Flexible Approach

Fig. 4 shows the learning theories from which the characteristic features and structure of the Flexible Approach are derived. These theories form the skeletal backbone and the foundational learning principles of the approach [14].



Fig. 5: Flow of Flexible Approach Paths

The Flexible Approach Path can help solve these very typical problems. What if, based on years of learning experience, trainees can already predict some of the potential problem areas in the course that they are going to impart [11] (See Fig. 5). Table 1 shows the Flexible Approach Paths (FAP) consist of 39 attributes coming from six (6) dimensions for trainers to refer for developing and designing their Learning programme [11].

INVENTION	RECOMMENDATION	EXPLANATION	DEMONSTRATION	UNDERSTANDING	RECALL
Creation	Reference	Clarification	Illustration	Considerate	Memory
Discovery	Endorsement	Description	Design	Explanation	Recollection
Development	Approval	Elucidation	Drawing	Clarification	Remembrance
Origination	Sanction	Account	Sketch	Description	Reminiscence
Brainchild	Blessing	Enlightenment	Image	Elucidation	Remember
Device		Reason	Examination	Enlightenment	Evoke
Innovation		Justification	Consideration	Justification	

Table 1: The 39 Attributes of the Flexible Approach Paths

Practicality and Usefulness of FAP for Effective Learning Process of SEES

The aim is not only to gain insight into how the Flexible Approach evaluates new potential markets, but also to understand how lectures/trainers make sense of, and prioritize, the immense amount of information available. The Flexible Approach Framework will be proposed for Officers, Schools, Colleges Universities and realized by many organizations/institutions and can be further expanded to all field of Learning and Development (T&D). In this project, the criteria used to determine the attractiveness of a market differ widely. It is importance upon stating that “the linkage between market attractiveness and business success is widely recognized”. It can be implied market attractiveness refers to the characteristics and attributes of

the market itself. Usually, the criteria used to decide attractiveness depends on the business activity in question. Below follows a presentation of the criteria of which is perceived to be most commonly used for assessing the attractiveness of a market.

The most common way to decide the attractiveness is a usage of performance measures such as market size. For this project, the attractiveness of a market is highly influenced by the market size. The market size is as being one of four factors deciding the attractiveness of a market. The level of attractiveness is by the project managers decided, partly, by looking at the market's size. The underlying metrics used to determine market size vary, but some frequently used indicators include, population size, a total value of sales, and urban population. The market size and market growth are seen as the most commonly used screening criteria.

This is also a common way to decide the attractiveness of the project. The market growth as a variable included in several different approaches to Malaysian market selection embraced in reality. The market growth is a factor "considered to be important in assessing the potential attractiveness of a local market".

As is the case with market size and market growth, many researchers argue capital is a criterion of which needs to be evaluated. The income is the level to a large extent influence the attractiveness of a market for T&D. It can be stated by project managers to evaluate a market's capital when evaluating markets in reality.

When entering a local market, the perceived risk associated with a market must be considered by project managers. With this, the risks might diminish a firm's interest to invest in a market. The risk involved in the particular markets is a factor project managers consider when evaluating different alternatives. The risk might be of a political, technological, cultural or economic nature and concerns the environment of the market.

Consumer characteristics are further believed to play a role in the Malaysian market selection since a match between the firm's offering and consumers' attitudes and values are crucial for success. The firms which target consumer markets whole competitiveness culminate in a deep understanding of the consumers. Ultimately, a successful establishment in a new market comes down to satisfying consumers' needs and wants, making it reasonable to believe decision-makers investigate this in order to gain insight whether or not the firm can satisfy the consumers.

A consumer characteristic is a broad term including many different variables. The homogeneity as one of the main points when segmenting markets, as the needs of a heterogeneous segment might widely differ, this is leaving many consumers dissatisfied. We are of the impression it is not appropriate to define what consumer characteristics are since it might differ what individuals interpret consumer characteristics as.

The infrastructure and population density affect the economic attractiveness of the market. An attractive market has an unsatisfied need for the product from the consumers.

The first formation Learning concept and the application of this approach in Learning and development program is relatively new in Malaysia. It is also the first interactive for End-user (Do-it-yourself) to increase proficiency and mastery in English Learning practice for non-English speakers in Malaysia. There will be a significant migration from conventional education resources e.g.; books, posters, flips cards to portable electronic devices.

Learning and Development (T&D) process takes a large topic task and breaks it down into smaller parts (also known as chunks) with each smaller part being addressed individually. The interactivity will be captured the attention and promotes the sustainability of information. While the animation stimulates interest and inquisitiveness of the users. Portability and flexibility permit self-directed learning and allows information updating from time to time. The Android-Based Operating System supported by most mobile devices/gadgets.

The Flexible Approach was pre-tested for the simulation process with the professional communication T&D and the IP was registered with Research Management Centre of the university. In-house knowledge sharing is growing in popularity as a mean to continuously disseminate knowledge and share best practices for contributing to the community.

Conclusion

The Flexible Approach or Flexible teaching has been part of teaching strategies for quite some time, but the application of this approach in Learning and development program is relatively new [1]. The objective of this study is to develop a Flexible Approach for effective English Learning practice for non-English speakers. The Flexible Approach is actually being used extensively in the development of self-Learning materials or modules for trainees in the Learning and Development program (T&D) but yet to be applied in teaching. The word "Flexible" refers to Flexible Learning that can occur anywhere, anyhow, anyway [15]. However, flexible Learning in itself is complex and not as simple as this definition implies. The interaction of four components - technology, andragogy, implementation strategies and organisational framework - can lead to learner-centered experiences when they are well integrated [4]. FlexiMode for English Language Learning is a Flexible Approach for Effective English Learning Practice designed by Faculty of Applied Social Sciences UniSZA and School of Social and Economic Development UMT is able to ensure students/trainers to understand, speak and learn correct English at anywhere confidently. Simple requirements are devoted some hours every day, as per your convenience, in surrounding your quiet home & soon you will be a master of English.

Acknowledgment

Faculty of Applied Social Sciences, Universiti Sultan Zainal Abidin (UniSZA), Kuala Terengganu, MALAYSIA. And, School of Social and Economic Development (UMT), Kuala Terengganu, MALAYSIA.

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ID NO. UNISZA 003	TOPIC: A Quick and Practical Electronic Mental Assessment and Self-Treatment System (e-MAST) using Rule-Based Technique

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Abstract: Every year, over one million people died by suicide worldwide. 6.7% of them are due to depression. These incidences are preceded by life stresses and progresses into further mental health difficulties and possible mental disorders. High depression, anxiety and stress are common prevalent mental health problems. They are less visible and gradually eroding people's life into other domains of life. Early recognition and detection will allow better understanding and intervention to prevent further deterioration into mental disorders as well as disastrous complication. Therefore, this study develops a quick and practical electronic self-assessment and coping guide called electronic Mental Assessment and Self-Treatment System e-MAST for universities' students. This system offers students with a set of questionnaires measuring current stress, anxiety and depressive symptoms generated using rule-based techniques. It also explores possible life stress domains and the students are advised on the self-treatment techniques while awaiting professional helps. In addition, this system can be used at all times and anywhere.

Key words: *Mental Assessment, Self-Treatment, Rule-Based Technique*

Introduction

A mental disorder is a health problem that significantly affects how a person feels, thinks, behaves, and interacts with other people (www.health.gov.au/mentalhealth, 2017). Besides, can be characterized by the absence of positive effect (a loss of interest and enjoyment in ordinary things and experiences), persistent low mood, and a range of associated emotional, cognitive, physical, and behavioural symptoms (National Institute for Health and Clinical Excellence, 2009). About 450 million people suffer from mental disorders worldwide. One person in four will develop one or more of these disorders during lifetime (WHO, 2004). Other research findings indicate that about one in five Australians aged 16-85 years experiences a mental disorder at some time in their lives (www.wiley.com, 2017). One in four Europeans report they have suffered from at least one mental disorder during their lifetime (Alonso et al., 2004). In the USA 26.2% of the population, 60 million people, suffer from at least one form of mental disorder [6]. Mental disorders represent not only an immense psychological, social and economic burden to society, but also increase the risk of physically illnesses (WHO, 2004).

In light of that, there is a need to a system that can diagnose early mental disorders problem and self-stress treatment. Besides, can initiate public awareness of the mental disorders problem. In 2010, Kroenke et al. (2010), proposed a review on patient health questionnaire somatic, anxiety, and depressive symptom scale. Besides, Richardson et al., (2010) evaluated the patient health questionnaire of 9 items for detecting major depression among adolescents. Donker et al., (2013) reviewed the use of mobile phone applications (apps) provides the opportunity to increase accessed to the evidence-based mental health care. Bakker et al., (2016) reviewed and recommended an evidence-based for future developments of mental health smartphone apps. Based on the previous studies, many currently available mental disorder applications (apps) are focused only on the mental disorder problems and lacked with the features of stress self-treatment and detecting factors that contributed to metal disorders. Besides, lack with a complete system due to the trial-based evidence only (Bakker et al., 2010).

Thus, the proposed of this study is to develop a Mental Health Diagnosis and Stress Self Treatment system which is a free apps. This system covers the functionality on level of stress, anxiety and depression of the user based on the set of questions via rule-based techniques. Besides, it provides a self-treatment

to the users based on the level of mental healthiness via weighted sum method by suggesting some activities and advises to the users. This system also detects factors that contributed to the level of stress, depression and anxiety. Besides, provides some suggestions on the mental health treatment from a qualified doctor and a chatting space to communicate personally with the doctor.

Content

This section focuses on constructing the mental assessment and stress self-treatment system. It includes design of the system, planning, implementation and achievement of the system.



Figure 1: The flow of system construction

The development of this system starts with the **initial planning**, where all the activities are planned according to the given period to complete the system. Next, the analysis of user and system requirement are identified in the **requirement phase**.

Then, **analyse and design phase** focuses the system to develop a prototype based on the functionalities once the requirement phase is completed. The rule-based technique is applied in this phase. The knowledge on mental disorders are collected based on previous study by McShane and Glinow (2016) and transformed into the rules based in a form IF-THEN rules. Rules are made to be accurate by getting assistance from the medical experts. Then, all rules are changed into the coding using some programming tools. The general IF-THEN rules is stated as follows;

$$\text{IF } x_i \text{ is } F_i \text{ and } x_j \text{ is } F_j \text{ THEN } I_r$$

The rules are usually expressed in two parts which is IF part called antecedent or premise (or condition) and the THEN part is called consequent or conclusion (or action) (Li et al., 2012). If the rules is of multiple structure (usually combination of rules using AND and OR operator), it can decomposed into much simple rules (Shanliang et al., 2013). Example of simple and multiple rules are as follows:

- IF condition THEN action
- IF condition 1 OR condition 2.. OR condition N THEN action
- IF condition 1 AND a condition 2.. AND condition N THEN action

This proposed system is divided into three different test which are stress, anxiety and depression. Let us take one example for stress test. We used fourteen (14) questions of stress test taken from McShane and Glinow [11]. The list of questions are stated as follows:

Q1: In the last month, how often have you been upset because of something that happened unexpectedly?

Q2: In the last month, how often have you felt that you were unable to control the important things in your life?

Q3: In the last month, how often have you felt nervous and stressed?

Q4: In the last month, how often have you dealt successfully with irritating life hassles?

Q5: In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?

Q6: In the last month, how often have you felt confident about your ability to handle your personal problems?

Q7: In the last month, how often have you felt that things were going in your way?

Q8: In the last month, how often have you found that you could not cope with all things that you had to do?

Q9: In the last month, how often have you been able to control irritations in your life?

Q10: In the last month, how often have you felt that you were on top of things?

Q11: In the last month, how often have you been angered because of things that were outside your control?

Q12: In the last month, how often have you found yourself thinking about things that you have to accomplish?

Q13: In the last month, how often have you been able to control the way you spend your time?

Q14: In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Thus, the users need to choose among 5 answers which are;

0:never; 1:almost never; 2:sometimes; 3:fairly often; 4:very often

Thus, the rules for stress test level will be:

IF

Q1 is 2 and Q2 is 1 and Q3 is 3 and Q4 is 4 and Q5 is 1 and Q6 is 2 and Q7 is 3 and Q8 is 3 and Q9 is 1 and Q10 is 0 and Q11 is 3 and Q12 is 1 and Q13 is 4 and Q14 is 3

THEN

moderate stress

There are three (3) different score level which are starting from 0 till 56, where;

0 - 19 : Low stress

20 – 39: Moderate stress

40 – 56: High stress

The score level can be calculated using weighted sum method. If there are M alternative and N criteria then, the best alternative is the one that satisfies the maximization case of the following expression:

$$P_i = \sum_{j=1}^N a_{ij} w_j \text{ for } i = 1, 2, 3, \dots, M.$$

where P_i is the WSM score of the best alternative, N is the decision number of criteria, a_{ij} is the actual value of the i -th alternative in term of the j -th criterion, and w_j is the weight of importance of the j -th criterion. The assumption that governs this model is the additive utility assumption. That is the total value of each alternative is equal to the sum of the products given. This study chose the weighted sum method due to the precise and accurate results for the test that has been conducted.

Next is the **implementation phase**. In this phase, the system as shown as Figure 2 is divided into several sub-modules and actual coding based on the system requirements. The database is an important part in the development of the rule-based system. It is used for storing all information needed for the mental disorders. For this purpose, the MySQL is used as part of the database and PHP language as a tool for implementation.

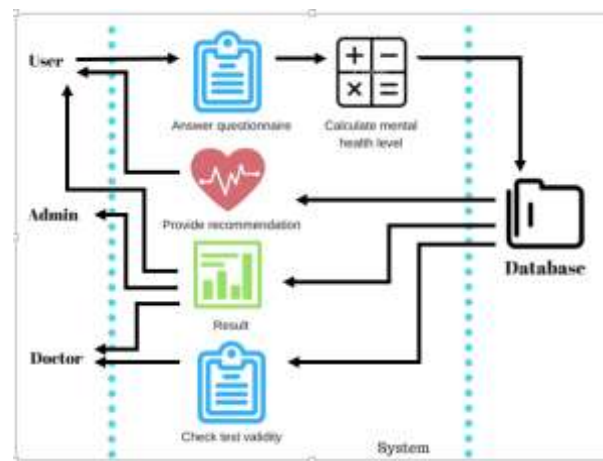


Figure 2: The inference process of mental disorder and stress self-treatment system

The inference process manipulates the knowledge base to deduce information requested by the user and carries out the reasoning required by the expert system to reach a solution. It links the rules given in the knowledge base with the facts store in the database. For example, if the results turn out to be no depression, thus system concludes the user have a happy life and healthy. However, the system suggests the patient for further treatment at the hospital via doctor's suggestion if the results turn out to be moderate stress. Next section discusses on the next phases which are testing and validation of the system.

System testing and validation is performed to test if the functionality abides the initial requirement specification set by the users. This stage is important to ensure the system free from error before releasing for use. The errors such as logic errors, debugging, successful link between the module or menu, rules checking and sample field are all tested. The validation concern with diagnostic result so as to closely match the views of human experts. The testing are summarized as follows;

1. The main menu of the system. This main menu, provides information on the system, login button for users, admin and doctor.
2. The questionnaire to perceive the level stress, anxiety and depression. Users are required to answer all the questions and click the submit button at the end of the test.
3. The rule-based technique and weighted sum model are applied to achieve the final results. Results of the mental disorders will appear and the score level of mental disorder, and recommendation are well appeared.
4. Once the results of the test appeared, users need to choose listed factors that contributed to the level of stress, depression and anxiety.
5. This system educates users on early detection of three different mental disorders which are stress, depression and anxiety. Besides, offers self-treatment by providing list of psychology, physically, sociology videos and etc.
6. The system also provides a page where users can communicate with the doctor personally for the consultation.
7. Lastly, once users answered the questionnaire, the system will record all the type of test, score, level of illness, recommendation and the date test was taken.

Commercial Value

This study proposed a rule-based technique for diagnosing the mental disorders and stress self-treatment. A migration from the conventional and tradition mental assessment checker. This system is accurate, friendly, interactive, convenient and flexible internet based-system. Besides, offers the up-to-date information on users' record and treatment history. The results for all tests were provided with the recommendation from the doctor. Users are available do the online chatting personally with the doctor.

The system seem helps the user diagnosed their mental disorder based on every level; stress, anxiety and depression. Besides, gives an awareness to the users for early recovery and prevention.

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ID NO. UniSZA 004

TOPIC: EatSAFE StopWASTE: Mobile app that helps users to reduce food poisoning risk and food wastage

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Abstract: The EatSAFE StopWASTE app was developed to be a user friendly, attractive, informative and flexible smartphone app that helps users to reduce food poisoning risk through food safety knowledge and food poisoning risk estimator. Feasibility and acceptability of the app was found to be at 87.7% and 89.0%, respectively. Sixty one respondents agreed that the app is attractive (83.6%), user friendly (90.2%), easy to understand (95.1%), provides good features (82.0%), informative (86.1%), and useful (91.8%). It can be concluded that EatSAFE StopWASTE app is highly feasible and acceptable among users as an aid to help them in reducing food poisoning and food wastage.

Key words: *EatSAFE StopWASTE, smartphone app, food poisoning, food wastage*

Introduction

Annually, there are millions of people become ill, are hospitalized, and die due to a variety of foodborne illnesses. Pathogens contamination through the food chain has been recognised as a potential hazard in causing food poisoning. Food safety issues have always been continuously challenged by changes in lifestyle, consumer demands (e.g., ready-to-eat products) and also by the increase of international trade. Modern technologies such as good manufacturing practices, quality control and hygiene, changes in animal husbandry, agronomic process, food and agricultural technology do increase the safety of food but do't prevent food poisoning cases from occurring (Rocourt et al., 2003). Contaminations of food products may occur at different stages from growth or production until the final consumption by consumers. In addition, pathogens are capable of attaching to living and inert surfaces and multiply to form microbial communities known as biofilms which are highly tolerant to varied antimicrobial agents (Lewis, 2008). These factors had contributed to the pathogen prevalence in foods and food contact surfaces.

Nowadays, mobile phone refered as "smartphone" offers advanced computing cabability and connectivity just like tablet computer. These features reposition mobile phone as a new information medium (May and Hearn, 2005) and there are about 2.32 billions smartphone users around the world

(Statista, 2018). Several similar apps relating to Good Manufacturing Practices (GMP), Hazard Analysis Critical Control Point (HACCP), Food Handling, and Calculating Food Wastage are available as separate applications from iOS and Android platform. To the best of our knowledge, no equally identical apps are available in Google Playstore that provide food safety knowledge, estimate food poisoning risk and reduce food wastage through reminder. The aim of this paper is therefore to describe the feasibility and acceptability of a new mobile app, EatSAFE StopWASTE to help users to improve their food safety knowledge, estimate food poisoning risk dan reduce food wastage.

Description of app functionality

The two main functionality components of EatSAFE StopWASTE app consist of i) reduce food poisoning risk and ii) reduce food wastage. Food poisoning risk can be reduced through food safety knowledge section which covers, i) common causes of food poisoning, ii) factors affecting microbial growth such as food, acidity, time, temperature, oxygen and moisture abbreviated as "FAT TOM", iii) food utilisation or consumption order using First-In-First-Out (FIFO) or First-Expiry-First-Out (FEFO) principle and iv) 3 rules of Good Food Hygiene Practices. In addition, food poisoning risk estimator section covers four main food categories, namely cereals and grains, fish and meat, fruit and vegetables which will provide users three levels of food poisoning risk (high, medium or low) based on the freshness of food, temperature danger zone and duration of food left at temperature danger zone.

Food wastage can be reduced through StopWASTE section which covers, i) shelf stable food and ii) perishable food. The StopWASTE section reminds users of the foods they buy and thus prevent multiple purchases of the same or similar items. If the foods are shelf stable, the expiry dates will be recorded while perishable foods such as fresh produce the impending spoilage date (three to seven days) was suggested. Table 1 summarized the app functionality.

Background of the innovation

Food poisoning has been a continuous issues in developed and developing countries. One of the reasons is due to lack of food safety and good food hygiene handling knowledge among food handlers and end users. In addition, food wastage due to expired or spoiled products are also on the rise.

App importance to education

EatSAFE StopWASTE app provides users the main causes of food poisoning and factors that lead to foodborne diseases. The information provided are easy to understand, straight forward and give key points related to food safety and food handling. The app also provide users knowledge on how to properly store shelf stable food and perishable food.

Table 1. The key functionality components in "EatSAFE StopWASTE" app.

Component	Description
EatSAFE	Two sub-components were included:
(Reduce food poisoning risk)	a) Food safety knowledge covers the following aspects: i) Common causes of food poisoning

-
- ii) Factors affecting microbial growth such as Food, Acidity, Time, Temperature, Oxygen and Moisture abbreviated as "FAT TOM"
 - iii) Food utilisation or consumption order using First-In-First-Out (FIFO) or First-Expiry-First-Out (FEFO) principle
 - iv) 3 rules of Good Food Hygiene Practices

- b) Food poisoning risk estimator with 3 levels of risks (high, medium and low) covers the following food categories:
 - i) Cereals and grains
 - ii) Fish and meat
 - iii) Fruits
 - iv) Vegetables

StopWASTE
(Reduce food
wastage)

Two sub-components were included:

- a) Shelf stable food
Foods that can be safely stored at room temperature such as canned and bottled foods, rice, pasta, flour, sugar, spices, oils, and foods processed in aseptic or retort packages and other food products that do not require refrigeration until they are opened. Not all canned goods are shelf stable. Some canned foods, such as some canned ham and seafood, are not safe at room temperature. These will be labeled as "Keep Refrigerated."

In order to be shelf stable, perishable food must be treated by heat and/or dried to destroy foodborne microorganisms that can cause illness or spoil food. Food can be packaged in sterile, airtight containers. The shelf life of these food are normally identified by expiry date on the packaging.

- b) Perishable food
Perishable foods include meat, poultry, fish, milk, eggs and many raw fruits and vegetables. It also includes all cooked foods that have to be stored at refrigerator or freezer temperatures. The length of storage time for perishable food in freezer and refrigerator depending on the types of foods ranging from 3 to 7 days in refrigerator and from 2 to 3 months or as per stated on the food packaging in freezer.
-

Advantages of EatSAFE StopWASTE app

EatSAFE StopWASTE app uses popular android platform which can be assessed by many users. With user friendly features and attractive interface helps user to be more engaging with the app.

Commercial potential

EatSAFE StopWASTE app can be added into Google Playstore (Android) or App Store (iOS), food safety awareness program and workshop as well as interactive tool for teaching and learning in related subjects such as food microbiology and food safety.

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ID NO. UniSZA 005	TOPIC: M-AraBIE

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Abstract:

Pembelajaran Bahasa Arab untuk mereka yang tidak mempunyai asas Bahasa Arab memerlukan usaha yang berterusan dan waktu yang lebih panjang. Ini berikutan pelajar tidak mempunyai maklumat dan pengalaman berkaitan Bahasa Arab. Keadaan ini menyebabkan kebergantungan mereka terhadap pensyarah adalah tinggi. Oleh yang demikian satu modul interaktif telah dibina untuk membantu pelajar mempelajari bahasa Arab dengan lebih baik seterusnya dapat meringankan beban pensyarah dalam proses P&P Bahasa Arab bagi pelajar yang tidak mempunyai asas Bahasa Arab. Kajian ini merupakan kajian pembangunan modul pembelajaran Bahasa Arab untuk pelajar yang tidak mempunyai asas Bahasa Arab. Modul ini dibangunkan dan dilaksanakan berasaskan pendekatan pembelajaran teradun. Pembelajaran teradun merupakan gabungan di antara pembelajaran bersemuka dan menerusi e-pembelajaran. Modul interaktif yang dikenali sebagai M-AraBIE ini telah dibangunkan berasaskan tiga fasa utama iaitu fasa analisis keperluan, fasa pembangunan dan fasa penilaian. Ketiga –tiga fasa ini dibentuk berdasarkan ADDIE (Gustafson & Branch 2002) dan model pembelajaran teradun (Bath & Bourke, 2010). Setiap fasa menggunakan instrumen yang tersendiri dalam mengutip data. Bagi fasa analisis keperluan, data diperolehi menerusi soal selidik dan temu bual yang telah melibatkan pelajar dan pensyarah. Manakala fasa pembangunan telah melibatkan soal selidik, temu bual, kesahan pakar dan kajian rintis. Peserta kajian pada fasa ini terdiri daripada pelajar, pensyarah dan pakar. Manakala fasa terakhir iaitu fasa penilaian melibatkan soal selidik, temu bual dan refleksi pelajar. Fasa terakhir ini melibatkan pensyarah dan pelajar. Proses membangunkan modul ini memakan masa yang agak lama kerana proses pemurnian telah berlaku pada banyak peringkat bagi memastikan modul yang berkualiti dapat dihasilkan. Penilaian akhir telah melibatkan penilaian kebolegunaan modul. Dapatan menunjukkan modul ini boleh digunakan, menarik minat pelajar dan memberi mereka motivasi untuk mempelajari bahasa Arab.

Kata kunci: Pembangunan modul, bahasa Arab, pembelajaran teradun

Content

Pembangunan modul bahasa Arab berasaskan pembelajaran teradun ini atau dikenali sebagai M-AraBIE ini telah melibatkan beberapa tiga fasa utama. Fasa tersebut ialah fasa analisis keperluan, fasa pembangunan dan fasa penilaian. Fasa analisis keperluan telah dijalankan untuk mengetahui persepsi pelajar dan pensyarah terhadap pelaksanaan modul M-AraBIE secara pembelajaran teradun. Bentuk kandungan yang diinginkan turut dikaji. Pada fasa ini maklumat diperolehi menerusi soal selidik dan temu bual yang dijalankan terhadap pelajar dan pensyarah. Data yang diperolehi dalam fasa ini telah dijadikan maklumat asas dalam fasa seterusnya iaitu fasa pembangunan.

Pada fasa pembangunan, beberapa prototaip modul telah dihasilkan sebelum modul akhir. Pada peringkat pembangunan prototaip beberapa prosedur telah dilalui termasuklah, kesahan pakar

seramai 9 orang, penilaian secara individu daripada 4 orang pelajar, penilaian secara kumpulan kecil daripada pelajar serta penilaian pensyarah sendiri. Pemurnian secara berperingkat telah dijalankan berdasarkan komen dan cadangan daripada pakar, pensyarah dan pelajar. Prosedur yang dijalankan ini adalah seperti mana disarankan oleh Tessmer (1993) dan Flagg (1990).

Pada fasa penilaian, penilaian kebolegunaan telah dijalankan untuk melihat tahap kebolegunaan modul ini. Selain itu, tahap minat dan motivasi pelajar terhadap modul ini turut dikaji. Soal selidik telah diedarkan kepada pelajar dan temubual turut dijalankan. Selain daripada itu, pelajar turut diminta untuk menulis catatan refleksi mereka terhadap modul yang digunakan.

Modul yang dibangunkan ini mempunyai keistimewaannya tersendiri kerana dibangunkan berdasarkan prosedur tertentu dan didasari dengan teori yang terpilih. Proses pembangunan modul ini juga telah memakan masa yang agak lama dan proses pemurnian telah berlaku secara berulang-ulang dengan mengambil kira pendapat pakar, pensyarah dan pelajar itu sendiri.

Modul ini telah dimuat naik ke dalam sistem pengurusan pembelajaran atau Learning Management System (LMS) UniZA yang dikenali sebagai Kelip agar mudah dicapai oleh pelajar dan pensyarah. Kelip menggunakan Moodle sebagai platform mempunyai elemen yang menyokong proses P&P, mesra bahasa Arab serta mudah digunakan.

Modul ini yang digunakan dalam persekitaran pembelajaran teradun memberi kelebihan kepada pelajar kerana mereka masih berpeluang untuk bersemuka dengan pensyarah di samping menggunakan M-AraBIE secara sendiri. Modul M-AraBIE ini boleh dicapai pada bila-bila masa sahaja tanpa mengira tempat. Keadaan ini pastinya dapat meraikan keperluan dan perbezaan pelajar.

M-AraBIE mempunyai beberapa kandungan utama iaitu video pembelajaran yang telah dibangunkan dengan memuatkan elemen multimedia iaitu audio, animasi, teks, gambar dan suara narasi. Selain itu, aktiviti lain turut disediakan termasuklah kuiz dan forum. Pautan-pautan ke laman web yang terpilih turut disediakan untuk memberi pendedahan kepada pelajar. Selain itu, bahan asas seperti pautan ke kamus elektronik dan pautan ke laman terjemahan turut disediakan.

Hasil kajian telah melaporkan modul ini mempunyai tahap kebolegunaan yang baik. Pelajar memberi reaksi yang positif setelah menggunakan modul ini. Keadaan ini menunjukkan modul ini mempunyai peluang untuk diperkembangkan seterusnya membantu pelajar untuk menguasai Bahasa Arab dengan lebih baik khususnya untuk mereka yang tidak mempunyai asas bahasa Arab.

Selain daripada itu, tatacara pembangunan modul ini telah direkodkan dengan terperinci. Segala maklumat yang direkodkan dapat menjadi rujukan kepada kajian lain yang berhasrat untuk membangunkan modul berasaskan pembelajaran teradun.

Modul yang dihasilkan ini mengandungi pembelajaran bahasa Arab pada peringkat asas. Oleh yang demikian, ia dilihat mempunyai potensi yang besar untuk disebarluaskan selain digunakan di UniZA. Ini kerana bahasa Arab merupakan bahasa yang penting selepas bahasa Melayu dan bahasa Inggeris. Selain itu, modul ini bersifat fleksibel boleh diakses tanpa mengira waktu dan tempat serta mempunyai persembahan yang mampu menarik perhatian pelajar.

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ID NO. UNISZA 006	“CAIS@LAW : Computerized Accounting Information System for Small Law Firms in Malaysia

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Abstract: Cais@ Law is developed to assist law students to learn basic accounting of a legal firm via computerised system. Cais@Law merely requires basic Windows operating system to enable the firm to record their financial transactions on daily basis. It has three modules, which are Client Data Module, Office Account Module and Client Account Module. The documents such as voucher, receipt, invoice, bank statement and client's data will be the input for the Cais@Law. Other than for teaching and learning purposes, Cais@Law is also designed to assist small law firms in Malaysia to manage the financial transactions, monitor the firm's performance, record the cash inflow and outflow of clients account and facilitate the auditing process. The report produced by Cais@ Law could be used by the lawyers for submission to the professional body as evidence of a good account keeping by the firms.

Key words: e -Education, account management system, Social Innovation

Content

One of the vital components of a successful private legal practice is a good account management. In Malaysia, majority of the legal firms can be categorised as SMEs and they have specific processed and rules regarding accounting records should be kept and recorded (Abd. Ghadas et al., 2015). Different than commercial companies, law firms have to manage the Client Account separately from Office Accounts to ensure accountability of the client monies. Cais@Law is designed based on common and standard small law firms' transactions which represented basic accounting records of law firms which law students must know prior into going into practice. Cais@Law could also be utilized via the e-learning portal (Kelip).

Cais@Law was developed using Rapid Application Development (RAD) methodology. RAD integrates project management techniques, development techniques, users and tools to build quality application systems in a fixed time frame to deliver business value. The first phase of the RAD is to understand the requirements of system (analysis and quick design). It requires that high level or knowledgeable end-users determine what the functions of the system should be. The second phase is a repetition of prototype development (development, demonstrate, design). It including creating database physical design and

mainly focuses on translation of design into programming codes. A code to connect from programming language to MySQL Database Management System (DBMS) is created.

The third phase is testing the prototype to validate Cais@Law business processes. Normally programs are written as a series of individual modules and functionality. Cais@Law is tested by looking at the functions available in the system. Later, the flow of the system is tested to ensure that interfaces between modules work (integration testing). Next, the analysis report of the system is compiled. The next process involved an enhancement and errors corrections of prototype. This process is repeatedly done until the prototypes meet the research objectives. The last phase is deployment in actual environment when all system functionalities and databases design have been validated.

Cais@Law Architecture

Cais@Law is designed based on three-tier client-server architecture as shown in Figure 1. The first-tier is presentation layer. The presentation layer provides the application's user interface (UI). This involves the use of Graphical User Interface for smart client interaction, and Web based technologies for browser-based interaction. The presentation tier displays information related to bank account, client profile, developer profile, chart of account, client account and office account. It communicates with other tiers by outputting results to the browser/client tier and all other tiers in the network.

The middle layer is business logic. The business logic tier is pulled out from the presentation tier and, as its own layer; it controls an application's functionality by performing detailed processing. The main function in Cais@Law is client account and office account. The client account is cash book/cash account managed by law firm for the client's case transaction. Meanwhile office account is account for law firm operation. The client account is not a part of law firm account but some amount from the client account will contribute to law firm income. The Cais@Law database provides database services in Tier 3 Database processing.

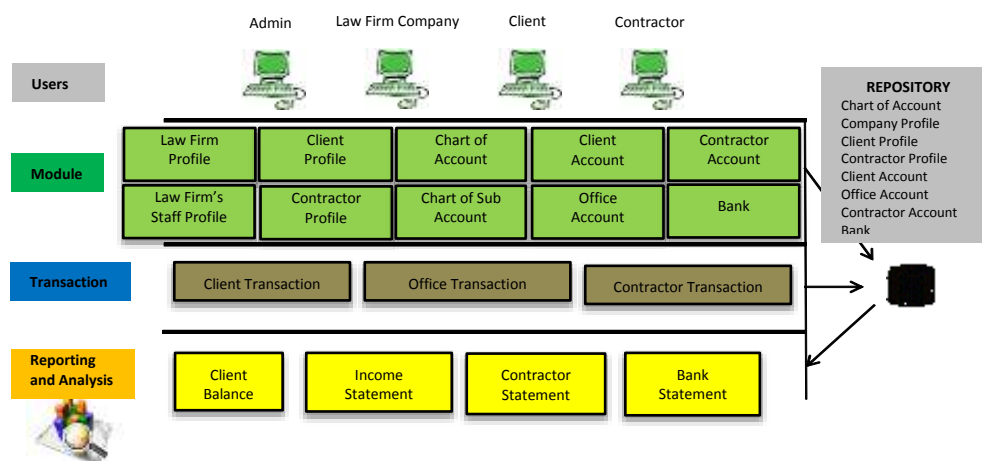


Figure 4: Cais@Law Architecture

Cais@Law

In education, Cais@Law play significant role can in assisting lecturer to teach law program student to learn basic accounting of a legal firm via computerised system. Student can learn the role as admin to manage account admin account, law firm account, client and contractor for a real case of problem without basic knowledge of accounting.

The advantages of Cais@Law are:

- I. Provide system prototype for learning accounting management process for non-accounting background.

- II. Practical and user-friendly system.
- III. Increase the effectiveness of management of account.
- IV. The interactive and intuitive user interface will ease student in learning the management system.
- V. Output could be used for audit purposes.

Commercial Value

Cais@Law can be used by lecturer, instructor, teacher and student for law program in teaching and learning accounting system for legal firms. It also is marketability to small to medium law firm in managing account system.

Conclusion

Cais@Law can be used as tool in teaching and learning for Law student. It will assist student to understand the accounting process at legal firm.

Acknowledgement

This work was supported by SOTL Grant under the Academic, Quality and e Learning Centre (AQeL) and the Research Management and Innovation Centre, Universiti Sultan Zainal Abidin, Terengganu, Malaysia.

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ID NO. UNISZA 007	TOPIC: B-CAKNA: Cancer Education for Timely Screening & Prevention of Breast Cancer.

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Abstract: Breast cancer is the most common cancer and the leading cause of cancer death among women in Malaysia. Preventive activities of breast health especially mammogram screening was found to be effective in reducing the mortality and morbidities related to breast cancer. Mammogram screening for example, may reduce death from breast cancer up to 35%. However, uptake of screening is still unsatisfactory and advanced presentation of breast cancer remains. Existing web or app-based breast cancer education lack information on breast cancer screening method that should be done according to the individualized risk category of the user. Thus we designed a Malay medium app and web-based breast cancer education with suggestion of screening method based on personalized user risk category. It also contains vital information about mammogram, prevention of breast cancer and method of breast self-examination which will increase the knowledge, awareness and increases the chance of early detection of breast cancer. The objective is to increase the knowledge and awareness of breast cancer and its screening, thus increasing the chance of early detection of breast cancer through a web-and app- based education. We also intend to measure the effectiveness of the in increasing knowledge of breast cancer with the education medium.

Key words: breast cancer, mammogram, screening, mobile app

Content

Current data of breast cancer show there is still much to be done to increase awareness of breast cancer and its screening. Despite the availability of screening program, the percentage of patient presented at the advance stage are still evident. About 3 percent of breast cancer patient presented at stage III and IV which give rise to a grave prognosis and low survival rate. A 5-years survival rate for stage III is between 40 to 70 % whereas stage IV average survival rate is 3 years. As compared to other countries, Malaysia has higher Mortality to Incidence ratio (0.49), Thailand (0.38), South Korea (0.12) and Hong Kong (0.16). It showed that most of the cancer are detected late or ineffective treatment and lead to high mortality rate. Most of the studies consistently showed that high mortality is associated with poor cancer awareness, lack of early detection, poor of implemented and effective screening program and lack of timely access to cancer treatment.

Preventive activities of breast health especially mammogram screening was found to be effective in reducing the mortality and morbidities related to breast cancer. Based on National Morbidities Survey 2011, only 6.6 percent of eligible women in Malaysia undergone mammogram. The common factors of mammogram poor uptakes include the perception of not being at risk, lack of time, distance to screening facilities, not knowing of where to go, cost of screening, fear of cancer and fear of painful mammography.

Therefore this web and app based education regarding breast cancer was designed to increase awareness of breast cancer and uptake of mammogram. Existing web or app-based breast cancer education lack information on breast cancer screening method that should be done according to the individualized risk category of the user. Other than having **suggestion of screening method based on personalized user risk category**, the content was also tailored to tackle most of the common causes of not going for screening. These include vital information about mammogram, prevention of breast cancer and multimodal teaching of breast self-examination which will increase the knowledge, awareness and

increases the chance of early detection of breast cancer as well as the nearest center for mammogram and how to get one.

This multimodality education tool can be used to educate the general public to increase the general public awareness on symptoms of breast cancer and increases the chance of early detection. It is also used for teaching of medical students in holistic approach regarding breast cancer, which not only include the information about breast cancer and screening, but also the prevention by modifying lifestyle risk factors which can also be assessed using the app. The student can also test their knowledge on breast cancer screening according to a person's risk factors. This web-based education proved to be effective to increase the knowledge of breast cancer and its' screening by comparing a pre- and post-test on knowledge in a group of students exposed to the web-based education material using paired t-test ($p < 0.001$, CI 3.4, 9.2, $t = 4.74$) (Figure 1) The app version may be commercialized and be made available to the public. The commercialization potentials include features such as a user friendly mobile apps to help public increase screening rate for breast cancer according to their risk category, mobile apps and web that aid public to do proper breast self-examination and also the capability of the apps in estimating physical activity of users to reduce risk of breast cancer.

Hopefully, this method of education will increase early detection of breast cancer which will improve the survival and reduce the severity of breast cancer in Malaysia.

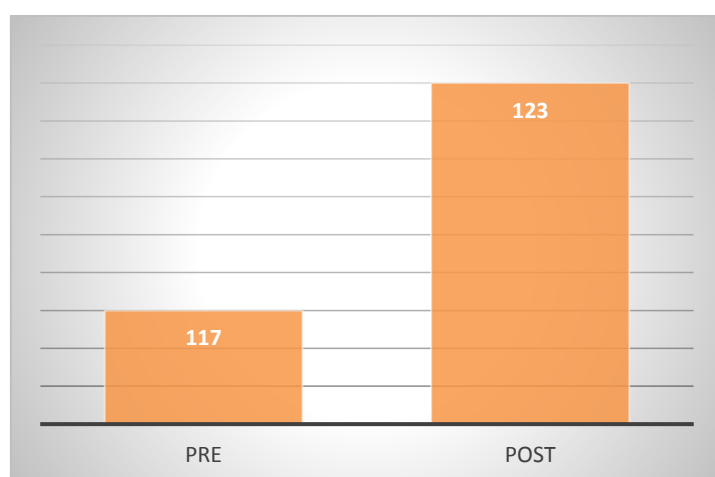


Figure 1: Mean pre- and post-exposure marks on knowledge of breast cancer and its' screening among students.

Acknowledgement

We are grateful to Academic, Quality and ELearning Centre of University Sultan Zainal Abidin for the support in producing the web based education materials and also to the Education Ministry for the grant used to produce the mobile apps.

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ID NO. UNISZA 008	TOPIC: Blended Learning monitoring and reporting system

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Highlights: Blended learning is the staple pedagogy approach in Malaysian Higher Education Institutions where it combines online and face to face learning especially to support the Education 4.0. In UniSZA, Knowledge and e-Learning Integrated Platform (KeLIP) platform was used as the official learning management system (LMS) for the implementation of blended learning. As a center of Academic Quality and e-Learning (AQEL), the blended learning approach are need to be ensured widely applied among the lecturers. The monitoring process requires tedious works as more than 1000 courses conducted in every semester need to be checked in meeting the blended learning. The report should be accurate in ensuring not only all the courses are registered in the LMS, but also the blended learning elements are executed as in the guideline. This includes the existence of learning elements such as a course information, 7 resources, 3 activities and 2 assessment. Blended Learning Monitoring and Reporting System was developed to monitor the blended learning achievement and produce the reporting. Besides that, this system will help lecturers to achieve their blended learning target.

Key words: *blended learning, learning management system, monitoring system*

Introduction

Blended learning is the staple pedagogy approach in Malaysian Higher Education Institutions where it combines online and face to face learning especially to support the Education 4.0. In UniSZA, Knowledge and e-Learning Integrated Platform (KeLIP) platform was used as the official learning management system (LMS) for the implementation of blended learning. As a center of Academic Quality and e-Learning (AQEL), the blended learning approach are need to be ensured widely applied among the lecturers. The monitoring process requires tedious works as more than 1000 courses conducted in every semester need to be checked in meeting the blended learning. The report should be accurate in ensuring not only all the courses are registered in the LMS, but also the blended learning elements are executed as in the guideline.

Content

Description

This online monitoring system consists of THREE main modules; live blended learning reports, analysis forms and achievement reports. Live blended learning provides current status of blended learning implementation percentage. The system will recommend the lecturer of each individual course what need to be added in completing the course with at least 30% of mod blended learning. Analysis forms are prepared for the staffs to update the available and offered courses in the University. In the achievement reports, the system can produce reports that can assist the management to achieve the



blended learning KPI. This includes courses that are not yet registered in the LMS, lecturers who are not using the LMS and statistics on blended learning achievement for each faculty.

Context

This innovation is aimed to assist management to monitor the blended learning achievement status. It also assist lecturer to complete the blended learning achievement by recommending the learning elements that can be added into the course.

Important to education

By executing blended learning, learners will gain more effective learning outcome. This system will help management to monitor and enforce each lecturer to implement the blended learning approach to have a better learning outcome for the academic program.

Advantages/Innovation

The element of recommendation of what is missing in achieving the blended learning to the lecturer is an innovation of this system.

Commercial Values

As the system is integrated with the popular open source Moodle platform, this system can be used by many other academic institutions to help them monitor and enforce blended learning to each course.

Acknowledgement

We would like to thank all the members of Pusat Kualiti Akademik dan e-learning for their commitments on this project.

References

None

ID NO. UNISZA009	TOPIC: MOSQUE MADE MERRIER

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Abstract: During the reign of Islamic empire, mosque has been the centre for not only prayers but all activities such as educational, business, and community. After almost 1500 years of the arrival of Islam, Muslims nowadays are been driven away from the teachings and leaving the mosques unvisited by many. To bring the glory back, we develop MOSQUE MADE MERRIER applications with the idea to make inform all activities that happen in the mosque, to monitor the response from the people and their attendance in surround areas and finally, to generate reports for further actions. All teaching activities (lecture, scripture & ustaz), community activities are made available on the mosque server and is accessible by the people using smart phone. Moreover, the obligatory of Friday prayer can be enforced by the State Government via the use of attendance electronic recording. This application serves as a platform to bringing the community together to strengthen their Jemaah and helps them to stay connected with their mosque.

Key words: *please provide up to 5 keywords. Please try to stick to one line.*

Content

Key words: *Islamic Education, Merry Mosque, Friday Prayer, Connecting Jemaah*

Introduction

Technology has been used in many different areas of well-being. Society has benefited tremendously from the development of ICT. Religious activities should also embrace into this new trend. Back then, mosque has been the centre of communication between communities, however, nowadays we saw less people coming to mosque, the dissemination of activities is still lacking and no available tools to monitor the joy of the mosque and reporting. To address this problem, we propose a mobile application with three different features, to inform, to monitor and to report on all activities happen in the mosque.

Content

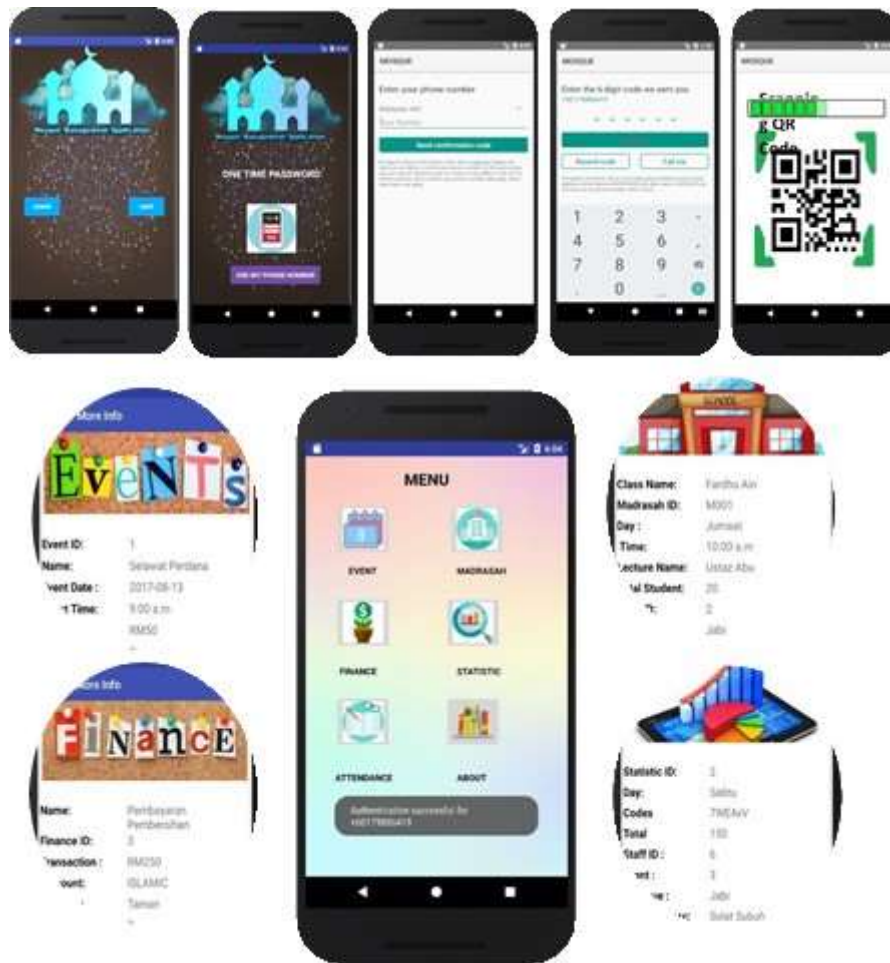
The product allows the dissemination of activities that are planned in the nearby mosque to the surrounding community easily via mobile phone.

An android based application for assisting the management of the mosque throughout the country based on State Government.

This application makes informs all types of activities that are planned in nearby mosques such as lectures, scriptures and ustaz. All people can make themselves available to attend the lectures and therefore nurturing knowledgeable community.

The use of smartphone has been widespread and since this application can be freely installed in smartphone, therefore, messages can be made available to the community without barrier, and Religious Agency can monitor the activities and obtain the statistics afterwards.

The whole system can be used by Pejabat Agama Islam in each state to manage the mosques throughout their constituency easily.



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ID NO. UNISZA 010	TOPIC: BactFinder®: Mobile Application to Facilitate Bacteria Identification.

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Abstract:

BactFinder® is an interactive mobile application designed to facilitate bacterial identification based on biochemical tests and bacterial morphology. It is widely known that bacteria constitute a large domain of prokaryotic microorganisms, thus classical way of bacteria identification are tedious and time-consuming. Identification of bacteria is a systematic process that uses different techniques to narrow down the types of bacteria that are present in a bacterial culture. This android application consists of 19 types of biochemical tests including bacteria morphology for the identification of bacteria. Databases are created based on information gathered from Bergey's Manual of Systematic Bacteriology and related scientific journals. BactFinder® is a user-friendly, fast respond and accurate mobile application to simplify bacteria identification process in the laboratory. This application is suitable for undergraduate, postgraduate and academican in microbiology and biotechnology field.

Key words: BactFinder®, bacterial identification, biochemical tests, morphology, mobile application.

Introduction

BactFinder® is an Android mobile application designed to provide tools and general information on bacterial identification. Bacteria has huge diversity, but only a few are pathogenic and causes diseases. Identification of bacteria is a systematic process that uses different techniques to narrow down the types of bacteria that are present in a bacterial culture. This application consists of 19 types of biochemical tests including bacteria morphology for the identification of bacteria. The software uses probability matrix

for the identification. Databases are created based on data published from scientific journals and reference books (Bergey's Manual of Systematic Bacteriology and Bergey's Manual of Determinative Bacteriology). The purpose of this application is to develop an innovative and interactive laboratory tool for bacterial identification based on biochemical tests and bacteria morphology characterization.

Background of study

Principles of identification

Bacterial identification is the first step in establishing bacterial etiology of a particular disease. It includes the procedures and techniques to identify bacterial pathogens responsible for particular diseases correctly. Bacteriologist employs a wide variety of techniques, based on known characteristics of specific bacterium.

Identification of bacteria requires the knowledge of their morphological, biochemical, physiological and genetic characteristics (Tang et al., 1998). Collectively, these characteristics are grouped as phenotype and genotype. Phenotypic properties are expressed properties of the organism like shape, size, staining properties as well as reactions in biochemical tests (Abel et al., 1963). These are the properties that can be measured without referring to the genome. Phenotypic criteria are based on observable physical or metabolic characteristics of the bacteria. Genotypic identification use molecular techniques to identify bacteria by DNA or RNA analysis of the bacterium's genome (Lane et al., 1985). This usually involves detecting the presence of a gene or a part of RNA product that is specific to a particular organism. Most of the conventional bacterial identification methods are based on the phenotypic characteristics of bacteria. They can be classified as (Tang et al., 1998):

- Identification by bacterial cultivation
- Bacterial identification based on enzymatic capabilities
- Tests for presence of metabolic pathways.

Challenges in bacterial identification

Traditional methods of bacterial identification rely on phenotypic identification of the causative organism using Gram staining, culture and biochemical methods. However, these methods of bacterial identification suffer from two major drawbacks - time-consuming and tedious. Researchers need to manually refer to reference books and journals in order to accurately identify the bacterial strains. Until now, there is limited development of any innovation for direct bacteria identification including mobile application.

Description of BactFinder® Application

BactFinder® is an Android application accessible through smartphone (Figure 1). It is open for public use. This application is registered with Copyright no: LY2018001859. This innovation provides database information about bacteria based on biochemical tests and bacterial morphology. Identification results are purely informative and are not intended to be an official point of view. Because of the frequent taxonomy changes, some bacterial name may not comply with the lists. We try to keep up with the changes and regularly update the database.

BactFinder® Features

This application is designed based on 16S rRNA Identification and biochemical test characterization. However, for the time being only biochemical characterization part which includes 19 types of biochemical tests and bacteria morphology are available for use. The genotypic identification part (16S rRNA identification) will be the next phase of development of BactFinder®.

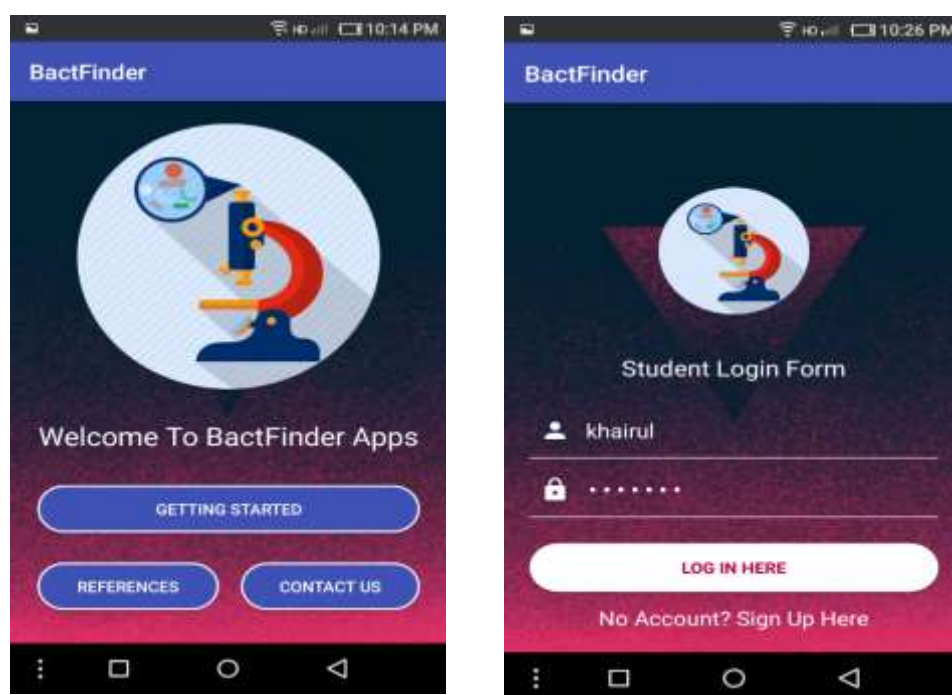


Figure 1: BactFinder® application interface.

The list of biochemical tests included in the application are as followed:

✓ Colony morphology	✓ Starch hydrolysis
✓ Gram staining	✓ H ₂ S production
✓ Hemolysis	✓ Indole production
✓ Mannitol fermentation	✓ Motility
✓ Endospores	✓ Urea
✓ Nitrate reduction	✓ Methyl red
✓ Glucose Fermentation	✓ Citrate utilization
✓ Lactose Fermentation	✓ Voges proskauer
✓ Sucrose Fermentation	✓ Gelatin
✓ Oxidase	✓ Catalase



Application of BactFinder®

This application is suitable for public use, undergraduate, postgraduate, academician, microbiologist and researchers in biotechnology fields. Accurate and definitive microorganism identification, including bacterial identification and pathogen detection, is essential for correct disease diagnosis, treatment of infection and trace-back of disease outbreaks associated with microbial infections. Bacterial identification is used in a wide variety of field including microbial forensics, criminal investigations, bio-terrorism threats and environmental studies.

Novelty and inventiveness

BactFinder® is the first mobile application on bacterial identification that has been developed in Malaysia by Malaysians. Its potential is huge as an innovative biotechnology laboratory tool that can be used by university students, academician as well as researchers in biotechnology fields. To make it more informative, we have included its own bacteria wikipedia which include images and general bacterial information. The aim of this application is also designed to ease and simplify bacterial identification processes in the laboratory.

Commercialization potential

BactFinder® has a great potential for commercial use because of its wide target of users (undergraduate, postgraduate, academician, microbiologist and researchers in biotechnology field). This application is user-friendly with innovative technology to facilitate quick prediction analysis in the laboratory. The application is also proven to give a fast response (± 1 seconds) and accurate results based on Bergey's Manual of Systematic Bacteriology.

Acknowledgments

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ID NO.
UNISZA 011

TOPIC: TEACHERFIERA.COM

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Abstract: Teacherfiera.com helps English Language teachers in their lesson planning and teaching by providing original, home-made teaching materials such as printable illustrations and worksheets, books, audio clips, videos and Powerpoint slides as well as ideas through its website, Facebook Group, Telegram Channel and Group. These materials are all fully compatible with the latest CEFR-aligned curriculum, introduced at the beginning of 2018 at all primary and secondary schools in Malaysia. This compatibility helps the implementation of the new curriculum as it provides supports in terms of textbook and non-textbook materials, curriculum needs, as well as assessment. The functionality of Teacherfiera.com extends further as a multi-platform online Community of Practice (CoP) that gets ESL teachers engaged in discussions and supporting one another on specific materials as well as general English Language Teaching in terms of pedagogy and methodology. Joined by teachers, trainers and officers from various divisions and departments from Ministry of Education Malaysia, Teacherfiera.com proves to be a round-a-clock, "one stop centre" for Primary Schools English Teachers and anyone interested in English Language Teaching worldwide.

Keywords: *Primary School ELT, Community of Practice, CEFR Implementation, Teachers Professional Development*

Introduction

Teacherfiera.com is a website that serves as a one stop centre for English language teachers of Year 1 and Year 2, especially in Malaysia. It was first developed in late 2016 as a safe place to store and share home-made teaching materials by Mdm. Wan Zhafirah (also known as Teacher Fiera) and husband, Mr. Abdul Hakim Ali, both are teaching English at primary school in Pasir Mas, Kelantan. After a few months, the visitors count went drastically up, by the third month of launching, the blog served an average of 8000 visitors per month. As more visitors emailed us to ask questions and suggestions, we decided to create a Facebook group, a Telegram channel and a Telegram group. As of this time of writing, there are 14876 members in the Facebook group, 7987 members in the Telegram channel and 18029 members in Telegram group, with the website itself receives more than 1.2 million page-views from an average of 25000 active users per month. The majority of the members and users in these platforms are Malaysian English language teachers and the groups serve as a very important multi-platform online Community of Practice (CoP). Dr. Radzuwan is involved at various stages and development of Teacherfiera.com, mainly giving technical advice as a language and education technology expert. He also works on the user interface experience as well as the social networking aspects of Teacherfiera.com.

The launching of CEFR-aligned curriculum by Ministry of Education Malaysia recently, had contributed to the surge of visitors to the blog and groups, as the visitor's count average for the



past 6 months is 25000 visitors per month. As Mdm. Wan Zhafirah is a CEFR District Trainer, and Mr. Abdul Hakim Ali is a CEFR National Master Trainer, the materials and guidelines produced are all compatible with the latest CEFR-aligned curriculum, making it very popular among English teachers, especially those teaching Year 1 and Year 2 in primary schools, to be their reference point.

Description of Innovation

Teacherfiera.com started as a website, and as it develops, the label "Teacherfiera.com" now represents the combination of four different elements: 1) the website Teacherfiera.com, 2) the Facebook Group, 3) the Telegram Channel, and 4) the Telegram Group, each elements functions differently but serves the same ultimate purpose, which is to help English teachers to teach better by providing teaching materials and ideas, while at the same time opens for collaboration and discussion among members within the topic of teaching techniques, materials development, classroom management and general teaching issues.

Teacherfiera.com Website

It is the central store to download teaching materials, consist of ready-to-use, home-made printable materials, audio clips, videos and power-point slides. All printable materials are up to the resolution of A3+ borderless. Consist of flash cards, books, worksheets, puzzles and many more. All audio clips are compressed at higher than CD quality of 192kbps bit rate for high quality while still being manageable in terms of its size (Ruzanski, 2006). Audio clips such as phonics recordings are recorded in-house using studio grade equipment and software. All videos are encoded at full hd 1080p or 720p resolution to ensure high quality output on various screen sizes (Liu, Dey, & Lu, 2015). All in-house videos are recorded using studio grade equipment and software. All powerpoint slides are prepared using high quality images and follows the colour scheme that is effective to both screen projection and human eyes (Malamed, 2011).

Teacherfiera.com Facebook Page

It serves as a platform to showcase the materials uploaded to Teacherfiera.com website while allowing visitors to give comments or ask questions on the particular set of materials. It allows for contextualized discussion on the specific material with us as the author and also other visitors. This informal learning on Facebook Page may serve as part of teachers' professional development (Radzuwan, Mohd Firdaus, Mohd Fazry, & Kamariah, 2016).

Teacherfiera.com Telegram Group

It serves as the main discussion platform in general English teaching context. Everyone in the group can ask any question related to pedagogy, methodology or English language related issues. This platform is used by English teachers to discuss a wide range of issue, from complicated classroom management problem, down to grammatical confusion, making it a significantly important Community of Practice. The nature of telegram group that is instantaneous saves time in receiving answers (Iksan & Saufian, 2017), which makes it preferable for teachers as compared to emails and online forums. This active and fast discussion also provide new ways of thinking and foster peer mentoring among members (Iksan & Saufian, 2017), as well as encourages dialogic reflections among English Language teachers (Rashid, 2018).

Teacherfiera.com Telegram Channel

As the main target audience of Teacherfiera.com are Malaysian English teachers, we understand that access to Facebook is blocked by the main internet provider in all public schools nationwide, making it hard for teachers to be notified of new materials or postings by Teacherfiera.com. As telegram access is not blocked, we created this telegram channel for the sole purpose of giving notifications of new postings by Teacherfiera.com.

Context of Innovation

Teacherfiera.com serves English Language Teaching in general, with a plethora of materials for various levels, but dynamically follows the progress of CEFR-aligned curriculum implementation in Malaysia. As of the year 2018, CEFR-aligned curriculum applies to Year 1 and Year 2 primary schools only and will be carried on to Year 3 in 2019, and so on. Thus, Teacherfiera.com currently places a specific weight towards catering teachers who are teaching English for Year 1 and Year 2 but opens to anyone interested in English Language Teaching.

Importance to Education

As CEFR-aligned curriculum has just started rolling out for Year 1 and Year 2 in Malaysians primary schools in January 2018, many teachers struggle with its implementation as they are still in the process of understanding what to do, and how to do it, not to mention the question of why they must do it. Teacherfiera.com comes in to help teachers in their lesson planning and teaching by providing information that is crucial for successful implementation of CEFR in Malaysia. This also encourages dialogic reflection among teachers in their community of practice as suggested by Rashid (2016) and Rashid (2018). The impact that Teacherfiera.com give towards assisting ELT and the implementation of CEFR in Malaysia is evident as it is used not only by teachers personally, but also by officers and trainers from different divisions and departments within the Ministry of Education Malaysia, such as FasilINUS and SICS+ officers to conduct trainings in their respective state/district. Furthermore, as everything provided by teacherfiera.com are free of charge and globally accessible, it opens for worldwide participation without cost limitations.

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ID NO. UNISZA 013	TOPIC: Kualiti Hidup Komuniti Terpilih (QoL-My)

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Abstract:

QoL-My adalah modul pengajaran yang dibangun untuk menambah bahan bagi kursus Pembangunan Komuniti di Fakulti Sains Sosial Gunaan, UniSZA dan dibuka kepada pengguna luar. Kandungan modul memfokuskan kepada komuniti terpilih dan juga masyarakat awam lain. Ia boleh dicapai secara atas talian (online) di laman web dengan nota ringkas, *apps based info graphic* dan pengukuran tahap kualiti hidup. *Novelty* QoL-My ialah, ia merupakan satu ruang baharu kepada pelajar dan komuniti untuk mendapat ilmu yang berkesan, menarik dan mudah melalui capaian internet. QoL-My juga menyediakan item pengukuran kualiti hidup melalui instrumen yang disediakan. Pengguna dapat mengukur kualiti hidup mereka melalui instrumen indikator kualiti hidup yang dipilih. Kesungguhan meningkatkan kualiti hidup dan kesejahteraan komuniti terpilih selaras dengan usaha kerajaan menuju negara maju pada tahun 2020. Rakyat perlu didedahkan dengan pengetahuan untuk mengukur tahap kualiti hidup dan berpengetahuan dalam memilih indikator yang boleh meningkatkan tahap kualiti hidup mereka. Selaras dengan dasar baharu kerajaan dan TN50, rakyat harus dipermudahkan cara untuk mengukur tahap kualiti hidup dan sekaligus dapat mengenalpasti cara untuk meningkatkan kualiti hidup. QoL-My akan mempermudah komuniti mendapat pengetahuan mengenai kualiti hidup dan item pengukuran kualiti hidup QoL-My akan membantu pengguna mengetahui tahap kualiti hidup mereka melalui *Apps Soal Selidik Pengukuran Tahap Kualiti Hidup (QoL-My)* yang boleh digunakan dalam sistem operasi android.

Key words: *Kualiti Hidup, Malaysia, indikator kualiti hidup, Komuniti terpilih, QoL-My*

Content

Description of your innovation / product development / design / process.

Kemajuan sesebuah negara diukur berdasarkan kualiti hidup rakyat yang bertambah baik dan berterusan. Rancangan Malaysia Ke-12 (2016-2020) yang diteruskan dengan Transformasi Nasional 2020-2050 (TN50), menunjukkan kerajaan Malaysia menekankan kepada teras utama pembangunan iaitu meningkatkan kualiti hidup rakyat dengan penekanan kepada komuniti terpinggir seperti nelayan, ibu tunggal dan penagih dadah. Kualiti hidup diukur dengan 11 indikator melalui Indeks Kualiti Hidup Malaysia (IKHM) (UPE, 2011). Secara keseluruhannya kualiti hidup komuniti terpinggir khususnya nelayan di Malaysia berada di tahap sederhana (Norizan, 2017). Kesungguhan meningkatkan kualiti hidup dan kesejahteraan komuniti terpilih selaras dengan usaha kerajaan menuju negara maju pada tahun 2020. Rakyat perlu didedahkan dengan pengetahuan untuk mengukur tahap kualiti hidup. Selaras dengan dasar baharu kerajaan dan TN50, rakyat harus dipermudahkan cara untuk mengukur tahap kualiti hidup dan sekaligus dapat mengenalpasti cara untuk meningkatkan kualiti hidup. QoL-My akan mempermudah komuniti mendapat pengetahuan mengenai kualiti hidup dan item pengukuran kualiti hidup QoL-My akan membantu pengguna mengetahui tahap kualiti hidup mereka.

What is the context or background of the innovation / product development / design / process?

QoL-My adalah modul pengajaran yang dibangun untuk menambah bahan bagi kursus Pembangunan Komuniti di Fakulti Sains Sosial Gunaan, UniSZA dan dibuka kepada pengguna luar. Kandungan modul memfokuskan kepada komuniti terpilih yang juga boleh diguna pakai oleh masyarakat awam. Ia boleh dicapai secara atas talian (online) di laman web: <https://sites.google.com/site/qolmykomunititerpilih/> dengan nota ringkas, *apps based info graphic* dan item pengukuran kualiti hidup QoL-My. Pengguna boleh mengukur tahap kualiti hidup mereka melalui *Apps Soal Selidik Pengukuran Tahap Kualiti Hidup (QoL-My)* yang telah dipasang dalam *local storage phone* (storan tempatan telefon). Sekiranya Apps ini mendapat sambutan daripada pengguna, pereka cipta (inventor) akan memuat naik Apps ini ke google play store. Apps ini hanya boleh digunakan dalam sistem operasi android buat masa sekarang.

Why are they important to education?

Kandungan modul memfokuskan kepada komuniti terpilih dan boleh dicapai secara atas talian di laman web dengan nota ringkas dan *apps based info graphic* serta item pengukuran kualiti hidup QoL-My. Novelty QoL-My ialah, ia merupakan satu ruang baharu kepada pelajar dan komuniti untuk mendapat ilmu yang berkesan, menarik dan mudah melalui capaian internet.

Please write any advantages of your innovation / product development / design / process towards education and community.

Modul ini merupakan satu cara memudahkan pengguna untuk mencari maklumat dengan mudah, cepat dan berkesan secara atas talian. QoL-My menyokong secara langsung transformasi pendidikan melalui IR 4.0 di mana pendidikan secara virtual diperlukan kerana perubahan gaya hidup generasi kini. Komuniti juga boleh memanfaatkan modul ini yang menyediakan cara mudah untuk mengetahui tahap kualiti hidup mereka melalui *Apps Soal Selidik Pengukuran Tahap Kualiti Hidup (QoL-My)*.

Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

Modul ini menyediakan soal selidik di mana setiap item akan diberi nilai untuk mengukur kualiti hidup. Pengguna dapat mengetahui tahap kualiti hidup melalui nilai mean yang diperolehi seperti di bawah:

Tahap	Nilai Mean
Rendah	1.0 – 2.33
Sederhana	2.34 – 3.66
Tinggi	3.67 – 5.0

Modul QoL-My Komuniti Terpilih dan *Apps Soal Selidik Pengukuran Tahap Kualiti Hidup (QoL-My)* boleh dimanfaatkan oleh kementerian, agensi kerajaan dan NGO di negara ini seperti:

- ✓ Kementerian Wanita dan Pembangunan Keluarga
- ✓ Kementerian Pembangunan Luar Bandar
- ✓ Lembaga Kemajuan Ikan Malaysia (LKIM)
- ✓ Jabatan Kebajikan Masyarakat (JKM)
- ✓ Semua NGO berkaitan

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ID NO. UNISZA 014	TOPIC: i- Tabayyun:Semakan Isu Tular Berkaitan Falak Kontemporari Menerusi Aplikasi Telefon Pintar

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Abstrak: Saban hari berita palsu berkaitan dengan isu-isu falak kontemporari semakin berleluasa dan tersebar meluas di dalam dan luar negara. Hari ini kita kerap menerima pesanan ringkas dari aplikasi seperti *Whatsapp*, *Telegram*, *Facebook* dan *Email* berkenaan isu-isu palsu falak yang tidak berkesudahan. Bulan beredar mengelilingi kaabah, Marikh sebesar bulan, Sinar Kosmik memasuki Bumi dan Bumi bergelap 15 hari merupakan antara contoh isu tular yang sering kali disebarkan. Jesteru itu, satu aplikasi yang dinamakan i-Tabayyun: Semakan Isu Tular Berkaitan Falak Kontemporari Menerusi Aplikasi Telefon Pintar telah dibina bertujuan mengenalpasti isu-isu falak atau astronomi yang tidak betul. Aplikasi ini juga menyenaraikan konsep sebenar tabayyun berdasarkan al-quran dan pendekatan tabayyun oleh Imam Syafi'i dalam penerimaan khabar sebagai satu alternatif bagi menyelesaikan isu-isu falak kontemporari.

Kata Kunci: *Tabayyun, Khabar Ahad, Isu tular, Berita palsu, Isu falak.*

Pendahuluan

Tabayyun merupakan aspek utama yang perlu diterapkan dan disemaikan dalam diri setiap individu, masyarakat dan negara. Kemudahan teknologi yang serba canggih telah menyebabkan segala maklumat mudah diterima tanpa sebarang halangan dengan cepat dan pantas. Namun begitu, penyebaran maklumat tanpa pengawalan ini mendatangkan impak negatif yang memberi kesan terhadap lambakan maklumat dan berita palsu dalam media sosial. Budaya 'copy and paste' dalam media sosial menyebabkan gejala ini rumit untuk dibanteras kecuali dengan kesedaran setiap individu itu sendiri. Kekangan ini semakin merisaukan apabila perkembangan drastik terhadap aplikasi media sosial seperti *Whatsapp*, *Telegram*, *Line*, *Facebook*, *Twitter* dan *Instagram* yang bukan sekadar mampu menyebarkan mesej malahan gambar, video, rakaman dan jugak dokumen palsu.

Definisi Tabayyun

Tabayyun pada sudut Bahasa ialah penjelasan dan pemahaman, manakala berdasarkan S.Askar (2010) dalam kamus Al Azhar, tabayyun berasal dari perkataan baana (بَانَ), yabinu (يَبِينُ), bayyaanan (يَبَيِّنَانِ), tabyaana (تَبَيَّنَا), tibyaanan (تَبَيَّنَانِ) yang membawa maksud menjadi jelas. Dalam tafsir Ath-Thabari, fatabayyanu juga membawa maksud 'maka periksalah dengan teliti'. Maka ahli qira'at berbeza pendapat dalam membaca firman Allah S.W.T pada perkataan fatabayyanu, ahli qira'at Madinah umumnya membaca fatatsabbatuu dengan huruf tsa' seperti mana yang termaktub dalam mushhaf Abdullah. Manakala sebahagian ahli qira'at lain membacanya fatabayyanu dengan huruf ya' yang membawa maksud tunggulah sehingga kalian mengetahui kebenaran dan jangan terburu-buru menerimanya (Ath-Thabari, 2009). Berdasarkan tafsir Qurthubi (قُرْطُبِيّ) di ambil daripada perkataan At-Tatsabut. Manakala yang lain, mereka membacanya dengan fatabayyanu yang diambil dari kata At-Tabyiin (Imam Al-Qarthubi, 2009). Selain itu, fatabayyanu juga membawa maksud periksalah sebelum kalian berbicara atau berbuat atau membuat keputusan (Al-Jaazairi, 2009). Perkataan (تَبَيَّنَ) juga membawa maksud sinonim dengan perkataan (ظَهَرَ) dan (أَوْضَحَ) yang bermaksud menjelaskan serta menerangkan (Abd. Rauf et al, 2011), (Mohd Khairi, Mohd Nazri, Mohd Fuad, 2010) dan (al-Habsyi, 1989).

Hukum tabayyun

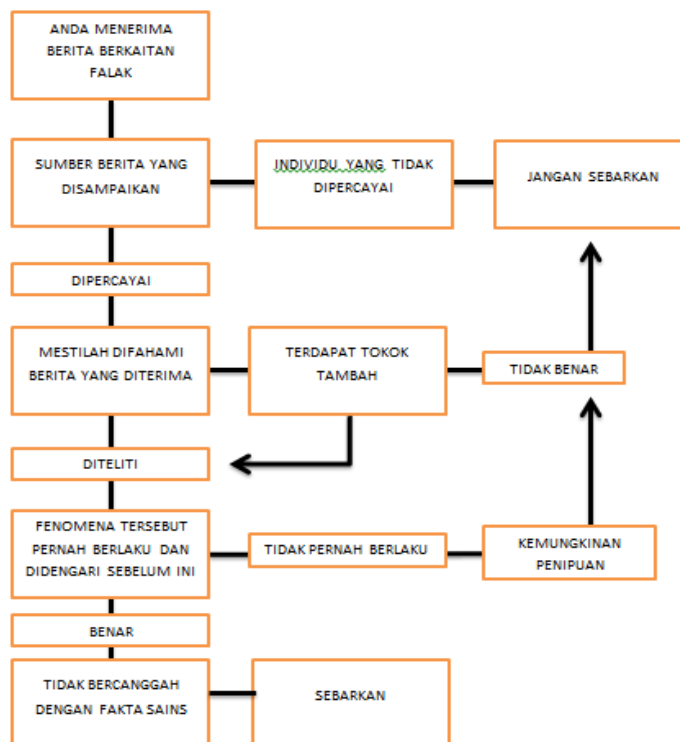
Hukum tabayyun ini adalah diwajibkan berdasarkan surah Hujurat ayat 6 yang bermaksud; " Wahai orang-orang yang beriman. Jika datang kepada kamu seorang fasik, membawa sesuatu berita, maka selidikilah (untuk menentukan) kebenarannya supaya kamu tidak menimpakan sesuatu kaum dengan perkara yang tidak diingini dengan sebab kejahilan kamu (mengenainya), sehingga kamu menyesali apa yang kamu telah lakukan."

Kepentingan tabayyun

Tabayyun sangat penting dan mempunyai banyak faedah yang boleh diperolehi dengan mengamalkannya dalam kehidupan. Malahan Allah telah melarang sekeras-kerasnya agar tidak mengikuti sesuatu yang tidak diketahui. Berdasarkan takwil ayat surah Al- Israa' kita dilarang mengatakan perkara yang tidak diketahui, perkara yang tidak mempunyai pengetahuan tentangnya dan menuduh seseorang dengan sesuatu yang tidak diketahui (Ath- Thabari, 2009).

Ilmu Falak dan Penyebaran Berita Palsu dalam Media Sosial

Ilmu falak memainkan peranan yang sangat penting dalam kehidupan umat islam. Hal ini kerana, bidang ilmu ini berkaitan dengan ibadah-ibadah besar umat islam seperti menentukan awal dan pengakhiran bulan Ramadhan, waktu solat, musim haji dan sebagainya. Oleh itu, maklumat yang tepat amat penting dalam menentukan sesuatu ibadah itu sah mengikut apa yang telah disyariatkan dalam agama. Sejak akhir-akhir ini penyebaran berita palsu berkaitan dengan isu falak semakin berleluasa. Penyebaran berita palsu ini, memberi kesan yang negatif terhadap individu, masyarakat dan negara. Berita palsu ini telah menyebabkan kekacauan dan ketakutan serta menimbulkan fitnah yang mampu mengganggu gugat ketenteraman awam. Kecanggihan alatan komunikasi dan media sosial telah menjadikan medium bagi seseorang untuk menyebarkan berita palsu. Malahan amat merisaukan apabila isu penyebaran maklumat palsu berkaitan falak juga disebarkan tanpa kawalan dalam islam. Rajah 1 menunjukkan aplikasi syarat penerimaan khabar Ahad Imam Syafi'i.



Rajah 1: Aplikasi syarat penerimaan Khobar Ahad Imam Syafi'i.

Kesimpulan

Isu-isu penyebaran maklumat palsu berkaitan falak dalam media sosial perlulah dibanteras bagi menjaga ketenteraman awam. Pendekatan yang sebetulnya perlulah diterapkan agar mampu menyekat isu-isu yang tidak sewajarnya tersebar dalam media. Penjelasan terhadap sesuatu isu perlulah dikenalpasti autoritinya sebelum mempercayainya. Penelitian yang lebih mendalam perlulah diambil sebelum menyebarkan sesuatu isu dalam media sosial.

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ID NO. UNISZA 016	TOPIC : Educating Road User through CD-I

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Abstract: This interactive application aims to provide exposure to 5 categories of road users. Each road user will be shown in the form of clickable images in certain sections. Each user category will be given details about the usage and ethics procedures to be followed. Test modules are provided to test the understanding of the users of this application. All multimedia elements are fully utilized to ensure the clear presentation of content to users.

Key words: *Road Users Ethics, Road User Categories, Interactive CD*

Content

Previously, we had been working on road safety application that focused on school children in terms of the common road user seen on the way to school and signage categories that can be easily found along all the road throughout Malaysia. The Road User Ethics (RUE), enhance the road safety education that has been proposed in FIQIR Road Safety Application (Rawi, N. A. & et Al., 2015). Pedestrian accidents are one of the most prominent causes of premature injury, handicap and death in the modern world (Thomson, J., Tolmie, A., Foot, H. C., & McLaren, B., 1996). Through RUE, more information on five (5) categories of road user will be presented to the user in more interesting ways. The usage of attractive graphics and easy access of functions will help the user to learn more about the correct ethics that should be practiced by road users.

RUE combines the learning theories and utilizing the multimedia elements to deliver the contents to the user. Each types of road users will be presented in clickable images. User will simply click the image to get more info about that type of road user. The information provided for each of road users are what the compulsory attire when using road transport such as bicycle, motorcycle and many more, also what are important rules need to be followed by each of road users. In order to ensure the user really understand the content, a set of various style question can be answered by the user to show their understanding of the contents.

The application can be easily distributed through a low cost compact disc and can be easily play at any desktop or laptop. It can be used by any level of users, either they are educators, learners, parents, guardians or any individuals that can benefit from the contents. Teachers can use it to support road safety teaching and also improve students' knowledge on the ethics of road users.



Acknowledgement

We would like to thank all the members of Centre of Multimedia Studies, Faculty of Informatics and Computing for their commitments on this project.

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ID NO. UNISZA 017	TOPIC: MyDGB_ - Malaysian Dairy Goat Breed

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Abstract: MyDGB is a smartphone application which contains the basic information of the breeds on dairy goat commonly farmed in Malaysia. The app was developed to facilitate and enhances the user experience of interaction to identify the goat breed, and learn about the diseases, treatment and others. The idea presented in this paper is to show how **MyDGB** can be used to enhance the learning experience of students in a ruminant production especially the goat. The **MyDGB** is a teaching aid supplementing the work of the teacher and students in learning about dairy goat breeds in Malaysia. It purposes is to make the learning process easier, interactive, and fun to experience.

Key words: MyDGB, smartphone apps, teaching and learning aid.

Introduction

The usual way in determining the dairy goat breeds is by looking at their external morphology. Common dairy goat breeds such as Sannen, Anglo Nubian and Toggenburg can be identified based on their body and ear colour, body sizes, and facial characteristics. Identification might be difficult and confusing for beginners; therefore, **MyDGB** was developed to help students or beginners to easily identify the breed. As an additional value, information on the dairy goat diseases and treatments were also included in the apps to help users with common health issues in the farm.

Phone apps is an application that can be installed into the ios or android smartphone or tablet and can be used anywhere, anytime. Phone apps can enhance the learning experience by indulging video, text, graphics, and audio into the real world of a student. Student involvement with the phone apps can be used to improve their learning and understanding. Students and others can learn easily through the **MyDGB** anywhere, anytime.

Content

Description of the innovation

MyDGB is a phone application that summarizes several goat breeds characteristic commonly farmed in Malaysia. This app also included the list of common dairy goat diseases and treatment methods. Students can learn on how to identify the goat breed based on their character by referring to the image guides and some videos.

Importance of the innovation

Identification of the dairy goat breed is a crucial skill for students in animal health related field. **MyDGB** will help these beginners to identify the goat breeds based on their characteristics. The utilization of the apps might help them to precisely identify the species of the goat before they can familiarize themselves in the field and farm works. The list of diseases and treatments of will also help them to make early diagnosis of the possible sickness causes of the goats. Students also can learn through enjoying trivia and quiz in this apps rather than just reading.

Advantages of the innovation

MyDGB targeted to make the learning experience of the students more interactive and interesting. It also would act as a teaching aid in helping the teacher in the class and also help students to learn about goat anywhere they prefer. With this application students still can enjoy learning even if the teacher is not available. Layman with interest in goat farming can get information about goat and farmers that face goat health issues might benefit from the diseases and treatments section.

Commercial values of the innovation

MyDGB can be used not only for higher educational institutes, but also can be used by the layman and farmers. It can be commercialised to other faculties and schools as well. This type of application also can be applied to any subjects or courses. The product had been granted copyright on 2nd August 2018 with the reference number of LY2018003242. **MyDGB** also had been awarded gold medal during Putra InnoCreative Competition for Teaching and Learning organised by University Putra Malaysia in August 2018 and silver medal during IDEL, UniCeL, UniSZA in May 2018.

Acknowledgement

The authors would like to acknowledge students from Faculty of Informatics and Computing for their help in developing the apps. The authors also thank Faculty of Bioresources and Food Industry for the full support throughout the process.

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ID NO. UNISZA 019	TOPIC: GLeMS LINUS: Gamified Learning Management System for LINUS Students

GLeMS LINUS: Gamified Learning Management System for LINUS Students

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Highlights: Literacy and numeracy lay the foundation for learning in primary education and beyond. Literacy and Numeracy Screening Programme (LINUS) is an effort by MOE intended to ensure that all students from standard one enable to master the basic of reading, writing and counting at the end of standard three. One of the challenges in teaching these students is their attention and motivation. In the digital era, gamification provides the component of fun that helps in transforming the students' attitudes toward learning. Gamified Learning Management System is developed for special needs students in elementary school, specifically for LINUS students. This application attracts students' motivation and interest in learning. This tool can be a particularly effective motivational tool for engagement.

Keywords: Gamification, LINUS, gamified, motivation, learning management system, multimedia, engagement.

Introduction

LINUS is known to be literacy and numeracy screening that started off on 2010 till now for Students with Special Needs. Literacy is the ability to read, write easy compound sentences using the conjunctions word and apply the knowledge for daily learning and communication. While numeracy is the ability to perform basic mathematical operations as well as understand simple mathematical ideas and apply the knowledge and mathematical skills in daily life [6]. This program is intended to ensure that all students from standard one enable to master the basic of reading, writing and counting at the end of standard three [7].

Content

The concept of gamification isn't new to the world now. It is because it has been used in many applications nowadays. The idea of gamification is using game design elements in non-game context to motivate and increase user engagement to gain knowledge or completion of certain tasks. The term gamification can be defined as the use of game design elements in non-game contexts [1]. It uses the competitive instinct possessed by most people to motivate and encourage the performance of people. The same concept of gamification can also be used to motivate and encourage collaborative and cooperative behavior similar to a competition between football clubs in a league.

The problems of education nowadays are that it is related to the lack of involvement and motivation of students to participate more actively during the learning process. According to the previous study by Gabe Zichermann [2], the use of game elements improves a user's capabilities to learn new skills by 40%. By applying the engagement of players with game experience can be translated into the educational context to facilitate learning and to influence the behavior of students. This approach leads to higher level of commitment and motivation of users to activities and processes in which they are involved. Since players much enjoy spending countless of hours to play games, this motivation should be applied to the classroom [3].

A learning management system (LMS) is a software application or web-based application used for administering, tracking, reporting and delivering educational courses or training programs. It is widely

used in an educational institution such as schools, universities, and colleges. The recent version of LMS applied many gamification elements to influence behavior as well as to improve motivation and engagement during learning process [4]. A study conducted by Traci Sitzmann found that students scored 14% higher using a gamified approach in a course on a subject than those who took a traditional course [5]. With gamified learning management system, it can facilitate the learning process as we can improve student motivation and enhance their engagement while tracking their progress.

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ID NO.
UNISZA 020

TOPIC: PROFICIENCY IN ENGLISH VIA APPS

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Abstract:

The purpose of this apps is to increase the proficiency of English. This apps is design in such a way that the participants or the viewers can increase their command of English both writing and speaking. It is achieved through a step by step learning process and linkages consisting of three levels via apps. The first level, provides the participant the means to sharpen their English skills specifically writing and speaking. So that everyone can speak English confidently. This level is link to the institution that provide the English learning programed for example English conducted by the British Council as mentioned in the website namely <https://www.britishcouncil.my/>. The second level provide the viewers with career advancement. Lipman (2007) notes, "At times when career paths were clear, individuals tended to be more motivated, with tangible goals to work towards. At times when career paths were dim or nonexistent, individuals tended to be less motivated, less focused, more uncertain. That's why it makes good business sense for organizations of all sizes to spend time developing and maintaining thoughtfully structured career path systems." Thus, this apps provide the means for the participants to learn English better so that the chances for getting their job are brighter since English is essential in most working environment. The third level is that the apps provide broad linkages for participants or viewers either to learn locally of abroad. Therefore the links are as follows as it provide the viewers with career opportunity. As such this level will provide the participants or viewers which chance in searching the jobs that they intended to work. The viewers can find various kind of job in split second via accessing this apps. The links that provides the job is <http://www.jobstreet.com.my/en/job-search/job-vacancy.php?ojs=1>. It is expected that his apps will provide broad platform to levels of participants to improve their proficiency in English both the writing and speaking through the content provided by the apps, designed to the different linkages of learning locally or abroad. In addition, this apps allow participants to improve English proficiency and at the same time have the opportunity to get the job or advance their career in different organization. It is envisaged that this apps should pave a way to address the nation real issue of level command of English among the Malaysia at large and the graduate of higher institution of learning. Besides that it also provides the entry point for participant to penetrate business opportunity available globally via right command of English.

Key words: : Apps, English, proficiency, levels, viewers, participants

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ID NO. UNISZA 021	TOPIC: Modul Sokongan Sosial Keluarga (SOS I.K)

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Abstract: Usaha pemulihan ketagihan opiat boleh berlaku sama ada di institusi ataupun dalam komuniti. Pemulihan ketagihan opiat dalam komuniti melibatkan keluarga sebagai penggerak utama pemulihan dengan penglibatan yang berterusan. Penglibatan keluarga disebut sebagai sokongan sosial keluarga dan dicirikan dengan tiga aspek iaitu sumber sokongan, kekuatan sumber sokongan serta bentuk sokongan. Berdasarkan kajian yang dilakukan ke atas 181 orang responden yang terdiri daripada ahli keluarga penagih opiat di negeri Terengganu, keluarga menghadapi cabaran dalam melibatkan diri sepanjang proses pemulihan disebabkan oleh beberapa kekangan seperti pengetahuan, sikap penagih serta emosi keluarga. Justeru, modul ini adalah alternatif untuk membantu ahli keluarga untuk mengatasi kekangan tersebut. Modul yang dibina ini mempunyai empat (4) unit yang mempunyai fokus yang berbeza iaitu: (i) konsep keluarga sejahtera, (ii) cabaran sokongan sosial keluarga, (iii) maklumat klinikal mengenai dadah serta pusat pemulihan yang terdapat di Terengganu, (iv) potensi sokongan emosi serta aspek spiritual. Modul ini dilaksanakan dalam bentuk ceramah, latihan dalam kumpulan (LDK), dan diskusi interaktif. Modul ini boleh dikembangkan di peringkat komuniti dalam mengatasi stigma yang sering kali dikaitkan dengan ketagihan opiat. Modul ini berpotensi untuk dijadikan sebagai satu kaedah pembelajaran sepanjang hayat untuk membangunkan potensi keluarga sebagai agen penting bagi pemulihan ketagihan opiat. Modul ini juga akan dikembangkan ke dalam bentuk aplikasi agar ianya boleh di akses oleh pengguna atas talian bagi membolehkan keluarga lain yang mempunyai penagih memperoleh manfaat yang sama.

Key words: *Sokongan Sosial Keluarga, Pemulihan dalam Keluarga, Pemulihan, Penagih Opiat, Ketagihan Opiat*

Content

Modul ini adalah alternatif untuk membantu ahli keluarga untuk mengatasi kekangan tersebut. Modul yang dibina ini mempunyai empat (4) unit yang mempunyai fokus yang berbeza iaitu: (i) konsep keluarga sejahtera, (ii) cabaran sokongan sosial keluarga, (iii) maklumat klinikal mengenai dadah serta pusat pemulihan yang terdapat di Terengganu, (iv) potensi sokongan emosi serta aspek spiritual. Modul ini dilaksanakan dalam bentuk ceramah, latihan dalam kumpulan (LDK), dan diskusi interaktif. Modul ini



boleh dikembangkan di peringkat komuniti dalam mengatasi stigma yang sering kali dikaitkan dengan ketagihan opiat. Modul ini berpotensi untuk dijadikan sebagai satu kaedah pembelajaran sepanjang hayat untuk membangunkan potensi keluarga sebagai agen penting bagi pemulihan ketagihan opiat. Modul ini juga akan dikembangkan ke dalam bentuk aplikasi agar ianya boleh di akses oleh pengguna atas talian bagi membolehkan keluarga lain yang mempunyai penagih memperoleh manfaat yang sama.

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ID NO. UNM 001
**TOPIC: 3D AUDIO-VISUAL PERIODIC TABLE, "MEKDISEPUR",
FOR THE MENTALLY DISABLED**
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Abstract: MEKDISEPUR is a 3D Periodic Element System with Audio-Visual System for Mental Disabled Persons. This medium is designed for people with mental disabilities in rehabilitation efforts and the introduction of the elemental periodic system. MEKDISEPUR is designed in the form of three dimensions of a beam with embossed writing and additional audio and visual in the delivery of information from every element that exists. The specific purpose of the development of "MEKDISEPUR" is to become an inclusive medium for people with mental disabilities to assist the recovery process and can introduce the material in chemistry learning. The development procedure starts from the idea, then proceeds to the design and realizes it in prototype form. The next step is the prototype validation. The last stage is the trial of product development for students with mental disabilities individually conducted in MA NU Sidoarjo. Feasibility percentage of Chemistry material by 93,3%, media expert equal to 81,6%, and user teacher equal to 90%. This product also received good comments from chemists and media experts, namely the development of media for the monitor screen to be enlarged so that the visual image will be clearly visible, and need to be packing in a practical box. Students who are the subject of trials commented that the media of this periodic system of elements has clear data information and has an interesting appearance to be used as a medium of learning chemistry. The target of product development achievement from which has been planned to reach 90%.

Key words: MEKDISEPUR, Mental Disability, Elemental Periodic System, Inclusive Media

Background

Republic of Indonesia as a lawful country, thus in it, all the people must be treated equally in the eye of the law. The same treatment applies regarding rights and obligations of all countrymen regardless of social status. People with disability is one of country's concern. With the legalization of Act of the republic of Indonesia number 8 year 2016 concerning disabled people (Act of Disabled People) on 15th April year 2016 by President of the Republic of Indonesia, Joko Widodo, "disabled people's rights are protected." Concerning education, on article 10 act number 8 year 2016 stated that, "The rights of education for the disabled are to receive proper education in a force of education at all stages of inclusive and special education, to receive proper accommodation as a student."

According to Data and Education Statistics and Culture Center (2018), there are 2,157 schools for the special needs with the details of : 239 Elementary School for The Special Needs, 116 Junior High School for The Special Needs, 76 High School for The Special Needs, and 1,726 Schools for The Special Needs both public and private. The number of students with disabilities are 128,510 students, with the details of: 3,816 blind, 25,519 deaf, 71,411 mentally disabled, 6,037 physically disabled, 753 autistic, 27,991 multiple disability, and the year 2017/2018 are 28,763 students. So that is why the increment of quality and quantity of education management is needed.

Generally speaking, disabled people have a serious problem in studying. Thus, disabled people need special education. One of those needs is a proper media of learning. Disabled people have the rights to equal education as students in general. In Junior High School, science is a subject which needs an excellent media of learning. This is supported by article 42 section 1 number 8 year 2016 stated that, "Regional government mandated to facilitate Service Units for the Disabled to support the acts of inclusive education in elementary and junior level."

Rachmayana (2016), stated that mentally disabled is a condition marked with below average basic intelligence accompanied with lack of adaptation, which started before the age of 18. Rachmayana also stated that mentally disabled people, have low rate of intelligence growth and have trouble in learning process and social adaptation.

- a. High mentality. Also known as intellectually gifted, where other than having above average intelligence, one also have high creativity and responsibility in doing assignment.
- b. Low mentality. Below average intelligence on the IQ (Intelligence Quotient) can be classified into two groups, they are: slow learners, which are kids who have the IQ around 70-90, and kids with special needs which have the IQ below 70.
- c. Specific-learning difficulty. Having difficulty in learning specific subject.

Chemistry is one of the branches in science which is important to be taught to students with disabilities. Because in daily life, every aspect is related to chemistry, where some aspects are safe, while others are dangerous. One of the materials given in chemistry needs media that is periodic table. With better understanding of periodic table, disabled students can easily understand other branches in chemistry with periodic table as a prerequisite.

Therapy is one of the most common processes in curing disability. There are numerous kinds of therapy is used for the same goal, four of them are: 1). **Applied Behavior Analysis (ABA)**, it uses special training on children by giving positive reinforcement in a form of rewards and/or praises. This type of therapy is measured for its progress, according to *autisme.co.id*, 2). Speech Treatment, sometimes, kids with speech impediment improved their speech ability, but not improved enough for social interaction. In this situation, Speech Treatment helps, 3). Social Therapy, Social Therapist helps by facilitating the disabled to play and frolic with their peers, 4). Game Therapy, playing with peers is useful for speech practice, communication, and social interaction. Game Therapy is helping kids in certain ways.

Based on the reviews above, the researcher gave a new idea in treating them by using MEKDISEPUR. MEKDISEPUR is a media that is designed with a built-in audio in information transmission. This media is expected to facilitate mentally disabled students in learning chemistry subjects. This media is complete with audio to assist mentally disabled students in understanding each and every matters in the periodic table. Mentally disabled students are not the only ones that benefit from it, but also other students with other types of disabilities.

Description

MEKDISEPUR is a 3D Audio-Visual Periodic Table Media for The Mentally Disabled. This media is designed for mentally disabled students in rehabilitating and introduce periodic table at the same time. MEKDISEPUR is designed in a form of braille board complete with audio in order to help transmitting information of every single matter in the periodic table. By pushing a button on the other side of the Board, a sound will emit information about one of the matters in the periodic table. To optimize the system, a few components are needed to meet the following specification:

Table 1. Equipment specification

Battery	Li-ion 3.7 V 2200 mAh
Display	Alphanumeric LCD 16x2
Sound	Stereo 1 Watt

Microcontroller	ATmega328P 12 MHz, 32 Kb
Battery Life	3-4 hours
Number of buttons	122 buttons

PARTS OF MEKDISEPUR

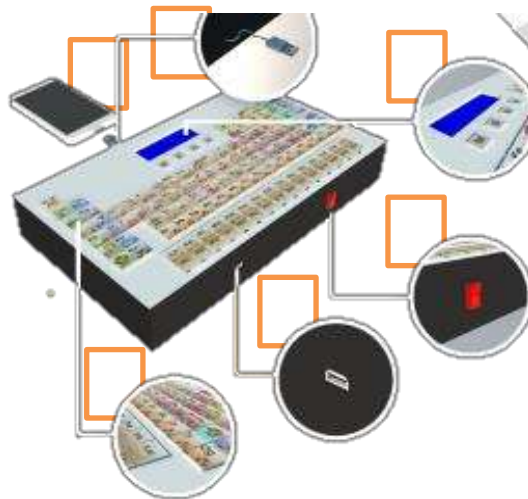


Figure 1. Parts of Mekdissepur

Legend:

1. On/off Switch
2. Charging Port
3. Visual Display
4. MEKDISEPUR Display
5. USB MEKDISEPUR-Visual Display USB Port
6. MEKDISEPUR Buttons

MEKDISEPUR Usage Mapping

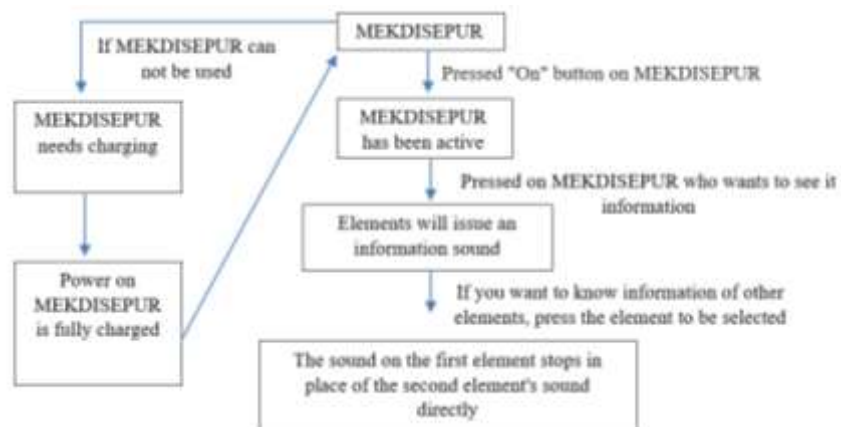


Figure 2. MEKDISEPUR Usage Mapping

MEKDISEPUR Diagram Board

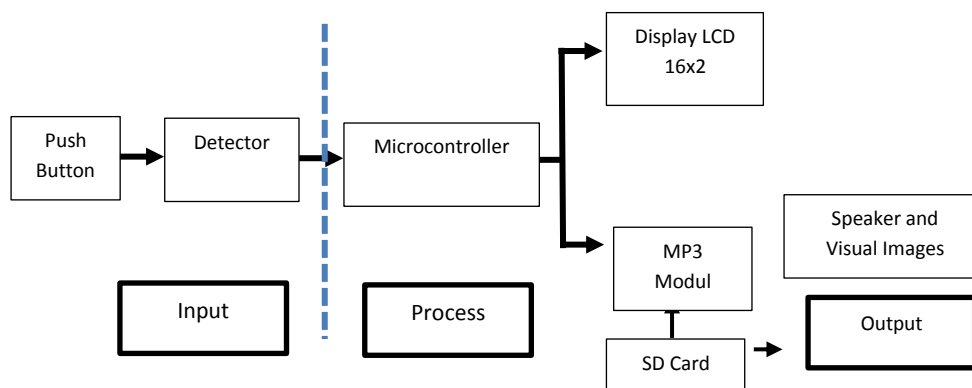


Figure 3. MEKDISEPUR Diagram Board

MEKDISEPUR Implementation Analysis

Analysis is done by calculating button-accuracy, response time when button is pressed until sound is emitted, and battery life.

Table 2. MEKDISEPUR Implementation Analysis

Sound Response	Button Accuracy	Battery Life
467ms	118/118 (100%)	166 minutes
455ms	118/118 (100%)	164 minutes
490ms	118/118 (100%)	160 minutes
499ms	118/118 (100%)	166 minutes
480ms	118/118 (100%)	168 minutes
478.2ms	100%	164.8 minutes

Sound response is acquired from calculating button duration when a button is pressed until sound emitted. From the test, the respond time gave good result of 478.2 ms in average. Button accuracy is testing 118 buttons on MEKDISEPUR to match the expected sound outputs. The test is done by pressing each individual buttons to count every mistakes occurred. From the test, the accuracy score is 100%, which means that every button's function is match with the design. Battery life testing is to measure how long the device last until the battery power is depleted. The average battery life is 164.8 minutes.

Validation Questionnaire Result

a. Validation Questionnaire Subject Expert

Based on validation questionnaire that is done by Husni Wahyu Wijaya, S.Si, S.Pd, M.Si, Ph.D as subject validator stated that the media deemed **proper** as MEDKISEPUR substance for mentally disabled students. The scoring elements from the subject expert are: content decency, linguistic decency, chemistry matter accuracy in MEDKISEPUR as a learning media for mentally disabled students. From those components of the questionnaire, the score acquired on a Likert scale is (93.3%).

b. Media/Device Questionnaire Result

Based on validation questionnaire that is done by Drs. Winarto, M.Pd as a media/device validator stated that the media is **proper** as chemistry's periodic table in learning for mentally disabled students. The scoring elements from the subject expert are: MEDKISEPUR's main display, MEDKISEPUR's graphic display, and MEDKISEPUR as learning media for mentally disabled students. From those components of the questionnaire, the score acquired on a Likert scale is (81.6%)

c. Teachers for The Mentally Disabled Students' Questionnaire Result

Based on validation questionnaire that are done by Faridatur Rofiah, S.Pd dan Winda Al-Mufidah, S.Psi. as teachers for the mentally disabled students' validator stated that the media is **proper** as chemistry's periodic table in learning for mentally disabled students. Scoring elements from the teachers (users) are: subject clarity, language and sentence decency, expected subjects as materials and goals of study, 3D media display, MEDKISEPUR capability in increasing students' motivation to study, easy-to-understand subjects, and MEDKISEPUR as learning media for mentally disabled students. From those components of the questionnaire, the score acquired on a Likert scale is (90%), **proper**.

The Advantages of This Product

1. Felxibel
2. System of periodic which collaborate two systems of Audio Visual
3. Educative
4. Can be inclusive media

The Commercialism

1. Copyright
The aim of making copyright for the product is to get legality right, so when it developed, the researcher will get profit.
2. Mekdissepur Development
Our wishes for the future about this product is as a new innovation in the form of mental disability healing aids can facilitate people with mental disabilities in their recovery and can also be used as a tool for learning the chemistry of the material of periodic system elements.

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ID NO. UPM 001
TOPIC: INGNEOSA®: GAMIFICATION IN SMALL ANIMAL ONCOLOGY FOR VETERINARY UNDERGRADUATES

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Abstract:

Educational games in digital learning environment has increasingly important role in the veterinary curriculum. InGNeoSA™ is an interactive e-gaming tool developed at the Faculty of Veterinary Medicine of Universiti Putra Malaysia to facilitate teaching and learning in small animal oncology. InGNeoSA™ is intended for final year Doctor of Veterinary Medicine (DVM) students. To play, students should have completed basic radiology, anatomy, physiology, canine and feline medicine and clinical pathology; histopathology and diagnostic imaging subjects which are relevant to clinical oncology. InGNeoSA™ was developed using the Unity® 2017.1, online 2D application based on oncology cases presented to the University Veterinary Hospital of UPM. It is equipped with background music, score database and time management elements; and players can compete and rank by scores. This game require specific login information which enable students to play and engage interactively at their convenience. There are 6 Gaming Rooms which include: CANCHIST (history of cancer, metastasis, terminologies), TUMBIOL (differentials, fundamental cancer biology), GUESS THE TUMOUR (images of animals with tumour and likely diagnosis), IMAGINE (puzzles on diagnostic imaging), HISCYTO (histopathology, cytology), and CHEMOX (clinical pathology, chemotherapy, toxicities). Each room has a total score of 100 which can be used as assessment. In conclusion, InGNeoSA™ is a useful tool to facilitate learning in small animal oncology in the DVM curriculum. This game make student centered learning fun, time saving, visually appealing, reduce utilization of printed materials in addition to tapping student's affinity towards the use of media technology in learning oncology. Students found the game very colourful, informative, exhilarating and engaging!

Key words: Gamification, animal, cancer education, veterinary medicine, engaging

Content

Educational games in digital learning environment has increasingly important role in the veterinary curriculum. InGNeoSA™ is an interactive e-gaming tool developed at the Faculty of Veterinary Medicine of Universiti Putra Malaysia to facilitate teaching and learning in small animal oncology. Veterinary Oncology can be a heavy subject taught in veterinary schools because of the complexity to recognize various types of cancer, the methods to diagnose and clinical management of cats and dogs with cancer as well as dealing with end-of-life related matters. Veterinary Oncology covers a diverse related fields, from understanding basic cancer biology (fundamental), histopathology classifications of tumours, variable clinical presentations of tumours in cats and dogs, diagnostic investigations required, treatment strategies and clinical outcomes.

InGNeoSA™ is intended for final year DVM students. To play, students should have completed basic radiology, anatomy, physiology, canine and feline medicine and clinical pathology; histopathology and diagnostic imaging subjects which are relevant to clinical oncology. Gamification approach was incorporated in teaching and learning of veterinary oncology using digital gaming media. InGNeoSA™ strives to make student-centered learning fun, time saving, visually appealing, reduce utilization of printed materials/papers in addition to tapping student's affinity towards the use of media technology in learning veterinary oncology.

This game was developed under the Incentive Grant for Teaching and Learning (GIPPUPM- 2016) by the Centre for Academic Development (CADE) of UPM. This game is available online with specific login requirement, which enables students to play and engage in this game at a time convenient to



them. InGNeoSA™ was developed using the Unity© 2017.1, online 2D application based on oncology cases presented to the University Veterinary Hospital of UPM. It is equipped with background music, score database and time management elements; and players can compete and rank by scores. This game require specific login information which enable students to play and engage interactively at their convenience. Consents were received from various parties involved.

The game can be played on any device such as PC, laptop but currently not available on mobile application mode and not for Mac users. There are 6 Gaming Rooms which include: CANCHIST (history of cancer, metastasis, terminologies), TUMBIOL (differentials, fundamental cancer biology), GUESS THE TUMOUR (images of animals with tumour and likely diagnosis), IMAGINE (puzzles on diagnostic imaging), HISCYTO (histopathology, cytology), and CHEMOX (clinical pathology, chemotherapy, toxicities). Each room has a total score of 100 which can be used as assessment. The game best played individually however paired team players are encouraged to stimulate learning as well. Scores from each Gaming Room and Levels will be submitted to the online database which allows students to compete with each other to achieve top scores. Users can login the database to view the HIGH Score LIST with Ranks.

InGNeoSA™ has high potential commercial value through licensing to other veterinary schools in the world, since it is the first of its kind. The images of dogs and cats with cancer is from real-life cases presented in veterinary hospital in Malaysia and prepares learners for the real clinical situation upon graduation. In December 2017, 118 DVM 5 final year students played the game as one of the Student Centered Learning activities within the course VPD4971 Problem Solving in Diseases. Students were found to be completely engaged with learning for the entire 3 hours session. Positive feedbacks and comments were received from the students and veterinarians at the University Veterinary Hospital and postgraduate students who trialed the game. The student scores were tabulated and incorporated as marks (10% for this course). The students could play the games over again to reinforce the knowledge they will learn in oncology. This game has been now part of the course and will be used annually by veterinary undergraduate students.

In January 2018, InGNeoSA won Gold at K-Novasi UKM and a second Gold at the Putra InnoCreative Competition in PICTL-UPM in August 2018. InGNeoSA™ is a useful tool to facilitate learning in small animal oncology in the DVM program. This game make student centered learning fun, time saving, visually appealing, reduce utilization of printed materials in addition to tapping student's affinity towards the use of media technology in learning oncology. Students found the game very colourful, informative, exhilarating and engaging!

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ID NO. UPM002
TOPIC: MEMPERKASAKAN GAMIFIKASI DALAM HIEPS 4.0 MPU VIA 'TOOLS' HEUTAGOGI
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Abstrak

Konsep 'heutagogi' merupakan pembelajaran tentang belajar yang ditentukan oleh diri pelajar itu sendiri. Konsep ini pertama kali dicipta oleh Steward. Heutagogi berpusatkan kepada penambahbaikan belajar dan cara belajar, dua hala dalam pembelajaran, kesempatan belajar secara global, proses pembelajaran yang tidak bergantung kepada pensyarah semata-mata, dan memperkasakan jati diri pelajar. Heutagogi dibangunkan berasaskan pendekatan humanistik dan pendekatan belajar. Heutagogi menawarkan bagaimana pelajar belajar sendiri, menjadi kreatif, memiliki impak diri yang tinggi, dapat menerapkan kompetensi dalam situasi kehidupan, dan dapat bekerja sama dengan orang lain. Pendekatan heutagogi menekankan pada sifat manusiawi sumber daya manusia, nilai diri, kemampuan, serta mengakui sistem pembelajaran dan aktiviti belajar sebagai lawan daripada mengajar. Heutagogi menempatkan pelajar benar-benar bertanggungjawab atas apa yang dipelajari dan semasa mereka belajar, serta menyediakan kerangka kerja bagi pembelajaran yang melibatkan pensyarah dan pelajar yang bertanggungjawab untuk lebih maju dalam pembelajaran. Sementara Gamifikasi pula merupakan pendekatan yang menggunakan kaedah permainan dalam proses pengajaran dan pembelajaran (P&P). Gamifikasi dalam HIEPS 4.0 menggunakan perkakasan Web.20 menjadikan proses pengajaran dan pembelajaran (P&P) menjadi lebih menarik, interaktif dan 'engaging'. Para pensyarah boleh menggunakan konsep gamifikasi dan diterapkan di dalam bilik kuliah bersama para pelajar dengan menggunakan pelbagai 'tools' antaranya kahoot (<https://getkahoot.com/>), quizalize (<https://www.quizalize.com/>), quizziz (<http://quizizz.com/>), socrative (<http://www.socrative.com/>), peardeck (<https://www.peardeck.com/>), cram (<http://www.cram.com/>), quizlet (<https://quizlet.com/>), thatquiz (<https://www.thatquiz.org/>) dan juga 'tools' heutagogi antaranya padlet, gripflip, camtasia, dan lain-lain. Aplikasi ini amat menjimatkan dan memudahkan proses pembelajaran dengan begiti interaktif, komunikatif dan afektif.

Key words: *Memperkasakan, Gamifikasi, HIEPS 4.0, MPU, 'Tools' Heutagogi*

Pengenalan

Keterlibatan dalam belajar (learning engagement) merupakan proses transformative jika pelajar mengalami perubahan diri melalui proses belajar. Antara yang dipraktikkan adalah pembelajaran dalam bentuk gamifikasi. Gamifikasi dalam pendidikan merupakan kaedah pembelajaran berasaskan permainan. Gamifikasi berupaya menarik minat pelajar belajar secara aktif, ketagih belajar dan sumber rujukan kepada para pensyarah disamping pendekatan terbaik yang memfokuskan aspek permainan dalam aktiviti pengajaran dan pembelajaran di dalam bilik kuliah. Istilah 'Gamifikasi' diambil daripada bahasa Inggeris yang bermaksud proses menjadikan sesuatu aktiviti yang asalnya bukan permainan sebagai aktiviti bermain. Aplikasi QR CODE (QR), Argummented Reality (AR), Flipgrid (FGD) berupaya melibatkan pembelajaran interaktif dan aktif disamping aplikasi penilaian yang cukup 'superskill' antaranya , Kahoot it, Socrative, Mentimeter, Quizziz, Quizlet live dan lain-lain. Ia sepatutnya dikuasai pensyarah di Era Pendidikan Industri Cybergogi dan Digital 4.0 ini. Berdasarkan temu bual secara rawak kepada pelajar dan pensyarah yang mempraktikkan gamifikasi dalam aktiviti pembelajaran secara umumnya menunjukkan 'gamifikasi' menggunakan pelbagai pendekatan video, AR, QR dan e-quiz menjadi alat bantu mengajar yang interaktif dan bersifat simulasi, pengganti eksperimen, mampu menjelaskan tajuk-tajuk kuliah, membantu dalam penerangan proses dalam bab kuliah yang diajar,

penganti objek 'maujud' (reality), berupaya menarik perhatian pelajar, menggambarkan sesuatu secara jelas, penjelasan konsep yang idela dan jelas, kaedah penilaian yang objektif, dapat meningkatkan tahap motivasi pelajar, memberikan impak positif terhadap pengalaman pembelajaran terutama bagi pelajar lemah. Situasi pendidikan 4.0 ini amat sesuai untuk Gen Z Alfa melibatkan diri secara aktif menerusi media pengajaran ini yang menepati pandangan Gagne, Wager, Golas dan Keller (2005) yang menyatakan tiada mana-mana media pengajaran yang lebih baik berbanding dengan media pengajaran lain, malah setiap median pengajaran memiliki kelebihan masing-masing dalam mewakili objek, fakta, idea, proses, aktiviti manusia, model perwatakan, hubungan ruang atau dalam pembangunan kemahiran psikomotor, kognitif dan afektif. Gamifikasi, AR, QR Code dan FlipGrid juga dapat membantu dalam pembangunan pemikiran kreatif, meningkatkan kefahaman dan menukar paradigm kaedah pembelajaran pelajar untuk mempelajari setiap kursus yang diajar. Disamping mampu memberikan pengalaman pembelajaran baharu yang menghiburkan, menggalakkan pelajar melakukan eksplorasi sendiri berdasarkan tajuk yang dipelajari dan menjimatkan masa pelajar menguasai sesuai ilmu serta alternatif kepada pensyarah untuk mempraktikkan sebuah media pengajaran dan pembelajaran dalam bilik-bilik kuliah yang lebih interaktif, menarik dan berkesan serta membantu kognitif pelajar terhadap kursus yang diajar

Objektif & Kepentingan

- meningkatkan kualiti pelajar belajar dengan aktif dan berkesan
- interaksi seorang pendidik dan peserta didik dapat dilakukan dengan jarak jauh atau tidak langsung berhadapan.
- melaksanakan proses pembelajaran dengan mahapelajar yang lebih ramai dan tidak mengenal batas tempat, sehingga proses pembelajaran dapat dilaksanakan secara bersamaan di mana-mana dan bila-bila pun sesuai keinginan pelajar dan pensyarah

Metodologi

Pembelajaran transformatif juga berupaya mengubah persekitaran domain dan pembelajaran apabila pensyarah bertindak melakukan perubahan strategi dalam pengajaran serta menerapkan aktiviti yang ideal dalam Pembelajaran Transformatif antaranya :

- meningkatkan rasa keamanan, keterbukaan serta kepercayaan semasa proses pembelajaran berlangsung
- merekabentuk situasi pembelajaran yang demokratik , terbuka, rasional, memiliki akses kepada semua informasi yang ada serta mengutamakan refleksi kritis.
- bersedia berkongsi pengalaman pelajar sebagai sebahagian dari[pada proses pembelajaran dan mengutamakan hak asasi pelajar yang ingin berkongsi pengalaman secara peribadi atau professional
- memastikan kaedah SCL (Student Cetered Learning) secara afektif yang mengutamakan pembelajaran berpusatkan pelajar, memberi autonomi kebebasan bersuara atau mengeluarkan pandangan pelajar, mewujudkan keterlibatan dan kerjasama antara para pelajar.
- mewujudkan suasana refleksi diri dan penilaian diri
- akhir sekali dengan mewujudkan kumpulan-kumpulan pelajar dalam mana-mana kuliah untuk tujuan pencarian maklumat, tugasan, perbincangan dan pembentangan tugasan. Dalam kumpulan pelajar inilah adanya ruang antara ahli untuk untuk saling mengenal latar belakang budaya daripada ahli yang berbeza budaya, melahirkan penghargaan serta menghilangkan salahfaham atau konflik sesama ahli
- Pensyarah juga bukan lagi sebagai guru yang mengajar tetap sebagai fasilitator yang memudahcara semasa proses pembelajaran berjalan. Pada masa yang sama para pensyarah perlu memastikan diri mereka dapat dipercayai, bersikap empati, peduli, mempertahankan keaslian, jujur dan menunjukkan integriti tinggi

Praktikaliti dan Kegunaan

- dapat belajar di mana saja sesuai dengan kecepatan belajar dan kondisi yang dimiliki karena mata pelajaran akan selalu tersedia dalam jaringan komputer dan Internet.
- pelajar memiliki akses yang luas terhadap berbagai sumber belajar yang tersedia.
- memberikan kesempatan kepada pelajar untuk berinteraksi dengan pelajar lainnya, dengan tutor, dan atau dengan masyarakat belajar dan sumber belajarnya. Hal ini menunjukkan bahwa

virtual learning memberikan kesempatan kepada pelajar untuk melakukan berbagai interaksi dan berkolaborasi dengan pelajar lainnya.

- pelajar dapat menggunakan cara yang seragam dan sesuai untuk mengakses sumber yang sangat banyak di Internet
- pelajar menguasai informasi yang disajikan dalam berbagai sumber belajar dalam Internet, pelajar juga akan memiliki keterampilan dalam menggunakan berbagai sumber belajar tersebut
- Materi yang disajikan secara online mudah untuk diperbaharui dan dimodifikasi. Oleh karena itu, pelajar akan selalu memperoleh informasi yang terkini.
- Internet mendorong belajar aktif dan memfasilitasi keterlibatan pelajar secara intelektual dengan materi pembelajaran
- Penggunaan Asynchronous Learning Networks menyediakan berbagai pengalaman belajar dan mengakomodasi gaya belajar pelajar yang berbeda
- Secara ekonomis, pelajar dapat tetap tinggal di rumah tanpa harus mengeluarkan biaya untuk transportasi dan akomodasi. Selain itu, pelajar juga dapat tetap bekerja, tidak perlu kehilangan pekerjaan, sambil menyelesaikan studinya sesuai dengan kecepatan belajarnya dan waktu yang dimilikinya.

Kesimpulan

Pembelajaran transformatif dilaksanakan dalam bilik kuliah dengan tools web 2.0 yang disediakan secara percuma untuk tujuan pembelajaran abad 21 di atas talian. Terdapat banyak bahan pembelajaran, perkongsian maklumat daripada pelajar boleh diakses secara mudah tanpa melibatkan kos dan dana yang besar. Penilaian tugas juga boleh dilaksanakan secara atas talian dan semua aktiviti yang diberikan pensyarah boleh dimuatnaik atas talian sudah pasti menjimatkan masa, kos, kertas dan masa

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ID NO. UPM003
TOPIC: PROJEK PENGAJARAN 'VIRTUAL LEARNING' KURSUS MOOCTITAS KE ARAH PENDIDIKAN INDUSTRI 4.0
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Abstrak

Projek Pengajaran 'Virtual Learning' direka bagi menyediakan pengajaran alaf 21 dan industri pendidikan 4.0. Pelajardan pensyarah Kursus MOOCTITAS yang datang daripada berbagai universiti terlibat secara langsung dan 'live' serta dapat bersama-sama dengan mengaplikasikanpelbagai perkakasan Web 2.0 Kumpulan "Virtual Group MOOCTITAS' boleh menyumbangidea, bahan pengajaran, latihan danaktiviti antara berbagai-bagai universiti tanpa sempadan dan berbincang secara interaktif dan afektif berdasarkan tajuk-tajuk kursus pada semester yang diajar. Antara objektif utama 'Projek Pengajaran berasaskan "Virtual Learning' adalah untuk mempraktikkan teknologi dan perkakasan digital dan menambahkan pengalaman pengajaran dan pembelajaran serta objektif kedua adalah untuk membina 'mindset' bahawa setiap universiti awam atau swasta boleh melakukan kolaborasi dalam P & P antara satu samalain walaupun lokasi universiti agak jauh dan yang terakhiradalah untuk membangunkan komuniti pengajaran digital dalam pendidikan tinggi dan amalan terbaik dalam pendidikan tinggi Malaysia.

Kata kunci:Projek, Pengajaran 'Virtual Learning', Kursus MOOCTITAS Pendidikan, Industri 4.0.

Pengenalan

Virtual Learning adalah salah satu sistem pendidikan jarak jauh yang bertujuan untuk menyemak semula dan memberi kesan terhadap metod pengajaran dan pembelajaran dengan menggunakan internet. Jarak dan waktu tidak lagi menjadi masalah dalam proses pembelajaran berasaskan konsep Virtual Learning ini. Dalam sistem pembelajaran melalui internet ini, isi pembelajaran disampaikan secara online. Dalam sistem pembelajaran ini juga mahapelajar/i berupaya untuk berdiskusi, belajar, bertanya, menjalani aktiviti dan mengerjakan latihan secara atas talian (online). Semua proses pembelajaran dapat dilakukan tanpa menuntut mahapelajar/i hadir di ruang kelas tertentu, tetapi mereka berinteraksi satu sama lain untuk mendiskusikan pelajaran seperti yang terjadi di kelas biasa

Objektif & Kepentingan

- meningkatkan kualiti pelajar belajar dengan aktif dan berkesan
- interaksi seorang pendidik dan peserta didik dapat dilakukan dengan jarak jauh atau tidak langsung berhadapan.
- melaksanakan proses pembelajaran dengan mahapelajar yang lebih ramai dan tidak mengenal batas tempat, sehingga proses pembelajaran dapat dilaksanakan secara bersamaan di mana-mana dan bila-bila pun sesuai keinginan pelajar dan pensyarah

Praktikaliti dan Kegunaan

- dapat belajar di mana saja sesuai dengan kecepatan belajar dan kondisi yang dimiliki karena mata pelajaran akan selalu tersedia dalam jaringan komputer dan Internet.
- pelajar memiliki akses yang luas terhadap berbagai sumber belajar yang tersedia.
- memberikan kesempatan kepada pelajar untuk berinteraksi dengan pelajar lainnya, dengan tutor, dan atau dengan masyarakat belajar dan sumber belajarnya. Hal ini menunjukkan bahwa virtual learning memberikan kesempatan kepada pelajar untuk melakukan berbagai interaksi dan berkolaborasi dengan pelajar lainnya.
- pelajar dapat menggunakan cara yang seragam dan sesuai untuk mengakses sumber yang sangat banyak di Internet
- pelajar menguasai informasi yang disajikan dalam berbagai sumber belajar dalam Internet, pelajar juga akan memiliki keterampilan dalam menggunakan berbagai sumber belajar tersebut
- Materi yang disajikan secara online mudah untuk diperbaharui dan dimodifikasi. Oleh karena itu, pelajar akan selalu memperoleh informasi yang terkini.
- Internet mendorong belajar aktif dan memfasilitasi keterlibatan pelajar secara in-te-lek-tual dengan materi pembelajaran
- Penggunaan Asynchronous Learning Networks menyediakan berbagai pengalaman belajar dan mengakomodasi gaya belajar pelajar yang berbeda
- Secara ekonomis, pelajar dapat tetap tinggal di rumah tanpa harus mengeluarkan biaya untuk transportasi dan akomodasi. Selain itu, pelajar juga dapat tetap bekerja, tidak perlu kehilangan pekerjaan, sambil menyelesaikan studinya sesuai dengan kecepatan belajarnya dan waktu yang dimilikinya.

Kesimpulan

Pembelajaran secara 'Virtual Learning merupakan "Persekitaran Pembelajaran Maya" yang terdiri daripada ciri-ciri seperti ruang maklumat yang direka, ruang sosial menjadi "tempat", peserta yang aktif dan interaktif. Persekitaran pembelajaran maya tidak menjamin keberkesanan. Ia mesti disepadukan dengan senario pedagogi yang kaya dan senario ini mesti mendapat kebaikan dari pelbagai ciri pengajaran yang baik. Konsep "persekitaran pembelajaran maya" memerlukan pendekatan yang inovatif, menarik dan mudah digunakan..

Penghargaan

Kami mengucapkan ribuan terima kasih kepada pihak Pusat Pembangunan Akademik. Atau CADe UPM kerana meluluskan Geran Insentif Pengajaran dan Penyelidikan (GIPP) daripada tahun 2016-2018. dengan Nombor Projek ID 9323682

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ID NO. UPM 004	TOPIC: HOW MOBILE E-BOOKS AFFECT THE LEARNING PROCESS OF MATHEMATICS POSTGRADUATE STUDENTS

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Abstract

The trend in the academic circle shows that mobile e-books in the areas of business, management, engineering and medicine are more popular compared to mathematics and pure sciences (Littman & Connaway, 2004). Existing literature has reported on the use of mathematics e-book via computer and laptop but there is limited research on the use of mathematics e-book via hand held mobile devices (mobile e-book). The studies on mathematics e-book also indicate that students mostly did not prefer to use them due to various reasons (Jalal, Mohd Ayub and Tarmizi, 2014; Letchumanan and Tarmizi, 2011). Meanwhile, in the mathematics learning environment, it is reported that university students faced difficulties in understanding mathematics concepts (Ferrer, 2016). It is believed that mobile e-books could assist these learners to learn the mathematics concepts better (Taleb, Ahmadi & Musavi, 2015). Insufficient evidence that shows the mobile e-book capable of delivering effective learning environment to the mathematics students could be the reasons that hinder the learners from using the mobile e-book. Hence, this study aims to understand how the adoption of mobile e-book affects the way the mathematics postgraduate students learn. The study employed qualitative case study design. Based on the purposive sampling method, eight mathematics postgraduate students voluntarily participated in the study. This study uses the mobile e-book platform that available online at the university library. The mobile e-book used is related to the field of Abstract Algebra. Data for this study were collected through semi-structured interviews and non-participant observations. The data were analysed by using constant comparative method. The findings showed that mobile e-book can increase student-content interaction, promote student-instructor interaction, assist in understanding a subject from different perspectives and change the way of reading or learning. The findings of this study can help the students, academicians, mobile e-book designers and non-mobile e-book users to increase their understanding on the effect of mobile e-



book to learning activities. This study can also provide a foundation for policy making in education to administer plans to support and improve the use of mobile e-book among the mathematics postgraduate students.

Keywords: mobile learning, interaction, active learning, learning style, algebra

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Abstract: Theoretically, learning Japanese language vocabulary with animated karaoke is based on the Dual-coding Theory (DCT). DCT was initially proposed by Paivio (1986) who stated that language knowledge is a process in both the verbal and visual channels to make learning more fun and enjoyable. Studies have also shown that nonverbal code offers substantially more support than the verbal code with regard to memory (Paivio, 1971; Paivio & Lambert, 1981; Paivio, 1991). Höffler et al (2010) noted that if visual hints such as animation can be added to songs, the process of learning a foreign language would be easier and faster because learners are able to understand the context of the vocabulary by hearing and visualising the meaning. Therefore, if learners could process information from both the visual and auditory sense modalities, learning would be more efficient and effective. Animated karaoke provides multiple modalities to meet the needs of aural, visual, tactile and kinaesthetic learners that can contribute to the motivation level of students in a positive way. In a multimedia instructional environment, learners are exposed to materials in a verbal (such as onscreen texts or narrations) as well as visual form (Mayer, 1987). The animated karaoke transfers information to the learners through three channels which are audio, video and text. As the use of karaoke and animation in previous studies showed a positive effect in improving students' vocabulary acquisition, this may suggest the possibility of using animated karaoke as an effective learning material in the classroom teaching and learning of Japanese language.

Key words: *animated karaoke, vocabulary acquisition, foreign language, Japanese language learning.*

Invention

Animated Karaoke Assisted Vocabulary Learning was developed by incorporating the desirable features of karaoke into each sing-along multimedia screen page, which is designed with following technical features:

- Animation from still images.
- Synchronization of the animation with the sung vocals.
- Correct display of the text lyrics in Hiragana/Katakana script that is viewable by Japanese language learner.
- Correct display of the text lyrics in "transliteration" using Romanization for foreign consumer.
- Synchronization of the highlighting of the words in the text lyrics with words being sung.

It is difficult to use commercially available Japanese karaoke songs due to issues such as no standardised transliteration and proper language styles, the visual accompanying the lyric texts does not reflect the meaning relevant to the song and the vocal is not clearly pronounced and is too fast for beginners. The

commissioned singer was coached by a Japanese lecturer to ensure the clarity of pronunciation and fluency of the singing.

Process of Invention

The songs are performed by a commissioned singer and musicians to control the pace and speed of the singing. The commissioned singer was coached and guided by a Japanese lecturer for a few days to ensure clarity of pronunciation and fluency prior to the actual recordings.

The five songs included in the projects are:

1. はい、どうぞ (Hai, douzo)
2. あいさつの うた (Aisatsu no Uta)
3. ひにちを おぼえよう (Hinichi wo Oboyoyou)
4. すうじを かぞうよう (Suuji wo Kazouyou)
5. しつもんを しょう (Sitsumon wo Shiyoyou)

The recorded songs were then sent to an animation studio so that an animated karaoke of each song could be designed and created by professional animator programmers and developers. The whole project took about a year to accomplish before the copyright of the project was transferred to the researcher by the composer and animation studio after they were paid using a research grant provided by UPM. The complete set of animated karaoke was used as learning materials to help learners acquire the vocabulary to achieve the aims of this research in determining whether the use of animated karaoke in Japanese language classes influences vocabulary acquisition among Malaysian Japanese language learners.

Advantages

The types of songs that are made into these animated karaoke are designed according to these advantages:

- ✚ The lyrics were selected and written based on vocabulary items that are appropriate for beginning learners of Japanese language.
- ✚ The sung vocals are performed by a local commissioned singer and musician for control of the pace and speed of the sung songs.
- ✚ The animated karaoke songs have lyrics as text in Hiragana/ Katakana script and transliteration script to suit the learners from both Japanese and non-Japanese language learners.

Market Potential/ Commercialization

- ❖ The first Japanese Animated Karaoke that were created and developed 100% by Malaysians. 1.5 million Japanese language learners in South East Asia provide huge market for this product. The content is made to suit the learners' purposes, needs and the language level and skill to be taught.

i. Industry

- ❖ Malaysian can use local product which is more cost effective than imported product which is more expensive.
- ❖ Produced by local content designer and maker.

ii. End user



- ❖ Targeted for Pre-schools, Primary and Secondary schools, Colleges and Universities and those who are interested in learning Japanese language locally and internationally.

Conclusion

Animated karaoke have been found to be useful in enhancing students' motivation, particularly in acquiring new vocabulary in the Japanese language. As the activity is fun, their anxiety level is reduced and thus, improves their language acquisition especially when learning a difficult language such as Japanese. To succeed in learning the Japanese language, it is important that the students remain eager to learn and participate in class activities. The implication of the study is that lecturers should adopt the use of animated karaoke or other fun activities to help students acquire the target vocabulary items in the Japanese language classrooms

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ID NO. UPM006

**TOPIC: INTERACTIVE MULTIMEDIA WEBSITE IN LEARNING
BASIC JAPANESE**

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Abstract:

This web based learning project is developed to enable user to learn Basic Japanese language vocabularies and grammar using e-learning platform application. Incorporating multimedia, such as, animation, songs, graphic, movie and internet might prove to be successful in turning the traditional classrooms to communicative as well as student-centered classrooms. Therefore, media such as movies or documentaries are among the best means for providing authentic speech and conversations. They are a "replica" of everyday dialogue. This will lead to a better foreign language teaching and learning experience (Yun, 2014). This web site has been developed into two topics which is "Self -Introduction" and "How much is it?" Each topic consist six modules, i.e. Lesson module, vocabulary module, grammar module, country/ building module, conversation module and quiz module. The expected outcomes from these six modules after completing the lessons is to ensure users will be able to read, write, speak and listen at beginner level. The lesson module consist the sentence pattern which the users has to acquire for each topic developed for this website. The vocabulary module introduce the vocabulary item in flash cards to assist users to learn them in Japanese and English. The grammar module highlight the grammar aspect to be learned in each topic. The country/building module are designed in animated dialogues to learn simple dialogue in fun ways. The conversation module is designed for more complex dialogue using animation. In the quiz module, user can take a quiz to test their understanding in basic Japanese language. Overall, the user satisfaction towards the usability of the website has been proven through the results of the questionnaire distributed to them.

Key words: *Interactive, multimedia, website, Japanese language, language learning.*

Content

This web based learning project is developed to enable user to learn Basic Japanese language vocabularies and grammar using e-learning platform application. Incorporating multimedia, such as, animation, songs, graphic, movie and internet might prove to be successful in turning the traditional classrooms to communicative as well as student-center classrooms. Therefore, media such as movies or documentaries are among the best means for providing authentic speech and conversations. They are a "replica" of everyday dialogue. This will lead to a better foreign language teaching and learning experience (Yun, 2014). This web site has been developed into two topics which is "Self -Introduction" and "How much is it?" Overall, the user satisfaction towards the usability of the website has been proven through the results of the questionnaire distributed to them.

Objective

- Learners can learn by themselves anywhere and anytime on e-learning platform;

- As supplementary material on learning basic Japanese vocabulary and grammar outside lecture;
- There are evaluation tools such as quiz to facilitate the progress of the learners in each topic.

Value Added

Each topic consist six modules, i.e. Lesson module, vocabulary module, grammar module, country/building module, conversation module and quiz module. The lesson module consist the sentence pattern which the users has to acquire for each topic developed for this website. The vocabulary module introduce the vocabulary item in flash cards to assist users to learn them in Japanese and English. The grammar module highlight the grammar aspect to be learned in each topic. The country/building module are designed in animated dialogues to learn simple dialogue in fun ways. The conversation module is designed for more complex dialogue using animation. In the quiz module, user can take a quiz to test their understanding in basic Japanese language.

Usefulness

- ❖ The expected outcomes from these six modules after completing the lessons is to ensure users will be able to read, write, speak and listen at beginner level.
- ❖ In terms of contents and presentations, the students' response showed that a well presented lesson is due to its interactions with learners and content relevancy.
- ❖ The interactive online multimedia instruction on basic Japanese lesson could help students understand and know Japanese vocabularies and grammar.

Commercialization

Potential

The first Interactive Multimedia Website that were created and developed 100% by Malaysians. 1.5 million Japanese language learners in South East Asia provide huge market for this product. The content is made to suit the learners' purposes, needs and the language level and skill to be taught. Targeted for Pre-schools, Primary and Secondary schools, Colleges and Universities and those who are interested in learning Japanese language locally and internationally.

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ID NO. :UPM 007

TOPIC: “Micro world” - Informative One Health Scenic Model

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Abstract

Lately, there are increased numbers of infectious diseases in human that are associated with animals, widely known as zoonotic diseases. One health concept acknowledges the relationships between animals, human and the environment and can be a strategy for the prevention of zoonotic infections. The aim of our project is to create awareness among young learners on zoonotic diseases through one

health approach by using a scenic model which is integrated with mobile technology and augmented reality. A 3D scenic model representing a semi-urban area in Malaysia is built using 50% recycle and tangible apparatus. We incorporate mobile technology that allows the participants to scan the elements such as the animals, plants and the area that may cause diseases. They will be required to download an application created for the model. Upon scanning of the relevant items, information about the diseases in the form of either text, animated visual or audio about the diseases will appear. Designing an intervention method by combining both conventional and technology elements will potentially develop the interest in these young learners which will result in public awareness of the diseases and their preventions. When the participants have explored the scenic model, they will be asked to complete a crossword puzzle to determine their knowledge on the topic. Participants perception of the model as a learning tool will also be determined from their feedback.

Keywords: *one health, scenic model, augmented reality, mobile technology, young learners*

Content

One health concept acknowledges the relationships between animals, human and the environment and zoonotic diseases. The significant morbidity and mortality of zoonoses in human especially in the developing countries such as Malaysia, India and Africa pose a major challenge to the public health sector worldwide (Costa et al., 2015; Crim et al., 2014). Previous studies showed that preventive measures using one health approach contributed to a better outcomes rather than focusing on just the host or target of the diseases (Falzon et al., 2018, Kahn, Kaplan, Monath, & Steele, 2008).

The aim of our project is to create awareness on zoonotic diseases through education by using a scenic model incorporated with mobile technology and augmented reality. Infusion of technology with scenic model does not only require participants to use their sensory and visualization for the learning activities but also focus on the message delivered which contributes to an active learning surrounding. A meta-analysis study by Freeman in 2014 showed that active learning among the university students in hard core subjects was associated with reduced number of failures (Freeman et al., 2014). Therefore, addition of technology value in the scenic model will help to draw attention of the young learners which are our target participants.

According to the British council, young learners are defined as the people aged below 25 years old. They are not only a group of people that has high enthusiasm and passionate in learning something new, they are also categorized as the digital native. Digital native is a person that grew in digital era and familiar with the gadget and technology ("A Declaration of the Independence of Cyberspace | Electronic Frontier Foundation," n.d.).

Lately, there are an increased numbers of infectious diseases in human that are associated with animals (The Star Online, 2018). These diseases are widely known as zoonotic diseases or zoonoses ("WHO | Zoonoses and the Human-Animal-Ecosystems Interface," 2017). They are caused by microorganisms such as bacteria, parasites, fungi, arthropods, prion and viruses. Wide ranges of animals have been identified to be the hosts of the pathogens, which include the wildlife and stray animals, as well as pets. In this modern era, the close relationship between human and animals which in some cases the latter become the companions of the former, poses a risk for disease transmission. This is in view that pets have been identified to transmit more than 60 zoonotic agents (Macpherson, 2005).

In view of a limited exposure on one health approach in Malaysia in spite of increasing number of transmitted diseases due to animals, an intervention on the zoonotic diseases using one health concept should be introduced. Thus, a 3D scenic model representing a semi-urban area in Malaysia is built. This model consists of animals which are within the semi-urban environment. The view simulates the surrounding in our country; hence participants are able to relate to the real life scenario. The model is made up of tangible apparatus that allows the participants to touch the elements in the model. Not only

the model allows the sensory sense to be used, it is also an eco-friendly model in which 50% of the materials are from the recycle materials, making it a cost effective learning model.

Since the participants for our project are young learners, we incorporate mobile technology to the model and turn it into an e-learning-based model. Mobile device is chosen as it is portable and able to scan the elements in the model. Furthermore, a mobile device is usually one of the must bring along items for everyone. Participants will be able to scan the elements such as the animals, plants and the area that may cause diseases. They are required to download an application created for the model. Upon scanning of the relevant items, information in the form of either, text, animated visual or audio about the diseases will appear. The integration of e-learning would hopefully engage and attract participants' interest in learning more about human health that is associated with animals and the environment.

In order to ensure that participants receive diverse information on zoonotic diseases, we include different types of zoonoses that are commonly found in Malaysia. The agents, hosts as well as the routes of transmissions are included to allow us to educate more about the diseases and eventually create awareness on human health by one health concept, to the participants.

Besides the integration of technology, we also incorporate gamification aspect into the model as it is a blooming trend in many sectors including education (Busch et al., 2015). Gamification in learning will eventually cause a huge impact on the audience motivation and engagement toward the information delivered (Muntean, 2011). Emerging technology and gamification into an education process indirectly create an active learning environment. These learning activities require the participants to participate in the learning process rather than just lecture-based activity which is passive learning (Bonwell & Eison, 1991). In this modern era, e-learning elements have become the essentials tools for teaching and learning (Romiszowski, 2003).

When the participants have explored the scenic model, they will be asked to complete a crossword puzzle to determine their knowledge on the topic. Participants perception of the model as a learning tool will also be determined from their feedback.

We hope that this method will become an effective intervention strategy for zoonotic diseases as well as other health-related problems that can be applied in the future. In the future, this project can be one of the effective methods in creating public awareness especially among younger generations at different level of education in our country. A new method of delivering the information with the aid of technology is expected to attract the audiences to know more about zoonotic diseases and indirectly prevent the diseases from spreading quickly. The potential use of this model as a learning tool gives an opportunity for it to be commercialized and we can collaborate with companies to market the products nationwide.

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ID NO. UPM 008
TOPIC: UML DIAGRAM LEARNING TOOL
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Abstract: Educators in most universities have always used the Unified Modeling Language (UML) in teaching object-oriented modeling. There are many UML tools to support the teaching of UML. However, these tools are mostly focused for professional developers and not for educational purposes. There are several challenges for educators in teaching students about UML diagrams as reported by several studies. A major concern from previous studies is that UML is a complex language and students have difficulty in modelling UML diagrams. There are general guidelines for creating UML diagrams. However, the same common mistakes are made by most students. Sufficient practices of UML can enhance students' knowledge and skills in UML diagrams. Thus, to address the challenges in teaching object-oriented models (specifically the UML diagrams), we propose a UML Diagram Learning (UDL) tool to help the computer science students in learning and drawing the UML diagrams. The UML Diagram Learning tool provides automated error detection for UML use case and class diagrams. The objective of the UDL tool is to check and detect diagram errors of use case and class diagrams created by users/students. Notification of diagram errors consists of error description, element name and element type is given to the users. This will allow users to improve/fix the diagrams errors. The UML Diagram Learning tool is an educational tool with the aim to improve understanding and promote self-learning about UML diagrams. The UML diagram learning tool could also support the students and educators in the teaching and learning of UML diagrams.

Key words: *UML diagrams, UML tool, UML education, Modeling, Software engineering education.*

Introduction

Models are not new in software engineering. Software engineers have been using models to manage the complexity of software systems and to communicate ideas [ref1-studentUMLRamolari, ref2-]. One of the modeling languages that are widely used in industry and academia is the Unified Modeling Language (UML). UML is a standard modeling language, intended to support users in specifying, visualizing and documenting models of software systems (Booch). Amali & Bernard [ref] reported that an important and needed skill from a software engineer is to be able to use UML to model software systems. Thus, the skill of modeling is also important for students who plan to involve in the software engineering career [ref2-akayama, ref 3-Ludwik Kuzniarz, Jürgen Börstler, ref 3-Amali weerasinghe 2015]. The UML has been used by most universities that have Computer Science and Software Engineering programs which offer several courses about design and modeling. The UML has always been associated with modeling for object-oriented applications and development of software applications. Therefore, most universities educators will employ the UML notation in teaching object-oriented modeling. Despite the wide acceptance of UML in academic community, several studies have reported that UML is a complex language and students have difficulty in modeling UML diagrams [refs]. Thus, to address these challenges, we aim to develop a prototype of UML Diagram Learning (UDL) tool to support the students in learning and drawing

the UML diagrams via automated error detection features. The following section explains the background and motivation of the work, our innovation approach, the importance to education, advantages and marketability of the proposed tool.

Background and Motivation

Education related to computer science and software engineering, specifically in teaching design and modeling is getting more attention in academic community (Agner & Lethbridge, 2017). In teaching object-oriented modeling context, the educators in most universities employ the UML notation to teach their students about modeling. Thus, selecting the UML too to support the teaching and learning of modeling for students is also a hard decision for educators. There are many commercial UML tools to support the teaching of UML. However, these tools are mostly focused for professional developers and not for educational purposes (Ramollari & Dranidis, 2007).

There have been several research attempts to develop automated tools to support the educational UML tools. Table 1 lists several researches in educational UML tools. These tools provide various levels of research contribution to educational UML tool development, such as the target users, focus of the UML diagrams, approach and supporting features used in the educational UML tool. The finding shows that previous studies focus more on the UML Class diagram. The UML class diagram is favored because it is one of the most important diagrams of UML (Erickson & Siau, 2007). Some studies focus on two diagrams such as Class and Sequence diagrams, Use case and class diagrams, and other UML diagrams. Studies that provide an educational UML tool which include all UML diagrams are still lacking. Most of the studies provide the educational features that emphasize on teaching and learning aspects. These aspects include: easy to teach and learn, benefit the educators and students, provide quick comments and feedback, improve students' learning and understanding, and others.

Table 1: Research tools on UML education

Tool Name	Type of UML Diagram	Educational features
StudentUML (Ramollari & Dranidis, 2007)	Class Diagram and Sequence Diagram	Easy to learn and use, support correctness and consistency
SketchUML (Tenbergen et al., 2008)	Class Diagram	Tablet Pc-based e-learning tool, support for sketching a valid UML diagram
UML class diagram tool (Soler et al., 2010)	Class Diagram	Web-based e-learning tool, support for automatic and on-line correction
UMLGrader (Hasker, 2011)	Class Diagram	Grades student's diagram, support for automated grading and feedback
UML-IT (Weerasinghe & Evans 2015)	Class Diagram and Sequence Diagram	Intelligent tutoring system (ITS), support for learning multiple UML diagrams
Class Diagram Critic(CDC)(Abdulkareem et al., 2017)	Class Diagram	Critique student's design, support for error checking and automated feedback

The complexity of learning UML in object-oriented modelling (Erickson & Siau, 2007, Ramollari & Dranidis, 2007, Tanaka et al., 2014, Agner & Lethbridge, 2017) and the importance of modelling education (Akayama et al., 2013, Akayama et al., 2012, Agner & Lethbridge, 2017) is the motivation of this research. Next section explains our UDL approach.

Innovation Approach- UML Diagram Learning Tool

We have developed a prototype of UML Diagram Learning (UDL) tool via automated errors detection features for UML use case and class diagrams. The objective of the UDL tool is to check and detect diagram errors of use case and class diagrams created by users/students. The overview of the UDL development using the automated error detection approach is shown in Figure 1(A). Basically, a student/user will interact with the UDL tool to draw a use case diagram or class diagram based on exercise

given by a lecturer. The UDL tool checks the diagram created by the student and detects possible errors on the diagram. Error detection is performed automatically by the UDL tool and the errors are displayed to the student. The display of diagram errors consists of error description, element name and element type. The error description provides a brief of explanation why the error exists. The element name and element type is to show the diagram element and type that contains the error. Thus, the student has the option to improve the diagram by fixing the errors manually. Finally, an improved diagram with no error is saved in the UDL tool. The interface of the UDL is shown in Figure 1 (B) with example of use case diagram errors.

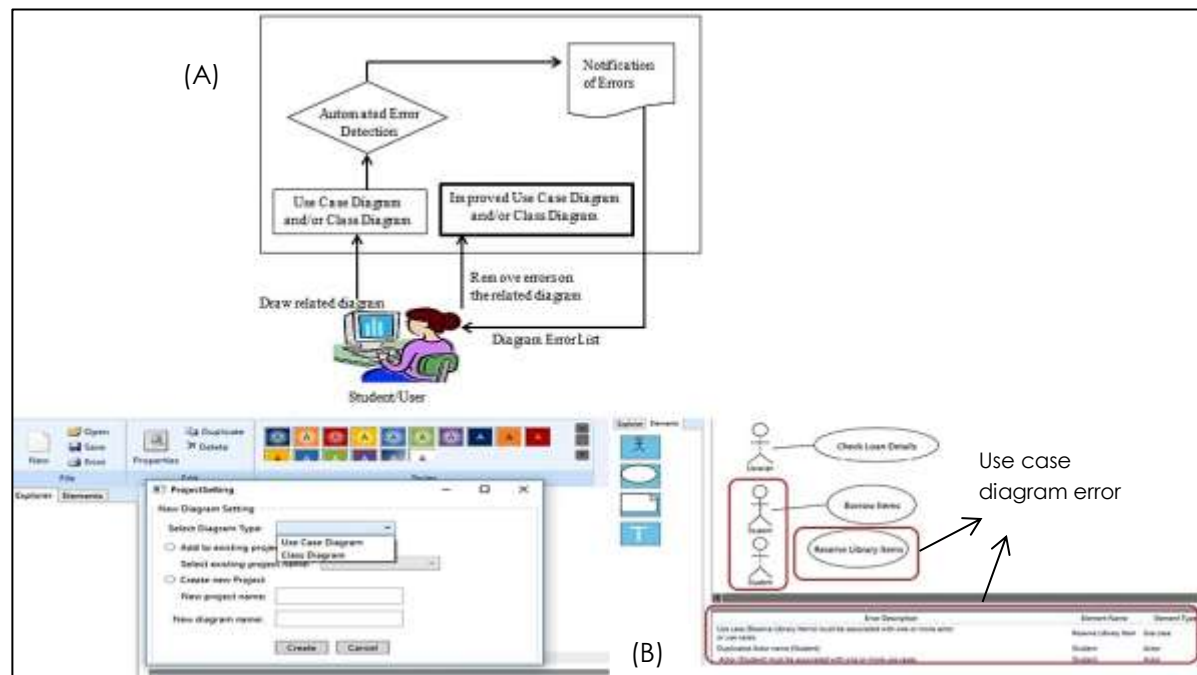


Figure 5: Overview of UDL tool (A) and Interface of UDL with an example of Use case diagram error (B)

The Importance of UML Diagram Learning (UDL) tool to Education

Modeling is a main activity in software engineering and tools for supporting modeling in education are very important (as cited in Agner & Lethbridge, 2017). Thus, educators need to have the skill and knowledge in modeling in order to teach and equip students with effective modeling skills. The students need to be trained well in modeling so that they can apply their modeling skills and knowledge in industry. The main objective of this research is to provide an educational supporting tool that can facilitate the students in the learning of UML modeling, specifically UML diagrams. Thus, the importance of our UML Diagram Learning (UDL) tool for higher education is as follows:

- Ease of teaching and learning about UML modeling;
- Provide immediate feedback to students;
- Ease the educators' workload in evaluating UML models;
- Provide continuous self-learning to students via the educational supporting tool
- Enhance the teaching and learning process of UML modeling
- Equip the educators and students with useful UML modeling capabilities
- Contributes to building lifelong learning and other 21st Century skills on undergraduate and post-graduate education.

Advantages and Marketability

The work is about software modeling and educational supporting tool. The software modeling area has important educational and software industry benefits. The market for software modeling tools and educational UML tools is also demanding and increasing. The advantages of our UML Diagram Learning tool towards education and academic community are as below:

- Facilitates the teaching and learning of UML modelling via educational UML tool.
- Provides the automated error detection features that could support the students' in modeling a correct UML diagrams.
- Students can produce an improved and correct UML diagrams due to the automated error detection features.
- Ease the educators' workload in providing feedback on the students' design/model.
- Improves the learning and understanding of students about UML modelling via a simple educational UML tool.
- Modeling education can be enhanced through the use of effective and efficient educational UML tools.

The potential markets for UML Diagram Learning tool are multiple. The potential markets include Computer Science and Software Engineering educators, Computer Science and Software Engineering students, Public and Private Higher Education Institutions, Government agencies and Software Companies.

Conclusion

We have described our educational UML tool, i.e. a UML Diagram Learning tool to support computer science and software engineering students in learning object-oriented modeling. We have briefly presented several UML educational tools in modeling education. We also briefly explained the overview of UML Diagram Learning tool approach. This research work is very much proof-of-concept that an educational UML tool using automated error detection approach will support the students to improve their knowledge and skills in UML modeling. Our plans for future work on this research include the error detection of other types of UML diagrams and perform effectiveness evaluation of the UML Diagram Learning tool via end user evaluation.

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ID NO. UPM009**TOPIC: Designing UML Diagram using Tablet/Smartphone
on Android Platform****Osama Barayan and Norhayati Mohd Ali**

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Abstract: Unified Modeling Language (UML) diagrams play an important role in the software development activities. The use of UML diagrams will support the software teams to communicate and understand better the construction of a software system. There are many UML supporting tools to facilitate software developers in their software development activities. However, these supporting tools are for desktop-based and web-based applications. The design of UML diagrams in an easy and quick way on tablet applications is still lacking. Portable devices such as tablets and mobile applications become an alternative to desktop or personal computers. Most of the portable devices run on Android operating system. The mobile application development industry is increasing and growing up due to the extensive use of applications in mobile devices. Thus, we propose a portable UML diagram tool using a tablet or smartphone on an Android platform. The idea of this project is to provide an application that supports the software engineering students and novice developers/designers in software modeling and design activities using a portable UML diagram tool which runs on the Android platform. A portable UML diagramming tool on a tablet or smartphone would be very useful because it helps the software engineering students especially in software modeling and design exercises. It also benefits the software developers and their stakeholders to communicate and design quickly the diagrams in a simple way.

Key words: UML diagrams, UML tool, Android platform, Mobile application, Software modeling.

Introduction

Modeling is an important skill in software development (Börstler et al., 2012). The software development activities produce several software modeling artifacts. Thus, an essential and required skill expected from a software engineer is the ability to model software systems using multiple diagrams (Weerasinghe & Evans, 2015). One of the modeling languages that are widely used in software engineering is the Unified Modeling Language (UML). UML is a widely used standard modeling language that provides a way to visualize the design of a system. Due to the increasing of mobile applications development, the UML modeling is also been developed in mobile devices like pads, touch screens, smartphones and tablets (Benouda et al., 2016, Ma et al., 2014). These devices are alternatives to personal computers (PCs) with different Operating Systems (OS). The OS can be in a platform of Android, iOS, Black Berry, Windows Phone and others. However, modeling tools that employ this kind of technologies are still few and challenging. Thus, we aim to propose a portable UML diagram tool using a tablet and smartphone on an Android platform. The idea of this project is to provide an application that supports the software engineers and software engineering students in modeling and design activities using a mobile UML diagram tool which runs on the Android platform.

Background and Motivation

UML diagrams are one of the modeling languages used by software developers for designing software in software engineering. Software developers usually create UML models with modeling tools such as Visual Studio running on PCs, and this type of tools mainly use mouse input and keyboard input. There are different approaches that can be employed to design a software design without using computer, such as whiteboards (Magin & Kopf, 2013). According to (Magin & Kopf, 2013), whiteboards let several users to work on the design at the same time and this support for instant discussion on the design results and collaborative design. With the current technologies, tablets and smartphones are alternative to whiteboards that can support collaboration design activities. However, several studies reported that designing UML diagrams via collaborative multi-touch design tools and mobile devices are still lacking (Magin and Kopf, 2013, Ma et al., 2014). A number of UML tools are supported by tablet and mobile

platforms. For instance, Tenbergen et al., (2008) describe the development of SkeethUML which was designed for Tablet PCs, and receives input via the Tablet PC's pen or stylus. A visual feedback is presented to the users when an invalid UML syntax component is detected. The SketchUML is basically a pen-based user interface. Likewise, Magin and Kopf (2013) have developed a complete multi-touch UML design tool that allows collaborative work on UML diagrams. The users of multi-touch UML design tool are from professional software developers and students who use the tool for collaborative learning (Magin and Kopf, 2013). Similarly, Matsui and Matsuura (2014) described their work on UML-based model driven development (MDD) method using *Smartphone Feature Specific Model with GUI builder* independent of any specific OSs. They explain how to model and develop smartphone applications efficiently. This helps other researchers that have invested much effort in developing smartphone and tablet applications. The increase use of touch screens, tablets and smart mobiles, and the need to assist users to model a software system in a quick manner via smartphone and/or tablet features are the motivation of this work. The following section explains briefly our UCCD tool.

Innovation Approach- Use Case and Class Diagram via Smartphone/Tablet.

We have developed a prototype of **Use Case and Class Diagram (UCCD)** tool that runs on Android platform via smartphone or tablet device. The objective of the UCCD tool is to allow users to be able to draw use case diagram and class diagram in a simple way using smartphone or tablet device. The overview of the UCCD architecture is shown in Figure 1 (A) and a snapshot of the UCCD interface for use case diagram is shown in Figure 1 (B).

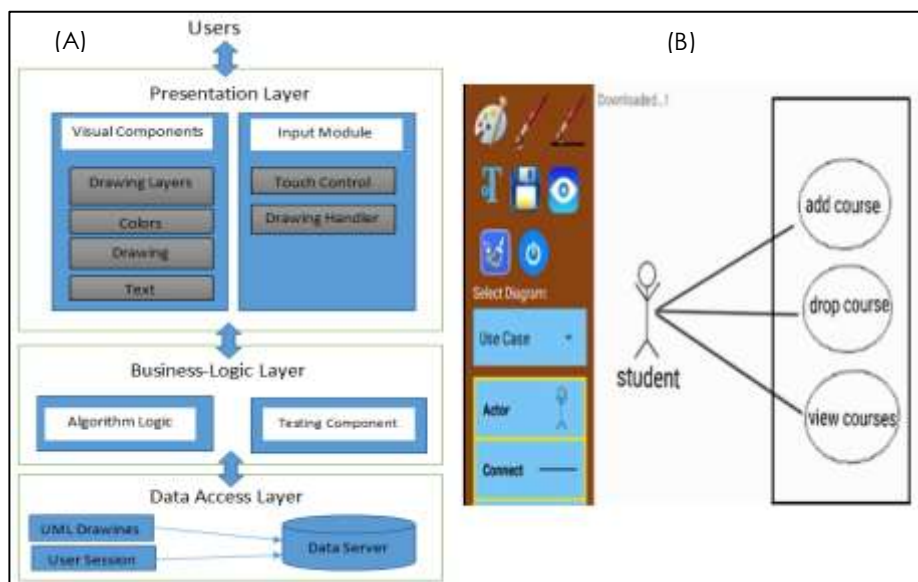


Figure 6. Architecture of UCCD (A) and a snapshot of UCCD interface (B)

The architecture of UCCD application consists of Presentation layer, Business-Logic layer and Data access layer. The first layer is a Presentation Layer that represents the User Interface (UI) component. It consists of two interconnected modules: Input module and Visual component. The Input module is responsible for user touch input and drawing recognizer to process the user input and display the output. All graphical representations are presented in this layer. A touch control receives input coordinates and this can be from different touches input. A drawing handler identifies the informal drawing symbols and transforms it to the formal drawing. The Visual component consists of drawing layer, which includes visual display of main screen, visual representation of brush types and drawing, diagram elements, diagram types, text and colors. User mainly interacts with the presentation layer. The next layer is the Business-Logic Layer. The actual logic implementation of the application is performed here. Algorithms used behind the application are present in this layer. It shows implementation for adding image, saving image, clear screen, add element, delete element, and the process for combining the whole elements into a single sketch. Finally, the third layer is the Data Access Layer. In this layer, data storage is used to store drawings and user information, which helps to maintain user viewing sessions and drawings. All the data being used, is stored, accessed and maintained in this layer.

The Importance of UCCD tool via smartphone and tablet to Education

Modeling is a main activity in software engineering. Hence, tools for supporting software modeling in education are very important (Agner & Lethbridge, 2017). The application of mobile devices such as smartphones and tablets offers a promising educational technology. The main objective of this work is to provide a mobile supporting tool that can facilitate the users in the learning of UML modeling using smartphone or tablets. Thus, the importance of our smartphone and tablet application of UCCD for higher education is as follows:

- Supports software modelling and design in education by providing an efficient modeling and design tools via smartphone and tablet applications;
- Provides and develops alternative approach that make software modelling teaching more attractive to students;
- Enhances and facilitates collaboration among educators and students in software modelling and design activities via the mobile applications.
- The use of smart mobile devices such as smartphones and tablets will enhance and improve the Software Engineering Education.

Advantages and Marketability

The work is for software engineering practitioners in both software industry and academia. The software modeling area has important educational and software industry benefits. The market for software modeling tools and educational UML tools is also demanding and increasing. The advantages of our UCCD via smart mobiles towards education and software engineering community are as follows:

- Supports for the interactivity of UML design for multi users via multiple sharing session;
- Provides an alternative device to personal computers to perform the UML design in a simple way;
- Enhances the communication and collaboration among software engineers in software development activities;
- Software development process and modelling education can be improved through the use of effective and smart mobile applications.

The potential markets for UCCD tool via smartphones and tablets are multiple. The potential markets include Computer Science and Software Engineering educators, Computer Science and Software Engineering students, Public and Private Higher Education Institutions, Government agencies and Software Companies.

Conclusion

We have described our UCCD tool for smartphone and tablet that facilitate the software engineers and students in modelling and design task. We have briefly presented several UML applications that use touch screen, tablet and smartphone technologies. We also briefly explained the architecture of UCCD tool. This research work is very much proof-of-concept that development of UML application for smartphones and tablets can support for easy drawing of UML diagrams. It also enhances the modelling and design of software projects which is usually performed in teams.

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ID NO. UPM 010
**TOPIC: Examination Management System based on
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Content

1. Description of your innovation / product development / design / process.

The Examination Management System is the Web-based platform system that will assist the lecturers in creating and generating examination paper based on the cognitive domain that comply with MQA requirement which are knowledge (C1), comprehension (C2), application (C3), analysis (C4), synthesis (C5) and evaluation (C6). The system consists of three users (head of department, supporting staff and academic staff). Each of these users has their own role in the system, for the head of department, he/she will be responsible in adding the new supporting staff and endorsed the assessment plan created by the supporting staff. Supporting staff will be the one that adding the academic staff (lecturers), subjects and assessment plan of the subject. Academic staff is the lecturers that also can be a moderator in assessing and endorsed the examination paper. The lecturers construct the examination paper and wait for the moderator that has been assigned to them to approve the examination paper. All of the examination papers will be stored in the question bank that later can be viewed by all the lecturers registered in the system.

2. What is the context or background of the innovation / product development / design / process?

The context or background of the innovation is based on the education and examination process in university level and it can become a tool that will bring benefits to the education field in assessing fairness in the examination process.

3. Why are they important to education?

This system is important in education as it highlights fairness in assessing individuals and standardize the level of the question for every student's studies in the universities. It is a mechanism that helps the lecturer to analyze the ability of each student in a standard level of the university.

4. Please write any advantages of your innovation / product development / design / process towards education and community.

The advantages of this innovation are their fairness in assessment, then standardizes the level of cognitive to be assessed and paperless. The fairness shows that the student being evaluated with the appropriate method in universities level. This system avoids students to choose the lecturer that can easily give them a full mark without an appropriate method. In terms of standardization, this system provides lecturer the easier method to aware with the problematic students because of the way of standard assessment. The system is more paperless because every set of question we required a moderator to evaluate, then with this system, the lecturer does not require to print and directly send the question to the moderator to be evaluated and approved.

5. Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

This system is the computerized version of the current examination management system so the benefit and commercial value from it are it will be paperless and bring convenience to the environment. This system can provide benefits in terms of facilitation to lecturer in providing quality questions and meet specified standards from management to evaluate students at institutions.



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ID NO. UPM 011
TOPIC: Prototype to Classify Questions and Alignment to Learning Outcome in OBE

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Abstract: In outcome based learning, learning outcomes to be achieved by students are important in the learning process. It is used to express what students are expected to achieve and how they are expected to demonstrate the achievement. The learning assessment must be aligned with the learning outcomes in order to evaluate student learning achievement. The learning assessment specifies which assessment resources and methods are to be used to assess the achievement of intended learning outcomes. Question is an element of assessment and it should be classified and categorized into correct level of corresponding taxonomy. However, poorly designed assessments usually may lead to the failure in examining the achievement of intended learning outcomes of a course and lead to unsatisfactory achievement of learning outcomes. This is mainly due to lack of tools available in evaluating the level of assessment in question paper as well some instructors may not be aware with the learning taxonomies that suit in their disciplines. Moreover, it is a time consuming process to evaluate the level of the questions manually. Therefore, the focus of this study is to propose a conceptual model in classifying the question by using classification technique and aligning the question to learning outcomes according to Bloom's taxonomy in order to reduce the amount of time constructing and preparing the question paper. A prototype is developed by applying the question classification technique and mapping technique that will automatically classify the questions and align the assessment resources to the learning outcomes. Apart of that, the question constructed will be aligned with learning outcomes, thus mapped to the course outcomes. Furthermore, the prototype will assist instructors in constructing exam questions and enhance the quality of questions.

Key words: *Learning Outcome, Learning Assessment, Question Classification, Mapping, Bloom's taxonomy*

INTRODUCTION

In education, outcome based approach has been used to assess the learning outcomes of a course for a number of years internationally. It focuses on what students must be able to demonstrate what they know, value and can do at the end of a course and program. These expectations are expressed as learning outcomes, which underlie programs and courses (Angelo & Cross, 1993). Learning outcomes consist of three main aspects which are knowledge, skills and competence. Learning outcomes articulated purposely to express what students are expected to achieve and how they are expected to demonstrate their achievement. Learning objectives must be clear and concise on describing what students are intended to learn by the end of the course. Therefore, learning outcomes should be visibly articulated in order to evaluate the effectiveness of the teaching and learning process. Sahar Yassine & Sicilia (2016) point out that each of identified learning outcome should be clearly measured and a target benchmark should be clearly identified. Hence, learning outcomes implicate the expectation of what learners will gain as a result of learning, so there should have a clear relationship between learning

outcomes and assessment in order to assess and measure the students to achieve the learning objectives as well the learning outcomes.

METHODOLOGY

In this paper, we propose a conceptual model in classifying the question by using classification technique and aligning the question to learning outcomes according to Bloom's taxonomy. At first, we identify component of question classification and alignment to learning outcomes. Then, we propose a conceptual model for classification and alignment of question to learning outcomes. At last, we develop a prototype in order to measure the usability and the correctness of question classification aligned with learning outcomes.

We implement keyword matching for question classification and alignment to the learning outcomes. The prototype is developed to classify the questions and align them to the learning outcomes will help the instructors to deal with current challenges in constructing the questions according to Bloom's taxonomy.

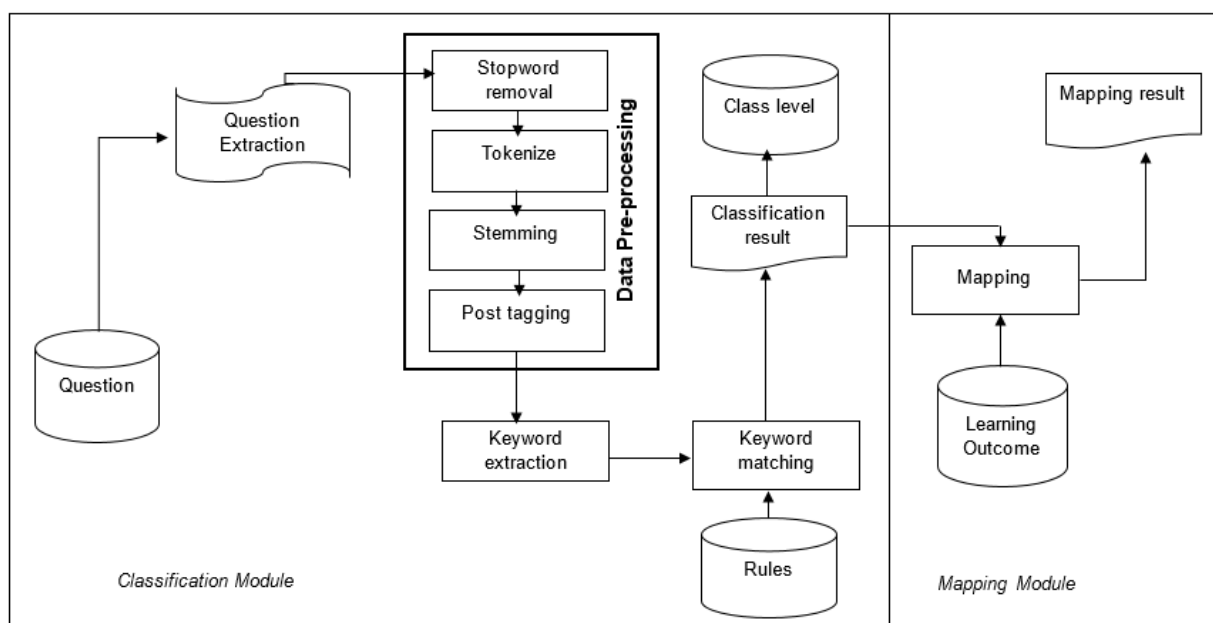


Figure 1: Conceptual model for classification of questions and alignment to learning outcome

FINDINGS

The keyword matching and rule-based approach are adapted as proposed by K. Jayakodi et al. (2016), Kithsiri Jayakodi et al. (2015), Omar & Haris (2012) in classifying the questions into Bloom's taxonomy for cognitive level with the enhancement of the approach by aligning to learning outcomes of a course. As shown in Figure 1, we proposed two modules for the conceptual model which are classification module and mapping module. Classification module is to classify and categorize the question into correct level of Bloom's taxonomy while mapping module is to map and align the questions to learning outcomes of a course.

Then, a total of 20 participants (Jakob, 2014) voluntarily participated in the study. An experiment was conducted using the proposed prototype involved with two type of users where seven of them are course coordinators and thirteen of them are instructors that familiar with the cognitive level of Bloom's taxonomy in order to validate the correctness of questions classification and the alignment of assessment resources with learning objectives of course according to Bloom's taxonomy. They were asked to browse around the system to become familiar with its contents and capabilities. At the end of evaluation, they were asked to complete the questionnaire to express their satisfaction with the usability of the system. Moreover, data sets consists of 80 questions assigned by the respondents during the experiment to evaluate the correctness of the classification and alignment.

Table 1: The correctness of questions assigned by respondents based on class feature

No.	Class feature	Class level	No. of assigned question	No. of correctly classified question	Correctness
1.	Remember	C1	19	18	0.95
2.	Understand	C2	18	18	1.00
3.	Apply	C3	9	7	0.78

4.	Analyze	C4	6	6	1.00
5.	Evaluate	C5	5	4	0.80
6.	Create	C6	3	3	1.00
TOTAL			60	56	0.933

CONCLUSION

As shown in Table 1, most of results were positive where the overall correctness of the classification and alignment of questions to learning outcomes provide high accuracy result with 0.93 that closer to 1. The findings in this study could help the instructors to deal with current challenges in constructing the questions according to Bloom's taxonomy. Hence, the proposed prototype will help them to generate better quality questions as well as reducing the amount of time and effort in preparing the questions paper.

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ID NO. UPM013

TOPIC: DISLEKSIABELAJAR: MOBILE APP FOR DYSLLEXIC CHILDREN TO LEARN THE MALAY LANGUAGE

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Abstract: Children with dyslexia are found to have significant difficulty in language processing skills that affects reading, writing, speaking and listening. They have problems processing the information they see when looking at a word. Thus, teaching dyslexic children is said to be a very complex, challenging and demanding task. These children require learning styles that promote visual, auditory and kinesthetic sensory. In addition, students in the rural and remote regions are also reported to have limited access to educational resources. It is suggested for dyslexic learners to use mobile phones to make learning an easier process and accessible. The mobile apps encourage children with dyslexia to carry out more exercises. As for the children's interaction and learning through technology, it can steadily improve their mind mapping abilities. Therefore, the objective of this work is to develop a mobile application for dyslexic children to learn the Malay language. The mobile app called DisleksiaBelajar targeted for children aged 7 to 12 years old. The Malay language is one of the core subjects in the Malaysia primary education syllabus it is fundamental for every primary student including dyslexic children to get a good grasp of the language. The work is carried out using user-centred design approach that involves higher participation from the users i.e. student, teacher and parent. DisleksiaBelajar user interface is designed to be dyslexia friendly and adopted the multimodal approach i.e. text, audio, image. Finally, usability testing and expert reviews were conducted to evaluate the DisleksiaBelajar. The early results have shown a promising feedback and improvement in children learning's experience.

Key words: *Dyslexia, Mobile application, Children, Malay language*

Introduction

According to the Dyslexia International Association (IDA), dyslexia occurs in at least one in 10 people, putting more than 700 million children and adults worldwide at risk of life-long illiteracy and social exclusion (IDA, 2015). Children with dyslexia are found to have significant difficulty in language processing skills that affects reading, writing, speaking and listening. They have problems processing the information they see when looking at a word (Subramaniam, 2008). Often, they will have trouble linking the sound made by specific letters or deciphering the sounds of all the letters together to form a word. Thus, teaching dyslexic children is said to be a very complex, challenging and demanding task (Ndombo et al, 2013). These children require learning styles that promote visual, auditory and kinesthetic sensory. In addition, students in the rural and remote regions are also reported to have limited access to educational resources. It is suggested for dyslexic learners to use mobile phones to make learning an easier process and accessible (Skiada et al, 2013). In other words, mobile apps encourage children with dyslexia to carry out more exercises. As for the children's interaction and learning through technology, it can steadily improve their mind mapping abilities.

Therefore, the objective of this work is to develop a mobile application for dyslexic children to learn the Malay language. The mobile app called DisleksiaBelajar targeted for children aged 7 to 12 years old. The Malay language is one of the core subjects in the Malaysia primary education syllabus it is fundamental

for every primary student including dyslexic children to get a good grasp of the language. The work is carried out using user-centered design approach that involves higher participation from the users. Thus, a series of observations, interviews and class activities with the Persatuan Dyslexia Malaysia (PDM) teachers, parents and children were conducted. Finally, an evaluation conducted involves two main phases: the pilot study and subsequently the usability testing with dyslexic students and the review with experts.

The extended abstract is organised as follows: the second section presents the background study, the third section discusses the research method, the fourth section discusses the solution DisleksiaBelajar and finally, the last chapter provides the concluding remarks.

Background

In Malaysia, the Department of Social Welfare (DSW) has reported in 2013 from 494,074 people with disabilities and among them 178,800 was diagnosed with dyslexia or Specific Learning Difficulties (SpLDs) (DSW, 2013). While in 2014, the Malaysia Ministry of Education (MoE) has reported a total of 28,139 students have registered under Special Education School which support students with learning difficulties (MOE, 2015). It is believed the statistic is actually higher than recorded because in Malaysia people with dyslexia or SpLDs are registered based on a voluntary basis. Based on MoE statistics in 2014, the number of primary school teachers specialises in special education is still low as compared to the enrolment of the students (MOE, 2015).

In order to address the dyslexia learning difficulties several computer-based learning models have been introduced (Abdullah et al., 2009; Ahmad et al. 2013; Daud & Abas, 2013; Ndombo et al, 2013; Rello et al., 2014). Learning through the computer is capable to facilitate the learning process for students with dyslexia that shows >60% improvement in reading, writing and phonological awareness (Ndombo et al., 2013). The computer-based learning model is also found to be more interesting, user-friendly, attractive and supportive (Rello et al., 2014). In Malaysia, currently there are limited studies conducted to support students with dyslexia to learn the Malay language. The first work is MyLexics CD courseware developed by [Abdullah et al., 2009]] helps children in reading and writing using dual coding theory and scaffolding teaching strategies, which enhanced word or letter recognition through the visual and verbal format. The second work by [Ahmad et al., 2013] is using a CD courseware 'Bijak Membaca' for dyslexia students in primary school has combined several phonic reading techniques include letters, syllable, word and sentence using a multisensory approach. The final work is 'Dyslexia Baca' mobile app developed by Daud & Abas (2013) is also used the multisensory approach in teaching special orthographic such as distinctions of 'b','d', 'p','q', and 'm','n'.

Mobile learning (m-learning) environments provide a wide range of new and exciting learning opportunities supported by the wireless technology. Tamhane et al. (2015) state m-learning is the use of mobile technology, either alone or in combination with other ICTs enables learning to be done at any time and anywhere. Skiada et al. (2013) have also emphasized that m-learning can motivate the children or students, as it can potentially accommodate a wide range of features and sections which offer a highly interactive learning experience. M-learning can particularly enable repetition of facts, instant feedback and evaluation, and can actively engage learners as it emphasizes learner-centeredness (Muyinda et al., 2007). Thus, over the years m-learning has become very prevalent in teaching and learning process in order to enhance the learning and education experience of the students.

Based on the potential benefits discussed in supporting dyslexic children in using computer-based learning models and adopting the mobile environment further investigation is required to develop a suitable mobile app solution for dyslexic children to learn the Malay language. The main concerns to design and develop a mobile app that has dyslexia friendly user interface, suitable learning contents and supports different learning styles.

The Method

The work is carried out using user-centred design approach that involves higher participation from the users i.e. student, teacher and parent. It involves four main phases: reviews from literature and secondary data analysis, design prototype, develop the mobile app and evaluation. The first phase involves two main activities, first conducting literature reviews to analyse existing related works and second conducting secondary data analysis from the study conducted by A. Hamid et al. (2017). In A. Hamid et al. (2017) work a series of observations, interviews and class activities with the Persatuan Dyslexia Malaysia (PDM) teachers, parents and children were carried out. The outcomes of analysing secondary data are to create the realistic user personas i.e. student, teacher and parent. The user persona is crucial to understand the users' needs, experiences, behaviours and goals.

The second phase is to design the low and medium fidelity prototype using sketches and wireframing. The prototype is adopting design guidelines that adhere to dyslexia needs and learning contents that align with LINUS Ministry of Education. The third phase is to develop the mobile app solution called DisleksiaBelajar by using Unity3D on Android Platform. Unity is a cross-platform game engine and adopted the Model-View-ViewModel (MVVM) pattern. Finally, the fourth phase is to conduct the evaluation in two main sub-phases. The first a pilot study involves 5 children aged 6 until 12 years old to demonstrate that the evaluation protocol is feasible. Then afterwards a usability testing and expert review sessions are conducted. The usability testing involves 15 dyslexic children aged 7 until 11 and using FunKit techniques i.e. Smileyometer and Again-Again Table as well as Software Usability Scale (SUS). While expert sessions involve two teachers that have 5-30 years teaching experience with dyslexic children.

The DisleksiaBelajar Mobile App

The DisleksiaBelajar mobile app has four main learning modules phonology, spelling, reading dan writing. Each module consists of several levels. Some examples of exercises are summarised in Figure 1 and some screenshots of the app are shown in Figure 2.

A. PHONOLOGY (Recognition of letters)	B. SPELLING	C. READING	D. WRITING
- Alphabet <i>Huruf</i> - Vowel (Matching) <i>Bunyi Vokal</i> - Vowel (a, e, i, o, u) - Consonant <i>Bunyi Konsonan</i> - Syllable <i>Suku Kata</i>	- Easiest (3 letters, 2 syllables. Eg: <i>a pi</i>) - Easy (4 letters, 2 syllables. Eg: <i>ku ku</i>) - Moderate (6 letters, 3 syllables. Eg: <i>ke re ta</i>) - Moderate Hard (Rearrange the letter with the picture shown) - Digraph (ny, ng, kh, sy) - Diftong (ai, au, oi)	- Vocabulary <i>Perbendaharaan Kata</i> - Comprehension <i>Pemahaman</i> - Reading paragraphs	- Flashing card within 6 seconds, then spell out - Show sentence and copy - Name of the parents - Build sentence with simple words given

*Common letter problems: e, t, v, z, x, j, k, w, g, y

Figure 1. Example of learning contents based on modules



Figure 2. Modules main screen, vocal exercise and reading exercise screenshots (from left to right)

Conclusion

In this work, we have shown the importance of computer-based on platform intervention to support children with dyslexia with language-based processing skills e.g. spelling, reading and writing. The first version on DisleksiaBelajar has shown very promising results to help dyslexic children to learn the Malay language in more interactive, accessible and fun way.

Acknowledgement

We are grateful for the Ministry of Higher Education & Universiti Putra Malaysia via FRGS grant (Vot. No.5524832) for support of this project. In addition, we thanked the university's ethics committee JKEUPM who has approved our application to conduct this study.

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ID NO. UPM014
TOPIC: COMPONENT REGISTRY AND DISCOVERY (CORED): AN EDUCATIONAL REUSABLE COMPONENTS REPOSITORY FOR SOFTWARE ENGINEERING BACHELOR STUDENTS
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Abstract: Component Registry and Discovery (CoRED) is a cloud-based software component repository that promotes crowdsourced learning approach to enhance software engineering lectures and students teaching and learning experience in the component-based software engineering (CBSE) courses. In CBSE, throughout many semesters, components constructed by students in the course can be reused by other students as practical learning materials or perhaps reused for other software applications. Nevertheless, the growing number of these prefabricated components has made it difficult to be managed and used by the students. In learning the components to be reused is a challenging process itself because the student could also reuse the component that has been developed by the third party or other students. Therefore, in order to manage these components and, allow it to be shared and learned, a repository is required to store (register) these components systematically and eventually to retrieve (discovery) the component to be reused. CoRED has also supported component discovery by providing a reliable search engine. Thus, the Cosine Similarity function an efficient statistical algorithm has been implemented to find the most suitable component according to specified requirements. CoRED is aiming to provide an interactive way while reusing the components and facilitates collaboration between the students.

Key words: Cloud repository, crowdsourced learning, software engineering, software components

Introduction

In software engineering, it is recognised to achieve better software, more quickly and at lower cost, software engineers often rely on systematic software reuse (Sommerville, 2015). One of the main approaches is Component-based Software Engineering (CBSE). In CBSE, software systems are developed by integrating prefabricated software components that conform to component-model standards e.g. J2EE, Microsoft .Net etc (Ahuja, 2014). The benefits of the prefabricated software components are to increased dependability, promotes effective use of software engineers' efforts and reduced process risk (Vale et al., 2014). Thus, CBSE has been an important approach taught in the Software Engineering or Computer Science undergraduate program. In CBSE course students learn how to construct software components and to reuse the prefabricated components to build software applications. Novice software engineers like the students require a simple and accessible platform with more proper assistance and contents for them to carry out the CBSE register and discovery processes.

Nevertheless, it is always a challenging process when reusing the software components especially when the component is developed by other people e.g. the third party or other students. The students are facing problems to find, understand, and adapt software components. Currently, there is no available platform that allows students to develop and reuse software component for learning purpose. The existing cloud repositories such as ComponentSource (ComponentSource, 2018) and AmazonWS (AmazonWS, 2018) is either requires the students to pay for fees for usage or license, and to deal with many complicated features. It is also difficult to manage the increasing number of software components developed by the students. Finally, without having a central repository will limit the accessibility of

prefabricated software components developed among the students. Therefore, the objective of this work is to develop a cloud-based and crowdsourced repository that aims to store (registry) and retrieve (discovery) of software components for CBSE course. The repository could act as an educational tool to manage the prefabricated software components and support the students' practical learning process.

The extended abstract is organised as follows: the second section presents the background study, the third section discusses the research method, the fourth section discusses the solution and finally, the last chapter provides the concluding remarks.

Background

CBSE is a main academic course in software engineering bachelor program of the Faculty of Computer Science & Information System (CSiIT), UPM. The course covers the concept of software component reusability and introduces component technologies such as program libraries, software modules and web services. In the CBSE course, students are required to design and develop software components or acquire the prefabricated components from the third party. Then the students are also required to reuse these components to develop software applications. Throughout several years the CBSE course being conducted, the students have developed many reusable and good qualities software components. These prefabricated components are usually just stored in an individual lecturer or student computers as well as CDs. Often the students are not able to receive feedback about the components that they developed with other people besides their lecturer. This situation bounds them with limitations to improve their works or actively participate to give feedback to another students' work. Nevertheless, in actual CBSE or software reuse practices software components dependability are improved from various feedback received when the component being reused many times.

Crowdsourcing learning is a situation in which two or more people attempt to learn something or gain a better understanding of a specific subject by solving a problem or sets of problems together (Luther et al., 2014; Hu & Johnston, 2012). Crowdsourced learning is based on the idea that knowledge can be created within a group whose members actively interact by sharing experiences and take on asymmetric roles. In practical terms, a model emphasizing crowdsourced learning for a team requires a technological platform in which cooperative efforts can be carried out (Nash, 2005). This platform must include supporting tools for example to support conversations and discussions like hangouts, online forums, chat rooms, etc., as well as tools for software production and quality control (shared IDE's, version control systems, continuous integration and deployment tools, etc.) (Alanazi & Abbod, 2014).

In software engineering, crowdsourcing is also a common approach taken when developing software system e.g. software services and components (LaToza & van der Hoek, 2016). The crowdsourcing approach would be beneficial in learning because it could promote active students' participation, student-student and student-teacher collaborations, and practical approach. Thus, for the students to adapt the crowdsourcing which is a collaborative interaction in nature, the process must be supported with the right technology that encourages crowdsourced learning. Hence further investigation is required to design and develop a suitable educational tool for the students in the CBSE course.

The Method

The work has four main phases: literature reviews, design prototype, develop repository and evaluation.

The first phase involves a study of existing related works, interviews with the lecturers and students who have involved in the CBSE and finally analysing the properties and specification of software components. In the second phase, design covers the system architecture, database structure and prototype using sketches and wireframing. The third phase, the system repository is developed using several technologies

including bootstrap for the user interface, Spring Tool Suite Eclipse-based, JointJS library for data visualization, JDOM and SAX for parsing XML specification, MySQL database, Apache Tomcat app server to host the repository application server.

Finally, in the final phase, usability testing is conducted that involves two main sub-phases. First, a pilot study that involves 10 software engineering students to see whether the evaluation protocol is feasible. Second, the usability testing is conducted that involves 40 software engineering students. All of the students are in their third year of study. The usability testing is using Software Usability Scale (SUS) a reliable tool to measures usability (Lewis & Sauro, 2018). Figure 1 shows the CoRED architecture design.

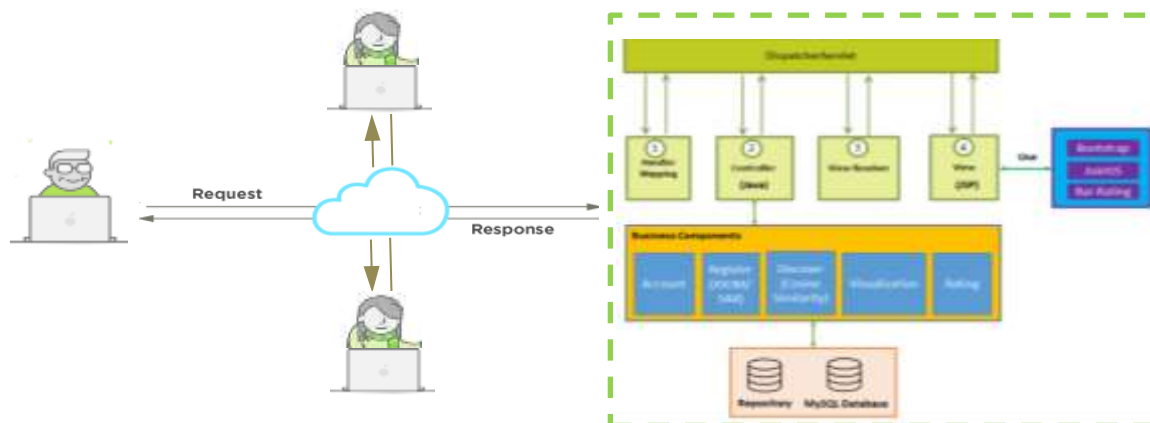


Figure 1. The CoRED architecture

The Component Register and Discovery

Component Registry and Discovery (CoRED) is a cloud-based and crowdsourced repository that aims to provide store (registry) and retrieve (discovery) of software components for CBSE lecturers and students. CoRED has two main purposes that are to manage the prefabricated software components systematically and to support the student's learning. The platform allows the lectures and students to store and retrieve the software components, as well as to promotes active collaboration and feedback among students when practical reuse of these components.

In order to provide the platform CoRED has four main modules: (1) component registration and component management, (2) component discovery and retrieval, (3) component design visualization, and (4) component feedback and rating. Figure 2 shows the CoRED component catalogue and an example of a component design visualisation.

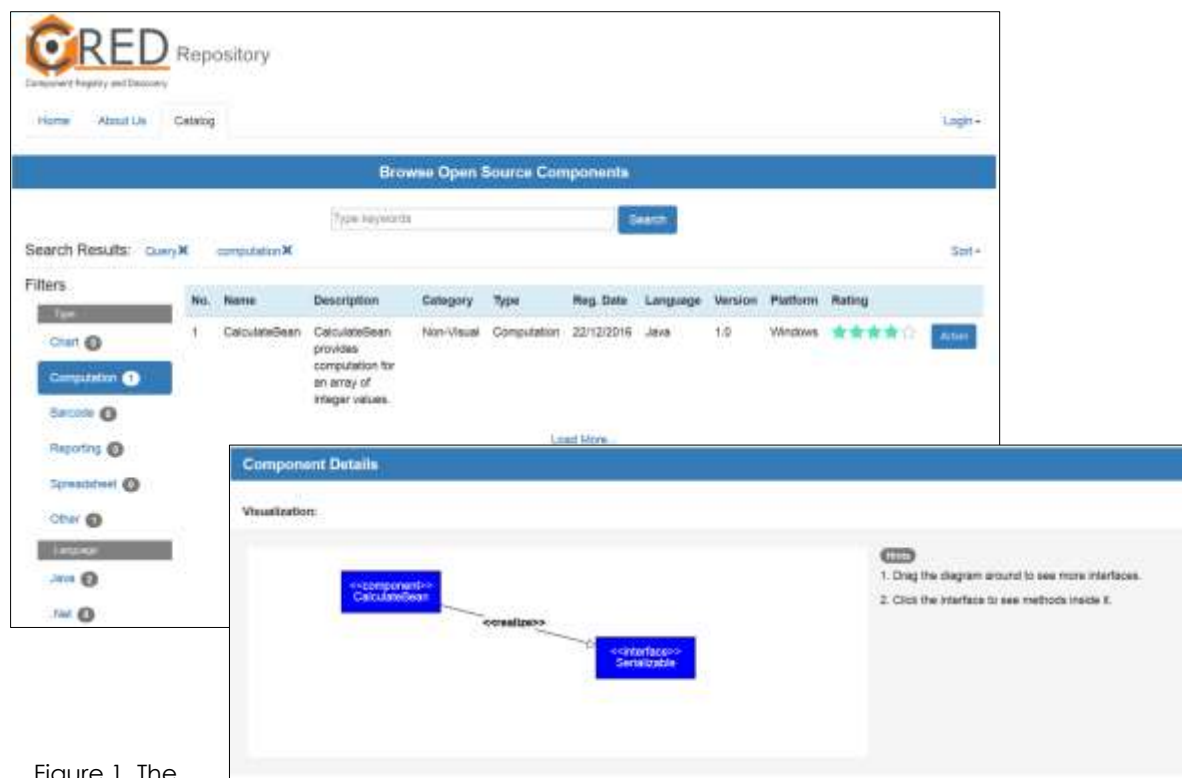


Figure 1. The

CoRED screenshots

Conclusion

In this work, we have explored the benefits of cloud technology and crowdsourced approach to support the teaching and learning in the CBSE course. CoRED is developed based on this technology and approach that offers attractive features compare to existing related systems. CoRED not only acts as a component repository but a platform to promotes learning environment through knowledge (software components' codes) can be created within a group whose members actively interact by sharing feedback and improvement to the components' code. The evaluation conducted among the software engineering students and lecturer in CBSE course has shown encouraging results.

Acknowledgement

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ID NO. UPM015
TOPIC: APLIKASI PENILAIAN ALTERNATIF e-PORTFOLIO DIGITAL (APePD)
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Abstrak

E-Portfolio secara ringkasnya merupakan satu kompilasi sistematik yang mengandungi bahan-bahan pembelajaran yang dihasilkan serta pengalaman pembelajaran atau pencapaian. Kompilasi ini dihasilkan dalam bentuk simpanan dalam talian. E-Portfolio merupakan nadi utama yang menjadi bukti pembelajaran serta pencapaian kemahiran pensyarah tentang aktiviti-aktiviti yang dijalankan bersama pelajar sama ada dalam bentuk muat naik nota-nota pengajaran, bukti-bukti aktiviti pelajar dan penilaian atau pentaksiran pelajar. Selain untuk pemarkahan, E-Portfolio sebenarnya memberi kelebihan kepada pensyarah dan pelajar bila mana pensyarah ingin menilai prestasi tugas pelajar secara langsung dapat melihat bukti-bukti tugas pelajar dalam E-Portfolio ini dengan mudah dan afektif. Sifat E-Portfolio yang autentik serta membekalkan maklumat bukan statik akan memberi gambaran lebih jelas tentang kapasiti dan kemahiran pensyarah. Jadi, penghasilan E-Portfolio haruslah didasari oleh semangat dan daya juang pensyarah sendiri, dan tidak seharusnya digerakkan oleh faktor pemarkahan pensyarah itu semata-mata tetapi sebagai platform tugas dan aktiviti pelajar untuk diberikan penilaian yang saksama, mesra pengguna dan telus. Metodologi yang dipraktikkan antara lain menggunakan kaedah 1+2+3, THINK PAIR & SHARE, Tugas Kumpulan, Social Experiment, Pemerhatian, Kajian Lapangan, Role Play, 1st Year Seminar/Experience (FYS), Service/Community Based Learning (SBL), Intensive Academic Writing (IAW), Diversity / Global Learning (DGL), Collaborative Assignment And Project (CAS), dan Interdisciplinary Approach To Assessment (ID). Objektif penting daripada pelaksanaan E-Portfolio ini adalah untuk a) melihat faedah E-Portfolio sebagai alat penilaian, b) melihat cabaran E-Portfolio sebagai alat penilaian dan c) mengenalpasti E-Portfolio sebagai amalan terbaik pentaksiran alternatif pengajaran dan pembelajaran dan penilaian pelajar (alternative assessment). Berdasarkan respons yang dianalisis, respons dapat dikategorikan kepada tiga, iaitu: i) merendahkan artikulasi idea, ii) membolehkan kreativiti dan iii) membolehkan refleksi yang lebih mendalam. Maklum balas yang diberikan oleh pelajar secara umumnya boleh dikelompokkan dalam tiga kategori, iaitu i) penilaian adil, ii) masa terhad dan iii) membantu memberi kefahaman tambahan terhadap tajuk-tajuk dalam rangka kursus pengajaran dan memenuhi objektif pembelajaran pelajar (LO)

Keywords: Amalan Terbaik, Pentaksiran, E-Portfolio Alternatif, Pengajaran, Pembelajaran

Pengenalan

Pendidikan Abad 21 (PA21) dalam kepelbagaian budaya merupakan satu strategi dan perspektif baharu untuk memahami variasi pelajar daripada masyarakat berbilang kaum dan budaya. Kaedah penilaian alternatif dan aktiviti yang dijalankan ini dapat membentuk hubungan yang lebih harmoni semasa interaksi berlaku. Strategi ini dapat membantu para pelajar untuk memahami kepelbagaian budaya yang ada di negara ini supaya matlamat pendidikan untuk memberi kesedaran kepada pelajar tentang wujudnya pelbagai nilai, budaya, agama dan bangsa dalam masyarakat serta terdapat pula persamaan-persamaan dalam budaya berbagai dapat dicapai. Cabaran-cabaran dalam mendidik generasi abad 21 yang digalas oleh pensyarah yang berada di IPT Malaysia adalah untuk membentuk masyarakat majmuk yang menjadi landasan kepada UNESCO untuk mengembangkan teras-teras dalam pendidikan yang asas, iaitu, teras yang keempat: learning to live together. Ini bermakna, PA21 seharusnya mampu mewujudkan suasana supaya pelajar merasakan mereka mampu untuk hidup bersama dengan bangsa lain yang berbeza etnik, suku, bangsa, bahasa, budaya dan agamanya.

agenda pendidikan negara bagi mencapai 'pendidikan berkualiti, modal insan terdidik dan negara sejahtera' dapat dicapai

Objektif & Kepentingan

- meningkatkan kualiti pelajar belajar dengan aktif dan berkesan
- interaksi seorang pendidik dan peserta didik dapat dilakukan dengan jarak jauh atau tidak langsung berhadapan.
- melaksanakan proses pembelajaran dengan mahapelajar yang lebih ramai dan tidak mengenal batas tempat, sehingga proses pembelajaran dapat dilaksanakan secara bersamaan di mana-mana dan bila-bila pun sesuai keinginan pelajar dan pensyarah

Metodologi

Dalam memastikan pencapaian dan kemajuan pelajar saya dalam setiap tugas dan aktiviti yang dijalankan, beberapa kaedah telah saya lakukan antaranya :

- Menggunakan teknik penilaian dalam bentuk ujian, pemerhatian (observasi), tugas secara individu atau kumpulan, dan kaedah-kaedah lain yang sesuai dengan karakteristik kompetensi dan tingkat perkembangan pelajar
- Menggunakan teknik 'ujian' adalah bentuk ujian bertulis, ujian lisan, dan ujian praktikal atau ujian melalui aplikasi web 2.0 seperti quizziz, quizlet live, kahoot, mentimeter dan sebagainya
- Menggunakan teknik observasi atau pengamatan dilakukan selama pembelajaran berlangsung atau di luar kegiatan pembelajaran dengan mengadakan aktiviti luar sebagai tugas seperti 'social experiment', temu bual bersama agensi berkaitan isu keselamatan seperti 'kematian bayi di tadika, pencemaran air sungai Klang, keselamatan semasa menggunakan 'escalator' dan banyak lagi
- Menggunakan teknik tugas sama ada secara individu atau kumpulan seperti tugas dalam bentuk komentar terhadap video berkaitan kursus, artikel dan lawatan ke muzium, tanah perkuburan, premis, pasar malam bagi memperoleh data secara langsung bersama responden
- Antara lain, saya turut menyediakan rubric dan eportfolio serta Instrumen penilaian hasil belajar dengan menekan beberapa kriteria penilaian khas antaranya
 - a) Isi dan fakta agar nampak kompetensi
 - b) Borang soal selidik dan soalan temu bual yang dibincangkan bersama pensyarah dan pelajar
 - c) bahasa, dengan menggunakan bahasa yang baik dan benar serta komunikatif sesuai dengan sasaran yang akan ditemubual atau responden
 - d) semua tugas pelajar akan dimasukkan dalam ePortfolio bagi memudahkan urusan pemantauan dan penilaian tugas yang dilengkapkan pelajar

Praktikaliti dan Kegunaan

- memudahkan proses P&P serta meningkatkan minat para pelajar belajar
- Pensyarah dan pelajar mempunyai masa yang lebih fleksibel untuk penyampaian dan pemahaman terhadap kursus yang diajar
- Proses P&P boleh dilakukan berulang kali tanpa bergantung sepenuhnya kepada pensyarah, contoh; melalui aplikasi multimedia (rakaman).
- Proses pembelajaran boleh dilakukan di mana-mana, asalkan ada capaian internet.
- Ringkasnya, bagi memastikan kestabilan infrastruktur sokongan kepada e-pembelajaran, seperti; capaian internet, alatan yang baik dan latihan kemahiran penggunaan adalah sepatutnya diberi keutamaan supaya pembudayaan e-pembelajaran secara berperingkat dan penilaian alternatif dapat direalisasikan tanpa sebarang masalah. Akhir sekali, diharapkan pengenalan kepada penilaian alternatif ini memberi input yang berguna kepada pensyarah dan pelajar untuk mempraktikkannya semasa menilai aktiviti dan tugas pelajar.

Kesimpulan

e-Portfolio mempunyai kelebihan untuk membantu meningkatkan pencapaian pelajar terutamanya dalam PBS. Kajian-kajian lepas mengenai pembelajaran secara kolaboratif yang digunakan bersama dengan e-Portfolio dilihat banyak memberi impak positif terhadap kejayaan peningkatan pencapaian

pelajar dalam penilaian yang dijalankan. Penggunaan e-Portfolio yang mempunyai elemen kolaboratif telah banyak digunakan sebagai alat untuk melaksanakan pentaksiran penilaian pencapaian pelajar. Kajian mengenai penggunaan teknologi seumpama e-Portfolio ini juga dalam melaksanakan penilaian terhadap subjek perakaunan semakin banyak dilakukan dan menunjukkan bahawa penggunaan teknologi dalam pendidikan semakin popular pada abad ke -21. Pentaksiran yang dilaksanakan di universiti dan bilik kuliah merujuk kepada proses pengumpulan, analisis, sintesis dan interpretasi keseluruhan maklumat berkaitan pengajaran dan pembelajaran adalah bertujuan membantu pihak universiti membuat keputusan bagi penambahbaikan serta mencapai matlamat dalam pengajaran dan pembelajaran. Pentaksiran dijalankan untuk mengetahui kekuatan dan kelemahan pelajar secara berterusan. Proses pengajaran dan pembelajaran tidak menjadi lengkap sekiranya penilaian tidak diambil kira. Di samping itu, dengan adanya penilaian dalam proses pengajaran dan pembelajaran ia dianggap aspek terpenting membantu meningkatkan keberkesanan proses pengajaran dan pembelajaran dan mencungkil potensi serta bakat pelajar

Penghargaan

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ID NO. UPM 019
TOPIC: Class Diagram Recommender System (CDRS): An Educational Tool for UML Class Diagram
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Abstract: Recommender Systems have been used in education domain and is considered as an efficient approach that can support education process. The recommender system is applied in e-learning activities for recommending resources (such as papers, books, and others) to the learners (students). Unified Modeling Language (UML) is a standard modeling language in software engineering and is used to model and document software. The UML has been widely used in software engineering courses, such as Software Design, Software Architecture, and Object-Oriented Analysis and Design. One of the most important diagrams in UML is UML Class Diagram. Studies reported that students have difficulty in designing class diagram to represent the structure of a software system. Thus, the objective of this project is to enhance students' learning of UML Class Diagram via recommender system. We have developed an educational tool known as Class Diagram Recommender System (CDRS) to support Computer Science/ Software Engineering students in learning and designing UML Class Diagram. The main idea of CDRS is to analyse and compare a UML class diagram created by a student with a collection of valid class diagrams stored in a repository. The CDRS tool will recommend several relevant UML class diagrams based on a problem domain that the student deal with. The CDRS used a Content-based technique and Jaccard Coefficient method to compare the similarity of a student's class diagram with the class diagrams stored in the repository. Thus, we believe that the CDRS can support and enhance students' learning in UML class diagram.

Key words: *UML class diagram, Recommender system, UML education, Jaccard coefficient method*

Introduction

Recommender system is a very powerful user-support tool which provides users with helpful recommendations. Recommender systems have been applied in different fields such as electronic commerce to recommend books or CDs on Amazon website, movies in MovieLens website, and in information retrieval (Linden et al., 2003, Elkamel et al., 2017). The content of recommendation can be used for learning goals. Recommender system in educational domain helps users to find suitable resources for getting better achievement of learning and development of competences in less time (Isinkaye et al., 2015). Software engineering field also acquire benefit from the advancement of recommender system technology (Elkamel et al., 2017). Marko and Andrea (2016) defined recommender system in software engineering field as "a software application that provides information items estimated to be valuable for a software engineering task in a given context".

In software engineering course, students need to learn on how to design software. Unified Modeling language (UML) is the de-facto standard formalism for the analysis and design of software. UML class diagram is one of the most important diagrams in UML diagrams. The UML class diagram model the software system in term of objects which are organized in classes and relationships between them (Berardi et al., 2005). However, the learning of UML Class Diagram at university level requires an adequate guidance and recommendations to enhance student's knowledge in modeling class diagrams. Previous researchers indicate that students having difficulties in learning UML modeling particularly UML class diagram in design software system (Boustedt, 2010, Siau & Loo, 2006). To address these challenges, we aim to develop a prototype of class diagram recommender system (CDRS) tool to support the students

in learning UML class diagram via recommender system. The following section explains the background of the work, our innovation approach, the importance to education, advantages and marketability of the proposed approach.

Background and Motivation

Recommender Systems have been used in education domain and is considered as an efficient approach that can support education process. Several studies have used recommender systems to support the education in software engineering field (Elkamel et al., 2017). For instance, recommender systems used in the programming domain to analyse users' generated programming codes for proving them with personalized and user-specified suggestions and educational materials (Ansari et al, 2017). Recommender system also applied in software design pattern to suggest design patterns (Palma et al., 2012). In software development life cycle, the design phase is the most important phase. Thus the architecture of the future software is established (Elkamel et al., 2017). The use of Unified Modeling Language in the design phase of software engineering projects is widely spread. The use of UML modeling language can assists software engineers to describe a software system by constructing a set of UML diagrams. The UML class diagram is one of the UML diagrams which are commonly used by students for modeling the static view of a software system. However, a few researches efforts have focused on using recommender system for supporting the learning of the design phase of software and learning of UML modeling particularly class diagram. Table 1 shows research tools in recommender systems in software design and UML education. The finding shows that the use of recommender system in UML class diagram for education purpose is still limited.

Recommender name	system	Domain of recommendations	The focus
UML sequence diagram recommender system (Cerqueira & Ramalho, 2016)	Table 1. Research tools in software design and UML education	Sequence diagrams	Recommend UML sequence diagrams for software design students
Design pattern recommender system (Suresh, Naidu, & Kiran, 2011)		Design patterns	Recommend design patterns for software design students
Client-server critique-based approach (Amirah, 2017)		Component in client- server	Recommend component in client-server architecture design
UML classes recommender system (Elkamel, Gzara, & Ben-Abdallah, 2017)		UML classes	Recommend UML classes in UML class diagrams.

Innovation Approach

Class Diagrams Recommender System (CDRS) is an educational recommender system intends to assists Computer Science and Software Engineering students in learning and designing structure of software systems using UML class diagram via the recommendation features. Students will interact with the CDRS tool as to receive several and relevant UML class diagrams in various domains. The recommendations help students for producing a good design solution of UML class diagrams. The objective of CDRS is to enhance the students' learning of UML class diagram and understanding through systematic recommendations. The main idea is to analyse and compare a UML class diagram created by a student with a collection of class diagrams stored in the repository. The class diagrams with the highest similarity value will be recommended by the CDRS tool in order to recommend most several relevant UML class diagrams based on a problem domain that the student deal with. The CDRS is using a content-based technique and the Jaccard Coefficient method to compare, check and analyse the similarities of a student's class diagram with the class diagrams stored in the repository. The tool supports four main features. First, the students are able to upload their own design class diagram into the CDRS. Second, the

tool is able to analyse, measure and check the similarities between class diagrams created by student with the validated class diagrams stored in a repository. Third, the tool is able to provide a similarity report that contains values of comparison between these two diagrams. Finally, the tool able to recommend several relevant class diagrams to the problem domain which student deal with. The overview of CDRS approach is shown in Figure1.



Figure 1: Overview of Class Diagrams Recommender

The Importance of Class Diagram Recommender System (CDRS) tool to Education

The main objective of this research is to provide an educational supporting tool that can facilitate the students in the learning of UML class diagram. Thus, the importance of this research for higher education is as follows:

1. Supporting students' self-learning in UML class diagram via recommender-based approach.
2. Ease of learning about UML class diagram via CDRS
3. Provide continuous self-learning to students and complement the conventional way of teaching and learning via the educational supporting tool CDRS.
4. Improve the skill and knowledge of UML class diagram among educators and students through systematic recommendations.
5. Equip the educators and students with useful UML modelling in class diagram capabilities.
6. Enhance the learning process of UML class diagram.

Advantages and Marketability

The work is about modeling and recommender system. Both areas have important educational and software industry benefits. The demand and market for UML modeling and recommender system are increasing. Our CDRS provides several advantages to education and academic community. These advantages are as below:

1. Improving modelling education through the educational supporting tool such as Class diagram recommender system
2. Enhance students learning and understanding in UML modeling through providing quick and systematic recommendations by CDRS.
3. Provides efficient modelling skills can be achieved by the educators or students through the use of CDRS.
4. CDRS supporting and providing continuous self-learning for the students.

The potential markets of CDRS are multiple. These potential markets include Computer Science and Software Engineering educators and students, Public and Private Higher Education Institutions, Government Agencies and Software Companies.

Conclusion

In this extended abstract we have described our educational tool Class Diagram Recommender System (CDRS) for supporting software engineering students in learning UML class diagrams. We have briefly presented several recommender systems in software design and UML education. These tools demonstrate that recommender-based approach is one of the effective mechanisms for providing user with helpful and useful recommendations. We also briefly explained the overview of our educational supporting tool i.e. Class Diagram Recommender System (CDRS). This research work is very much proof-of-concept that



CDRS will support the software engineering students to improve their knowledge and skills in modelling UML class diagrams.

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ID NO. UPM 020	TOPIC: Learning Plant via Augmented Reality Board Game

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Abstract:

According to a survey more than 40% of millennial and Gen Z in this world play video games every day. These generations prefer to play games on mobile or tablet compared to console games. However video games can lead to negative effects in their socialization in real world due to their attachment to virtual world compared to the real world. Augmented Reality (AR) is a solution of playing games on your mobile device combining virtual and real world when you are seeing the game bound to a real world around you. In this project we propose Mariposa Board Game (MBG) which the physical part of the game is a simple mat that acts as the game board and the AR aspects are overlaid onto the board and visible through mobile devices. MBG is design to educate players about Mariposa Christia Vespertilionis or butterfly wings plant in gaming style. In MBG players can conventionally play the game using the board while mobile game is used to roll the dice, scan the marker and insert the name of the players. The marker on the board is use to make the AR 3D mariposa plants to be visible and overlaid on the screen of mobile device. MBG can be played by two players or more which encourage communication between players in real world while having fun with fascinating experience using AR in the mobile game. MBG provide new knowledge regarding Mariposa plant and make the players expose in new way of learning plant. In future MBG also can be expanded in learning other type of plants or even animals. MBG project received a good feedback from the industry, where the Invent Cube Company expresses their interest in making MBG as their production product.

Key words: Augmented Reality, Board Game, Learning Plant.

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ID NO. UPM021	TOPIC: Impak 'SILA FOCKes SINI' Terhadap Penulisan Karangan Murid

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Abstrak:

Kajian eksperimental kuasi berkaitan kemahiran mengarang bermodelkan Kerangka E-Karang 'SILA FOCKes SINI' telah dijalankan terhadap 35 orang murid di sebuah sekolah menengah kebangsaan di Serdang. Objektif kajian adalah untuk mengenal pasti impak langsung rawatan menggunakan model ini kepada min pencapaian penskoran karangan murid dan impak tidak langsung iaitu menganalisis perbandingan hasil kerja mengarang berpanduan kriteria penskoran SPM oleh Lembaga Peperiksaan Malaysia serta kolerasi antara kedua-duanya. Dapatan impak langsung menunjukkan min pencapaian skor praujian murid pada iaitu 37.17 manakala min pencapaian skor pascujian murid ialah 73.03. Perbezaan min antara pascujian dan praujian ialah 35.857 iaitu menunjukkan satu peningkatan yang positif. Korelasi antara praujian dan pascujian ialah pada 0.690 dan statistik korelasi adalah signifikan ($p < 0.05$). Korelasi yang positif dengan koefisien yang tinggi ($r=0.690$) ini menunjukkan murid yang memperoleh markah yang tinggi pada praujian lebih cenderung mendapat markah yang tinggi dalam pascujian. Berdasarkan statistik, ujian t adalah signifikan ($t=-11.670$; $df=34$; $p<0.05$). Manakala dapatan impak tidak langsung pula menunjukkan peningkatan yang tekal kepada 11 kriteria yang dianalisis berdasarkan kriteria penskoran yang dikenal pasti. Inovasi pengajaran menggunakan Model E-Karang 'SILA FOCKes SINI' ini terbukti bukan sahaja menunjukkan peningkatan terhadap skor pencapaian karangan malah hasil penulisan jelas menjadi lebih berstruktur dan bersistematik tanpa menjejaskan kreativiti dalam penulisan.

Kata Kunci: model mengarang; kajian eksperimental; panduan mengajar dan panduan belajar

Kandungan

(a) Keterangan Inovasi Kerangka E-Karang 'SILA FOCKes SINI' (Description of your innovation)

Kerangka E-Karang Model 'SILA FOCKes SINI' dibangunkan untuk membantu bakal guru belajar dan mengajar kemahiran mengarang di sekolah. Kerangka ini memudahkan kerja karang mengarang tanpa meminggirkan aspek teori pengajaran dan teori pembelajaran bahkan ianya bersifat saling melengkapi. Aplikasi pengajaran daripada aspek kognitif dan aspek penulisan mekanis didapati lebih jelas, mudah dan lebih berstruktur. Kerangka asas mengarang ini bersifat sangat lestari kerana boleh diaplikasikan dalam semua bentuk penulisan tanpa menjejaskan kriteria penting yang membangunkan sesebuah penulisan. Selain memenuhi takrifan sebuah karangan yang lengkap, model ini turut berpegang kepada aspek paling asas penulisan iaitu ideasional, interaksi dan tekstual. Model ini sesuai diaplikasikan pada semua peringkat pembelajaran berdasarkan objektif sesuatu penulisan itu dibuat. Model ini membolehkan penulis memberi tumpuan kepada bahagian karangan yang hendak ditulis atau diajar. Setiap komponen yang membangunkan sesebuah karangan boleh diajar secara terpisah-pisah, bertimbal balik, rekursif malah boleh juga diajar secara linear kerana setiap elemen boleh berdiri sendiri tanpa menjejaskan kohesi dan koheren penulisan. Maka kemahiran dalam setiap elemen karangan dapat dipermantap. Model ini boleh memandu guru atau murid atau sesiapa sahaja mengarang daripada karangan yang mudah sehinggalah kepada karangan yang panjang dan kompleks.

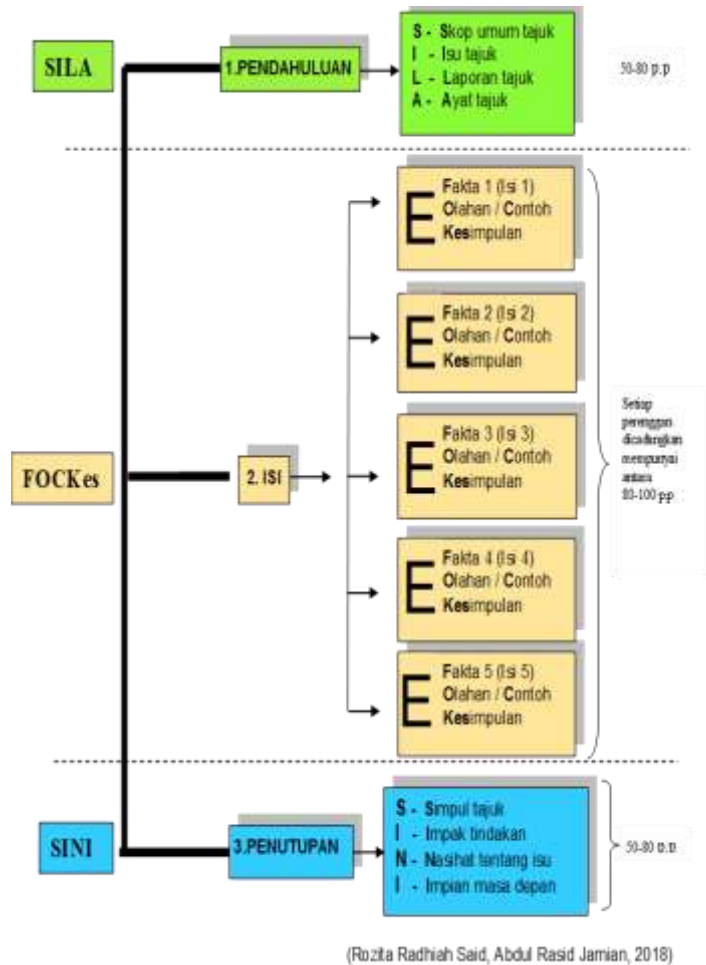
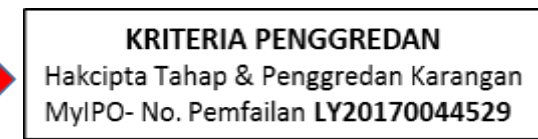
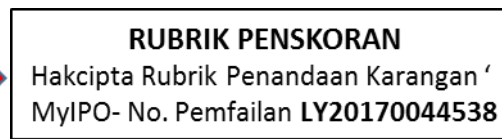
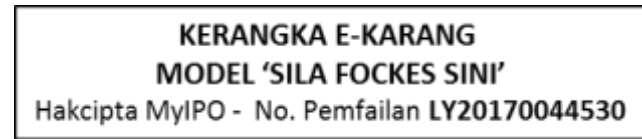
(b) Pembangunan Inovasi Kerangka E-Karang 'SILA FOCKes SINI' (Product development)

Model ini ialah karya asli ciptaan saya dan tidak diadaptasi daripada mana-mana model mengarang sedia ada. Model ini dirumus, dibangun, disusun dan dijemakan daripada data kualitatif kajian saya kepada bentuk model ini. Kerangka E-Karang dengan Model 'SILA FOCKes SINI' ini dibangunkan hasil daripada kajian kedoktoran saya bertajuk 'PENYAMPAIAN LISAN DALAM PENGAJARAN KARANGAN GURU CEMERLANG BAHASA MELAYU UNTUK MURID-MURID TINGKATAN EMPAT'. Kajian kualitatif satu kes pelbagai lokasi ini melibatkan 6 orang guru cemerlang Bahasa Melayu gred DG48 hingga gred DG52 yang mengajar kemahiran mengarang di dalam bilik darjah..Buku ini ialah produk paling akhir dihasilkan berdasarkan inovasi Kerangka E-Karang SILA FOCKes SINI dengan mengambil kira permintaan klien bagi memudahkan rujukan mereka.

Buku Model SILA FOCKes SINI Mengajar Mengarang. ISBN:978-967-344-744-2. Terbitan UPM Press. 2018



(c) Reka bentuk dan Proses (Design / Process).



BOKANG SKOR PENANGKAP - BAHAGIAN A

Kategori	Markah	Tahap (1)				Kriteria dan Vigorasi Penilaian	SKOR
		1	2	3	4		
S - Skop umum tajuk	10					(1 markah) • Pengiraan tepat, jelas dan mampan tajuk. • Memastikan apa yang ditulis dan berkesan berkaitan dengan tajuk. • Pengiraan terdapat dalam tajuk dan sesuai.	
I - Isu tajuk	10					(1 markah) • Pengiraan tepat, jelas dan mampan tajuk. • Memastikan apa yang ditulis dan berkesan berkaitan dengan tajuk. • Pengiraan terdapat dalam tajuk dan sesuai.	
L - Laporan tajuk	10					(1 markah) • Pengiraan tepat, jelas dan mampan tajuk. • Memastikan apa yang ditulis dan berkesan berkaitan dengan tajuk. • Pengiraan terdapat dalam tajuk dan sesuai.	
A - Ayat tajuk	10					(1 markah) • Pengiraan tepat, jelas dan mampan tajuk. • Memastikan apa yang ditulis dan berkesan berkaitan dengan tajuk. • Pengiraan terdapat dalam tajuk dan sesuai.	
Markah Penuh	20 m	Jumlah				Markah dipaparkan	

BOKANG SKOR PENANGKAP - BAHAGIAN B

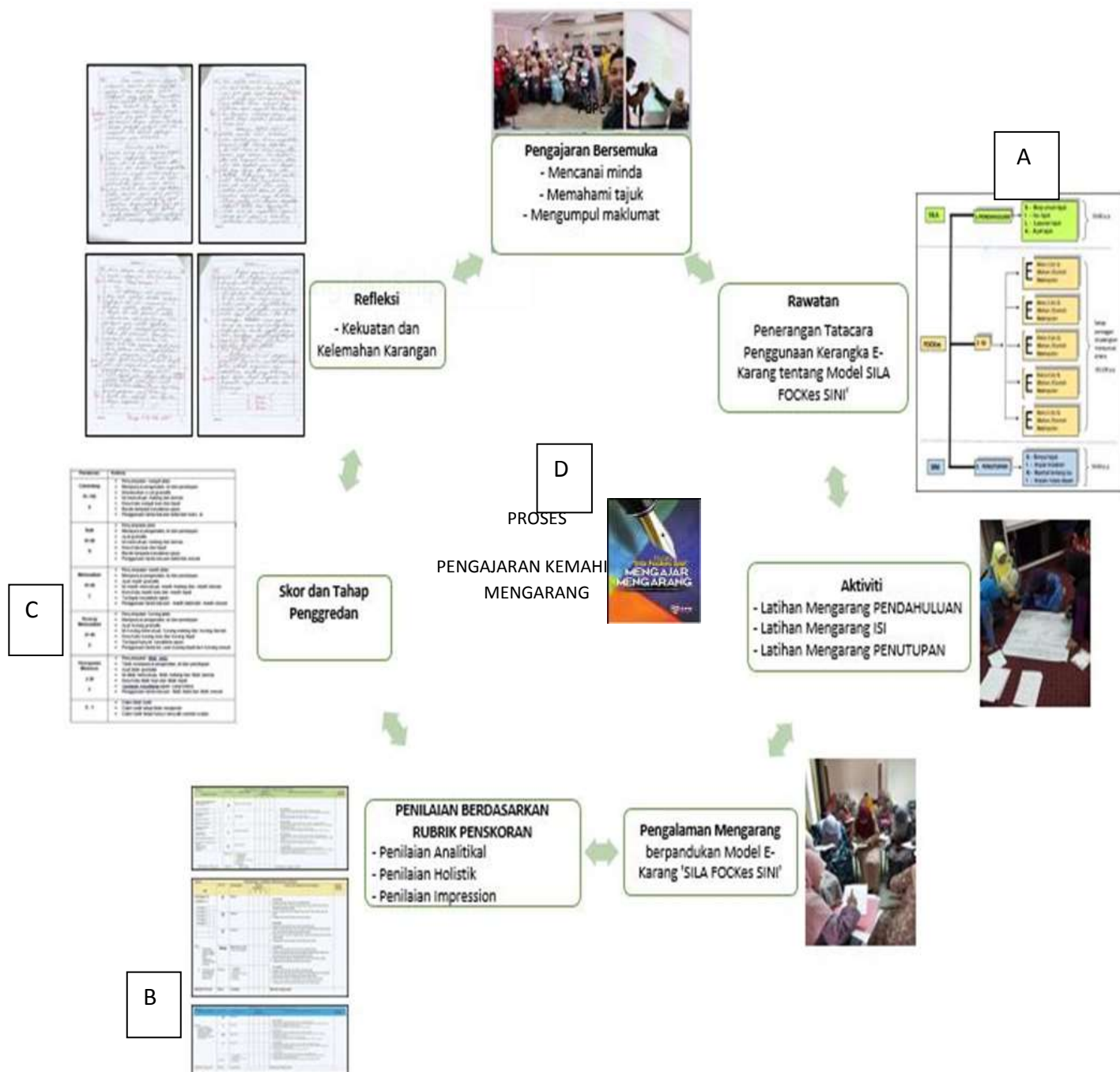
Kategori	Markah	Tahap (1)				Kriteria dan Vigorasi Penilaian	SKOR
		1	2	3	4		
F - Fakta	10					(1 markah) • Fakta yang benar dan mampan tajuk. • Fakta yang benar dan mampan tajuk. • Fakta yang benar dan mampan tajuk.	
O - Olahan	10					(1 markah) • Olahan yang benar dan mampan tajuk. • Olahan yang benar dan mampan tajuk. • Olahan yang benar dan mampan tajuk.	
C - Contoh	10					(1 markah) • Contoh yang benar dan mampan tajuk. • Contoh yang benar dan mampan tajuk. • Contoh yang benar dan mampan tajuk.	
Kes - Kesimpulan	10					(1 markah) • Kesimpulan yang benar dan mampan tajuk. • Kesimpulan yang benar dan mampan tajuk. • Kesimpulan yang benar dan mampan tajuk.	
Markah Penuh	20 m	Jumlah				Markah dipaparkan	

BOKANG SKOR PENANGKAP - BAHAGIAN C

Kategori	Markah	Tahap (1)				Kriteria dan Vigorasi Penilaian	SKOR
		1	2	3	4		
S - Simpul tajuk	10					(1 markah) • Simpul yang benar dan mampan tajuk. • Simpul yang benar dan mampan tajuk. • Simpul yang benar dan mampan tajuk.	
I - Impak tindakan	10					(1 markah) • Impak yang benar dan mampan tajuk. • Impak yang benar dan mampan tajuk. • Impak yang benar dan mampan tajuk.	
N - Nasihat tentang isu	10					(1 markah) • Nasihat yang benar dan mampan tajuk. • Nasihat yang benar dan mampan tajuk. • Nasihat yang benar dan mampan tajuk.	
I - Impian masa depan	10					(1 markah) • Impian yang benar dan mampan tajuk. • Impian yang benar dan mampan tajuk. • Impian yang benar dan mampan tajuk.	
Markah Penuh	20 m	Jumlah				Markah dipaparkan	

Penskoran	Kriteria
Cemerlang 81-100 A	- Penyampaian sangat jelas. - Mempunyai pengenalan, isi dan penutupan. - Keseluruhan ayat gramatis. - Isi mencukupi, matang dan bemas. - Kosa kata yang luas dan mampan. - Bersih daripada kesalahan ejaan. - Penggunaan tanda bacaan betul dan sesuai.
Baik 61-80 B	- Penyampaian jelas. - Mempunyai pengenalan, isi dan penutupan. - Ayat gramatis. - Isi mencukupi, matang dan bemas. - Kosa kata luas dan mampan. - Bersih daripada kesalahan ejaan. - Penggunaan tanda bacaan betul dan sesuai.
Memuaskan 41-60 C	- Penyampaian masih jelas. - Mempunyai pengenalan, isi dan penutupan. - Ayat masih gramatis. - Isi masih mencukupi, masih matang dan masih bemas. - Kosa kata masih luas dan mampan. - Terdapat kesalahan ejaan. - Penggunaan tanda bacaan masih betul dan masih sesuai.
Kurang Memuaskan 21-40 D	- Penyampaian kurang jelas. - Mempunyai pengenalan, isi dan penutupan. - Ayat kurang gramatis. - Isi kurang mencukupi, kurang matang dan kurang bemas. - Kosa kata kurang luas dan kurang mampan. - Terdapat banyak kesalahan ejaan. - Penggunaan tanda bacaan kurang tepat dan kurang sesuai.
Pencapaian Minimum 2-20 E	- Penyampaian tidak jelas. - Tidak mempunyai pengenalan, isi dan penutupan. - Ayat tidak gramatis. - Isi tidak mencukupi, tidak matang dan tidak bemas. - Kosa kata tidak luas dan tidak mampan. - Terdapat banyak kesalahan ejaan yang ketara. - Penggunaan tanda bacaan tidak betul dan tidak sesuai.
0 - 1	- Calon tidak hadir. - Calon hadir tetapi tidak menjawab. - Calon hadir tetapi hanya menyalin semula soalan.

CONTOH PROSES PELAKSANAAN MODEL, PENSKORAN, PENGREDAN DAN BUKU DALAM PENGAJARAN



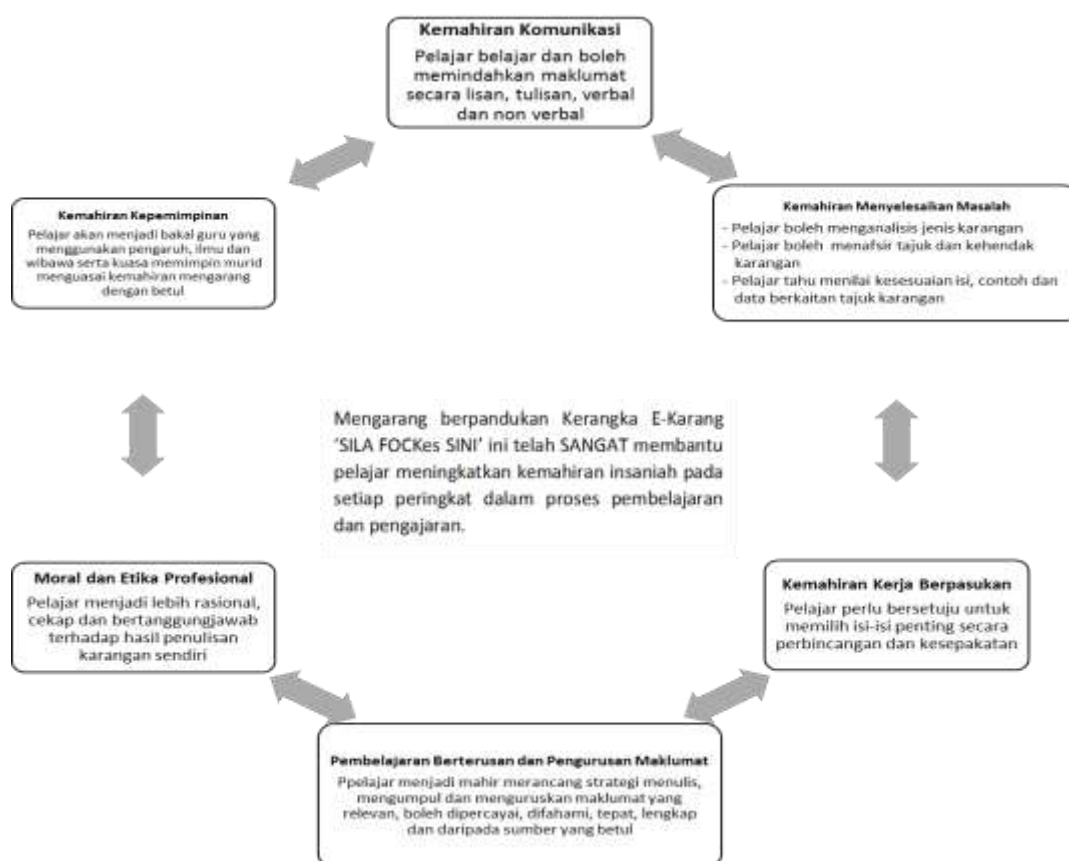
Isu berkaitan kemahiran mengarang sering dan masih diperdebat sehingga ke hari ini kerana kemahiran ini merupakan satu kemahiran yang paling tinggi dan sukar dikuasai. Justeru pelajar saya mesti menguasai ilmu belajar dan ilmu mengajar mengarang merangkumi aspek pemilihan teknik pengajaran karangan, menunjuk cara proses menghasilkan karangan bermutu serta kemahiran mengorganisasi maklumat yang relevan daripada pelbagai sumber. Aktiviti karang mengarang perlu melibatkan kekuatan mental, emosi dan psikomotor seseorang. Pelajar perlu memahami dan menguasai bagaimanakah proses mengarang berlaku bermula daripada kemahiran menyusun idea, penggunaan tanda baca, perbendaharaan kata, mengaplikasi, mentafsir karangan dan membuat penilaian. Bahkan mereka juga perlu menguasai teori dan amali pengajaran sebelum mereka boleh mengajarkannya kepada orang lain.

Kepentingan Inovasi kepada Pendidikan

Seorang pendidik bukan sahaja memerlukan kemahiran pedagogi dan andragogi malah perlu menguasai isi kandungan berkaitan bidang ilmu yang diajar. Ilmu pengetahuan yang bersifat transformatif mampu mengubah pandangan, tindakan, sikap dan amalan hidup seseorang terhadap sesuatu. Falsafah yang saya pegang ialah

'PENDIDIK PERLU BERILMU, BERPEGANG JUGA KEPADA ILMU UNTUK TUJUAN MENYAMPAIKAN ILMU' - Sodoqa Rasulullah saw-.

Dengan ilmu, seorang pendidik dapat mengeluarkan seseorang daripada kejahilan seterusnya membentuk keperibadian, memperbaiki akhlak, menyerlah kebijaksanaan serta meninggikan darjat seseorang supaya sentiasa relevan dan memberi banyak manfaat kepada kehidupan manusia yang lain. Pendekatan, kaedah, strategi, teknik serta aktiviti pengajaran kemahiran mengarang sangat bergantung kepada objektif PdPc yang hendak dicapai dan tujuan karangan ditulis pada hari tersebut. Semua ini bertujuan untuk memudahkan pelajar mengumpul, menyaring dan memilih maklumat berkaitan tajuk yang akan dikarang. Contohnya setelah pelajar selesai membuat pembentangan dan perbincangan barulah kaedah kuliah dilaksana untuk menerangkan tatacara mengarang yang betul menggunakan Kerangka E-Karang SILA FOCKes SINI. Murid diberi pengalaman mengarang berpandukan kerangka dan kemudian penilaian antara rakan sebaya akan dibuat berpandukan rubrik penskoran. Secara tidak langsung murid akan tahu dan faham apa dan bagaimana karangan mereka dinilai. Pada akhir pengajaran dan penilaian murid dan guru akan membuat refleksi keseluruhan pengajaran kemahiran mengarang untuk tujuan penambahbaikan.



Kelebihan Inovasi kepada Pendidikan

Kelebihan dan istimewa model ini, selain daripada sangat membantu guru meningkatkan prestasi kemahiran mengarang bagi mata pelajaran Bahasa Melayu, model ini juga memungkinkan guru memberi tumpuan kepada bahagian karangan yang hendak diajar sama ada secara terpisah-pisah atau keseluruhan. Pengajaran guru akan menjadi lebih mudah kerana setiap komponen yang membangunkan sesebuah karangan boleh diajar secara terpisah-pisah, bertimbal balik, rekursif malah boleh juga diajar secara linear kerana setiap elemen boleh berdiri sendiri tanpa menjejaskan kohesi dan koheren penulisan. Maka kemahiran dalam setiap elemen karangan dapat dipermantap. Model ini boleh memandu murid mengarang daripada karangan yang mudah sehinggalah kepada karangan yang panjang dan kompleks. Tuntasnya, untuk menjadikan murid penulis yang baik, fokus kemahiran mengarang bukan sahaja perlu memberi tumpuan kepada aspek luaran semata-mata malah fokus hendaklah bertumpu kepada apa-apa yang hendak diperkatakan dan bagaimana sesuatu itu ditulis atau diperkatakan. Keterangan cara penggunaan model ini boleh dirujuk pada nota slaid. Manakala penerangan yang lebih rinci boleh didapati di dalam buku Model 'Sila Fockes Sini' Mengajar Mengarang, Terbitan UPM 2017.

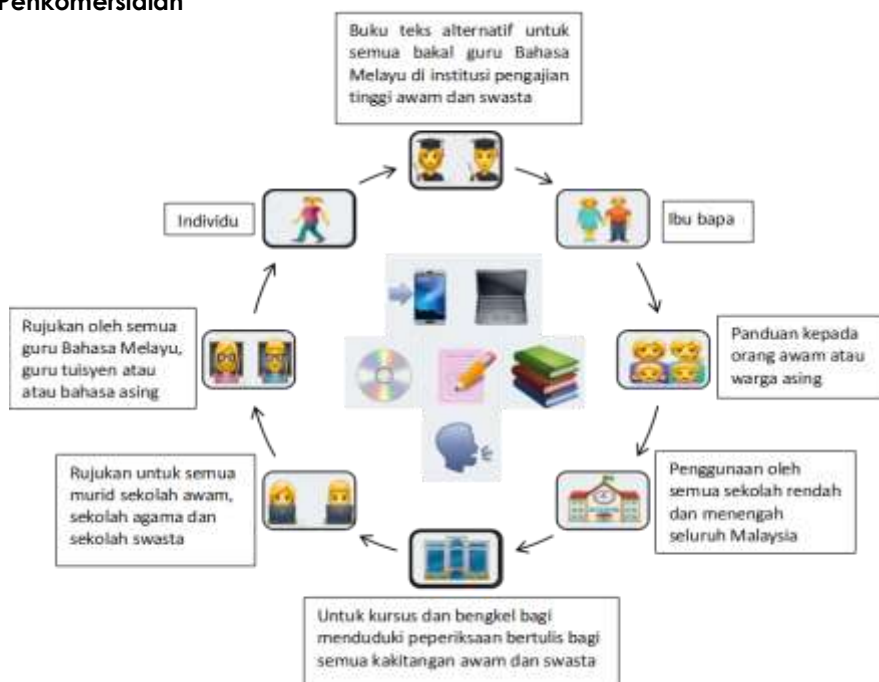
Setiap satu bahagian SILA/ FOCKes/ SINI dalam model ini boleh berdiri sendiri mengikut keperluan penggunaannya malah boleh juga digunakan secara berpasangan atau boleh juga sebagai satu pakej lengkap sekaligus.

(b) Manfaat kepada Pendidikan dan Komuniti

Inovasi Kerangka E-Karang 'Model SILA FOCKes SINI' ini boleh memberi banyak manfaat kepada

- semua guru sekolah menengah sama ada sekolah kerajaan, sekolah swasta, sekolah jenis kebangsaan, sekolah agama, sekolah tahfiz, sekolah antara bangsa malah sesuai digunakan untuk semua jenis sekolah harian atau sekolah berprestasi tinggi.
- semua murid sekolah pelbagai peringkat di Malaysia.
- semua penutur bukan Melayu kerana boleh diterjemah kepada pelbagai bahasa di dunia untuk tujuan pengajaran dan pembelajaran mengarang
- siswa-siswi bakal guru yang akan mengajar kemahiran mengarang di sekolah.
- semua pegawai di jabatan kerajaan atau kementerian atau syarikat swasta di Malaysia yang mempunyai peperiksaan bertulis untuk tujuan kenaikan pangkat atau yang setaraf dengannya iaitu boleh diberikan latihan jangka pendek atau latihan jangka panjang untuk menduduki peperiksaan.
- semua pegawai badan kerajaan dan bukan kerajaan yang kakitangannya terlibat dengan proses menilai peperiksaan bertulis kerana sesuai dijadikan modul latihan mengarang.
- individu atau orang awam untuk dijadikan sebagai rujukan
- ibu bapa yang berminat untuk belajar dan mengajar mengarang.
- semua guru tuisyen yang mencari-cari alternative mengajar mengarang yang berkesan.

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Abstract

Writing an abstract for a thesis or research article is not easy for most novice writers. Though it is a short writing task, knowing the abstract writing convention is crucial for the achievement of a successful writing outcome. In most cases, the learning of the writing convention is attained through writing manuals. *abstractchecker.com* is an online software that can help check the quality of abstracts. In this software, the uploaded abstract will be processed by sentences. The keyword matching technique is implemented in this software based on the keyword list that has been extracted from the corpus of abstract of final year project thesis from Department of Computer and Communication Systems Engineering, UPM and selected abstracts from postgraduate thesis archived by the UPM library. From the matching technique, the quality of an abstract is measured using the Abstract Quality Index (AQI). The AQI enables the quality of abstracts to be evaluated based on Santos' five move model and keywords related to each move. Santos' move for abstract writing is categorized as background, objectives, methodology, results and conclusion. Once an abstract is uploaded to the software, a summary of the AQI score is shown. The AQI score and the quality index of each of the five moves in the abstract are indicated based on different colour codes: Green - Adequate (100%), Dark Orange – Satisfactory (70%) and Dark Pink - Inadequate (30%). Three levels of adequacy according to the previous colour codes for each move will also be shown to guide users on the move that can be improve. It is hoped that with the existence of such free software, novice writers can learn how to write their abstracts with ease. Furthermore, writing instructors can use the software as a teaching tool to illuminate the five rhetorical moves in abstract writing. Additionally, editors of publishing houses could use it as an initial filter to screen abstracts which successfully comply with the writing convention of abstract writing.

Keywords: abstractchecker.com, abstract writing, tool, novice writers, writing convention

Content

An abstract has dual roles. It is a summary of an article's content and it also serves as an essential 'window' for readers to decide if they want to read the whole article further. However, writing an abstract by L2 novice writers has been an uphill task. Additionally, little is known as to whether computer-assisted language learning (CALL) has been used in the teaching and learning of abstract writing. A literature search confirms that several CALL studies (Reis & Huijser, 2016; Zaina & Mazdayasnab, 2014; Lavolette, Polio & Kahng, 2014) have been conducted on ESL/EFL writing; however, none has actually studied the use of a software as a learning tool in abstract writing. To empower the learners to write successful abstracts, *abstractchecker.com* was conceptualized and developed. The development of

abstractchecker.com is also timely as it fulfils the aspirations of the Malaysian Education Blueprint 2013-2025 (https://www.moe.gov.my/images/dasarkpm/articlefile_file003108.pdf) in 'up-scaling and intensifying the use of ICT' in classroom teaching and learning.

abstractchecker.com is an online software that can help check the quality of abstracts. In this software, the uploaded abstract will be processed by sentences. The keyword matching technique is implemented in this software based on the keyword list that has been extracted from the corpus of abstracts of final year project thesis from the Department of Computer and Communication Systems Engineering, UPM and selected abstracts from postgraduate thesis archived by the UPM library. From the matching technique, the quality of an abstract is measured using the Abstract Quality Index (AQI). The AQI evaluates the quality of abstracts based on Santos' (1996) five move model and keywords related to each move. The five moves are Move 1- Situating the research, Move 2 - Presenting the research, Move 3 - Describing Methodology, Move 4 - Summarising findings and Move 5 - Discussing the results (Pho, 2008, p. 234). These five moves provide the textual flow of the abstract which allows the writers' ideas to be organized coherently thus facilitating readers' comprehension of the text. The AQI score and the quality index of each of the five moves in the abstract are indicated based on different colour codes: Green - Adequate (100%), Dark Orange – Satisfactory (70%) and Dark Pink - Inadequate (30%). A screenshot of the online tool is shown in Figure 1.

Figure 1: Screenshot of the abstractchecker.com

This software has several advantages. It is available free online and therefore writing instructors can



use it as an instructional tool to teach abstract writing in writing classroom. Additionally, since it is web based, students can use the website to learn how to write good abstract at their own pace and time. This advantage augurs well for autonomous learning where students take ownership of their own learning. The software is also user-friendly. As shown in Figure 1 above, the user only needs to upload the abstract, key in information of email address and field of study. Immediately, the AQI result is shown on the right.

Since there is no such software in the market yet and with the above-mentioned advantages, this useful innovative tool for abstract writing has great commercial value. Such software will not only interest writing instructors but also editors from publishing houses who may use the software as an initial filter of good abstracts. The software can be marketed to both public and private tertiary institutions where it can be made available in their library website for the benefits of their postgraduates and academic staff.

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Haematology is defined as the study and treatment of blood disorders in medicine. With the myriad of disorders involved, the mastering of this subject may seem like a formidable task. Making Haematology more accessible and interesting through 'gamification' can be used to complement and reinforce the knowledge taught through lectures. Gamification employs principles and the design of play in a non-game setting interactively. An interactive environment is able to maintain learner interest and it also enables personalised learning and reinforcement when conducted properly. Evidence has suggested that learners gain knowledge, skills, and attitudes better and faster through interactivity and games and compared to the traditional instructor-based methods only. We have designed and developed a board game for Haematology to further facilitate the learning of the subject matter. This board game is based on the traditional snake and ladders board game with modifications including question and answer cards to assist in increasing the proficiency of Haematology among the players. The cards have three levels of difficulty (basic, intermediate and applied) and incorporates all the different subtopics of Haematology. There are several ways to play this game depending on the time allowed and the objective of the play. Certain answer cards of this board game have QR codes that enable players to view elaborated answers on our website (www.myhematology.com) or mobile phone app to further assist in their learning and discussion. The board game was playtested by a group of Masters of Pathology candidates who have recently concluded their Haematology lecture series. The students were required to read the instructions leaflet and set up the game board themselves. The students were given 60 minutes of play time and students' perceptions of the game were evaluated after. Overall, the preliminary playtest participants found the game to be enjoyable and engaging and agrees that the game does assists them in reinforcing their knowledge in Haematology. This is the first Haematology-based educational board game that has been created and can be useful for undergraduates, postgraduates and even clinicians in Haematology. It presents a complementary alternative, fun and interactive way for players to brush up on Haematology with their friends.

Key words: Board game, gamification, Haematology, interactive activities, e-learning

Table 1. Player perception about MyHaematology Q&A board game.

No.	Question	Response out of 6 testers
1.	On a scale of 1 to 5 (1 being poor, 5 being great), how would you rate your overall experience with this game?	4 rated 4, 2 rated 5
2.	Were there any phases of the game or elements of play which stood out as engaging?	Yes (6/6)
3.	Is this a game you see yourself playing frequently to improve your knowledge in Haematology?	Yes (4/6) No. Took too long (2/6)
4.	Does the game assist you in your Haematology studies?	Yes (6/6)
5.	Did the game feel like it was missing a crucial element?	No (6/6)
6.	Did the game meet its objectives?	Yes (6/6)
7.	Are the designs on the game board appropriate for play?	Yes (5/6) No. Maybe can use blue colour for the vessels (1/6)
8.	Is the size of the game board appropriate for play?	Yes (6/6)
7.	Would you pay RM 80 for this game and purchase it either for yourself or as a gift for someone else?	Yes (3/6) No. Too expensive (3/6)

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ID NO. UPM 024
TOPIC: Collaborative of Augmented Reality Mobile Application in Teaching Crystal Structure

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Abstract:

Augmented reality (AR) become extremely demanding technology in mobile device due to the capability of the technology to allow user to interact with virtual object. In this study, mobile application called *AR Crystal* have been developed for mobile learning which included AR as a component of toolkit. The objective of this study was to improve the teaching and learning process among Physics students on the topic of crystal structure. *AR Crystal* could helps students who have limited imaginative abilities to imagine the position of atom in crystals structures. *AR Crystal* was designed and developed by using Maya Autodesk and Unity for used on mobile phone thus offers flexibility for students to revise on the topic anywhere even without an internet connection. *AR Crystal* contained the following main topics: crystal system, lattice point and lattice translation vectors. The application allows students to explore and understand the position and arrangement of atoms consists of via AR. In this study, the effectiveness and usefulness testing on *AR Crystal* application in term of students understanding was performed before and after used the application. The post-test result shows significant overall cognitive improvement in student understanding, general knowledge and analysis. From the courseware evaluation survey, it was found that *AR Crystal* is capable to enhance the level of engagement and understanding the learning content. *AR Crystal* received a positive feedback from the students with more than 40% of respondent agreed that the application is excellent in term of flexibility, app contents, readability and user satisfaction.

Key words: Augmented reality, physics, solid state physics, crystal

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Abstract:

"The best teacher is EXPERIENCE". This is the spirit of the Service Learning in Microbiology course where students have to translate what they have learned in the classroom to the community. Students taking four different courses (Pathogenic Microbiology, Immunology, Microbial Genetics, and Service Learning in Microbiology) were given the topic of Sexually Transmitted Diseases (STDs) which they then have to Share-Transform-Disseminate (STD) to high school students. Students started with peer-learning by SHARING information virtually among the group members using Web2.0 tools, focusing on different aspects of STDs based on the four courses' learning outcomes. After understanding the topic given, they then presented the topic using posters and reports which were evaluated vigorously to ensure scientific accuracy. After obtaining the feedback from the lecturers, the students TRANSFORMED the scientific poster into a presentation mode of their choice. Finally, the students DISSEMINATED the information about STDs to school students where various activities were included to attract and to enhance the understanding of the school students. This project encouraged holistic learning as students have to study a common topic combining knowledge from four different subjects and then become teachers themselves to high school students to enhance learning whilst providing community service by creating awareness about STDs.

Key words: *immersive, peer learning, science communication, service learning*

Content:

Service-learning is becoming an important component of the teaching and learning process. Service learning is a method of encouraging student learning and development through active participation in thoughtfully organized service that is conducted with and for a community (Michaelson, 2002). The experiential learning nature of service-learning consists of service to the community and the learning that derives from that service coupled with academic theory. Service-learning can provide teachers with the opportunities to step outside the boundaries of traditional learning and teaching methods and assessment (Dawson, 2003; Deeley, 2013).

This project was conceptualized to address the following gaps in teaching and learning:

- Students often fail to connect the dots between lectures learned from different courses
- The traditional one-way lecture-learning type might not be effective in promoting immersive learning among the students.
- Information are abundant on the internet, but students may not be able to extract relevant and accurate information.
- Students rarely communicate science among themselves and to the public.

Therefore, a common assignment was given to the same student cohort consisting of 35 students taking four courses: Pathogenic Microbiology, Immunology, Microbial Genetics, and Service Learning in Microbiology (Figure 1). The students then had to integrate various aspects of **Sexually Transmitted Diseases (STDs)** into the assignment. They searched for information on STDs and used Web 2.0 tools to

SHARE information gathered among their peers and to be assessed by the lecturers. At the same time, we included service learning into this assignment to allow students to practice science communication and to inculcate the culture of “giving back to the community”. Students were required to conduct a STD awareness program in a secondary school. However, to ensure accuracy of data collection which was presented to school children, lecturers vigorously scrutinized their work through a 5000-word scientific literature report and scientific poster presentation to the lecturers first. Then, they **TRANSFORMED** the knowledge into infographics or any other suitable means of presentation and also created activities to **DISSEMINATE** knowledge and awareness on STDs effectively to the secondary school students. The students answered questions from the secondary school students on STDs and influenced them on the dangers of STDs.

Using this approach, students were actively involved in gaining and sharing knowledge instead of listening to lectures only which is in line with 21st Century Learning which encourages immersive learning. By teaching the secondary school students, they had to ensure that they fully understood the topic and were also able to present it accurately in an effective way to the target audience. The students were required to work as a team to collect information and follow through on the whole assignment till its completion. Throughout the course of the assignment, communication, leadership and time management are also important aspects in order to make sure the tasks run smoothly. The students also learned to manage various personalities and team members who were less committed. Additionally, the students enhanced their presentation and public speaking skills to the public.

Specifically, this approach enhances the students abilities:

- to use Web 2.0 tools such as Mindomo and Padlet to visualize the structure/outline of the assignment and share information amongst themselves
- to mine information and discriminate between genuine and false information
- to critically and creatively transform head-knowledge to a tangible presentation e.g. poster, reports
- to communicate scientific information to various target audience e.g. lecturers vs school students

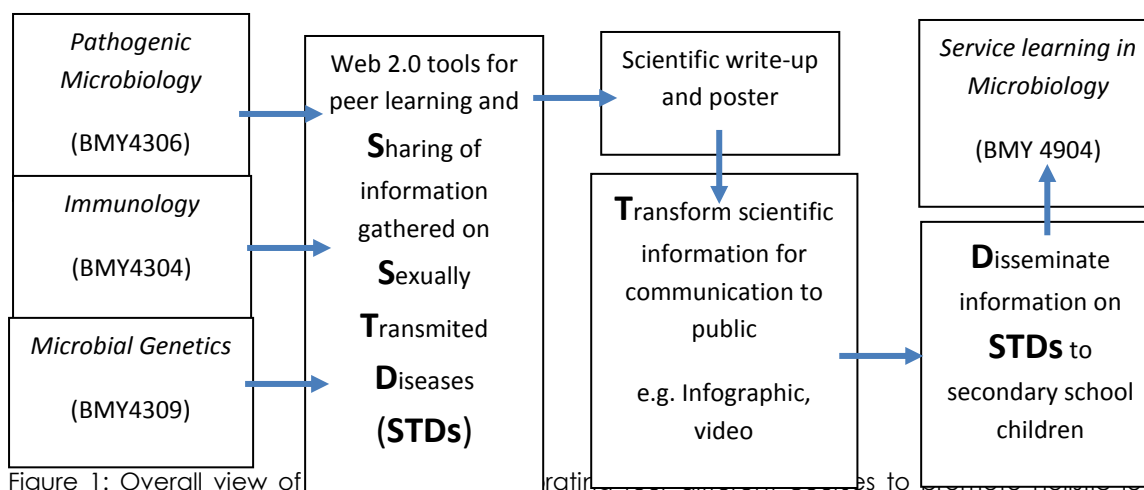


Figure 1: Overall view of the assignment process among students

The project gained good feedback from both undergraduate students as well as school students and teachers. Teachers were impressed at the level of participation and commitment from the secondary school students while the undergraduate students feedbacked that despite stress faced during vigorous drilling by lecturers to ensure accurate scientific knowledge given to the secondary school students, they thoroughly enjoyed the ability and process of bringing the knowledge to the community.

Finally, the project is extremely transferable and scalable as it can be easily adapted into other courses with the same cohort of students taking different subjects. In the case where there are more students, the lecturers can add more groups and also involve more schools in this project.



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Highlights: This work presents an analogy method to show how 'dam haji', a Malaysian traditional checkered board game can be used in explaining the pn-junction concept in Semiconductor Devices course. The aim of this work is to improve students' knowledge from fundamental charges interaction to how carriers move in the pn-junction through this two-player game elements. This can be achieved by using some simple analogy using black and red pieces of dam haji to aid students' conceptual understanding on majority-minority carrier concentrations in the *p* and *n*-types regions, hole-electron pair recombination and the drift-diffusion currents concept. For example, a good analogy can be drawn between the hole and electron majority carriers in the *p* and *n*-regions and a checkered square board (12 x 12 or 8 x 8) with dark and light colours. The findings reveal that teaching with analogy has a significantly positive effect on the elimination of misconception of pn-junction when circuit is applied under forward or reverse biased, therefore increasing students' academic achievements.

Key words: haji PN kit, dam haji, analogy method, PN junction, semiconductor, carriers.

Introduction

PN-junction diode is the building block of more advanced semiconductor devices including transistors and solar cells. However, previous results have shown that physics students may not have a good conceptual grasp of key concepts related to the diode by the end of the course. For example, many could not correctly differentiate between the linear (ohmic) and the non-linear behaviour of a P-N junction diodes. The students struggled with many fundamental both the drift and diffusion current phenomena of a P-N junction diode and the underlying explanation.

By investigating the roots of students' challenges, this study supports the need for new teaching approaches to facilitate better conceptual understanding in PN-junction not only for semiconductor devices course, but also to science subject in school.

Content

Apply the concept of carrier diffusion and drift, where the carriers move depending on the concentration of carriers. We can even make it as floor-board game by using students with different gender that act as hole and electron to symbolize minor and majority carriers regions. The attraction of feminine electrons and masculine holes pair (vice versa) creates recombination-generation (R-G) process.

Usefulness to the education

- Can be used across courses and faculty with similar concept
- Low-cost educational kit
- Increase learning experience
- Engaging students throughout learning process
- Can be embedded as hands-on teaching resources for secondary, foundation studies and tertiary education.

Value Added

- Role-play simulation activities floor-board game for real analogy
- Action research was undertaken
- Embedded game analogy to achieve learning objectives.

Background of the innovation : A fun-learning tool to understand p-n junction, the most important P-N junction diode, the building block of more advanced semiconductor devices!



Figure 1: Haji PN kit : A Fun-learning STEM-based kit that can be commercialised.

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ID NO.: UPM 028	TOPIC: INITIALIZING xR+ PLUG-AND-PLAY AUGMENTED REALITY APPS: EXPANDING GAMIFICATION FOR INSTRUCTORS AND CAPITALIZING INTEREST DRIVEN CREATOR THEORY FOR LEARNERS

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Abstract: Borrowing the intrinsically rewarding game elements into education; like rules, challenges/tasks, point-giving, levels, status, and victory; refreshes pedagogical approach and learning experience. Embracing gamification is proven to have a positive impact on learners, as it creates engagement, an utmost important value for any learning experience (Kapp, 2012, Arnold, 2014, Kiryakova, Angelova & Yordanova, 2014). xR+ is developed with the spirit to digitalize gamification and allow more instructors to adopt gamification into their pedagogies. This apps capitalizes the Interest Driven Creator (IDC) theory in initializing the development of its module. xR+ employs a technology-supported gamification elements that drives students to be habitually engaged in an interest-driven learning process that motivate learners to seek more knowledge voluntarily. When designing the xR+ module, the researcher elicited feedback from participants to answer the question: What are the elements that users like when engaged with xR+ and what elements should be added or removed from the module? Feedback were collected qualitatively through interviews and online survey questionnaire form from 66 participants. The element of point-giving, team-collaboration, and time limitation emerged as the most cited favourite elements; while stations check-ins are deemed important as evidence to enforce integrity and honesty among players. The design of xR+ prototype will be revisited based on the Recursive and Reflective Design and Development (R2D2) model as a strategy to concretize the design and development of the module.

Key words: gamification, augmented reality, mobile learning apps, Interest Driven Creator

Content

This research is focused on the apps module used by the researcher as a jumping board to develop a plug-and-play apps for instructors who wish to embrace gamification and augmented reality, even if they have little knowledge in it. Named as xR+, this module allows instructors to conduct a lesson through the use augmented reality and mobile technologies, and blend with the gamification approach as a learning strategy. xR+, which stems from XploreRAFE+, simulates the mechanics of "The Amazing Race" episodes from the American reality TV show, where participants work with partners to perform specific tasks within specific timeframe. XploreRAFE+ stands for eXploring (i) Real world not bounded by the classroom walls, (ii) Active participation in teaching and learning activities, (iii) Fun learning culture, and (iv) Engaging students throughout the learning process, while [+] depicts the Augmented Reality feature embedded in the module.

The design of xR+ borrows the intrinsically rewarding game elements; like rules, challenges/tasks, point-giving, levels, status, and victory; that triggers exploration and finding clues with competition elements. As such, learners are required to solve problems with their group members at a number of stations that are located at several buildings within the faculty area. These stations are installed with hidden clues, which are primarily in the form of trigger images or smart objects for Augmented Reality. These printed clues have similar design templates that enables learners to quickly identify them when seen. Each trigger image, when scanned with an Augmented Reality apps on mobile phones, will reveal overlay images in the form of texts or audio-visuals that prompt learners to perform specific tasks or answer questions. The answers must be written in a booklet that each group gets. These tasks from ten stations need to be solved within a 60-minute time frame. The first three groups to reach the finishing line with the most correct answers will win the game.

xR+ is developed with the spirit to expand gamification to instructors as a pedagogical approach and integrate augmented reality into instruction and learning, even if he/she has little knowledge about it. By providing the opportunity for instructors to employ gamification and augmented reality in instruction through xR+, learners will consequently get the benefits as well. It is seen as an innovative approach to foster motivation (Sailer, Hense, Mayr & Mandl, 2017) as it allows the freedom for trial-and-error and encourages learners to explore, collaborate, and exchange ideas among themselves without being pressured by their diverse abilities (Cohen, 2011). When gamification is employed, users or students who played the game, should feel that the activity is important to them and thereby will be self-motivated to perform it. As most learners in higher education institution today are digital citizens, this mode of instruction would be appealing to them. This prototype apps module capitalizes the Interest Driven Creator (IDC) theory (Wong, Chan, Chen, King, Wong, 2015) in initializing the development of its module. xR+ employs a technology-supported gamification elements that drives students to be habitually engaged in an interest-driven learning process that motivate learners to seek more knowledge voluntarily.

The prototype of xR+ module has been granted two copyrights and more copyright applications will be filed in the near future. The modules are in the patching process to be developed into a single apps that is more systematic in nature and able to capture learning analytics such as students' learning ability and the difficulty level of questions. xR+ has a huge potential to be commercialized and expanded beyond education because of its plug-and-play, like in training and tourism, to attract participants or tourists to gather more information about something.

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ID NO. UPM 030

TOPIC: Learn to Play (L2P), Play to Learn (P2L) and Learn to Learn (L2L): Integrating Universal Design for Learning (UDL) and Gamification in blended learning

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Abstract:

Blended learning has been proven to be one of the effective Teaching and Learning (T&L) approach as it provides round-the-clock access to learning resources without compromising face-to-face interaction. During flipped teaching, most educators use the pedagogical methods that they are comfortable with, overlooking students' individual difference and needs. This hinders effective implementation of T&L. By integrating Universal Design for Learning (UDL) and gamification, the current project introduces "play to learn, learn to play, and learn to learn" (L2P-P2L-L2L) system in blended learning to create flexible and engaging learning environment that accommodates the diversity of learners and educators. Without UDL, the gamified activities may favor the dominant students whereas the passive learners' participation is often perfunctory. Incorporated with UDL, gamified activities concern the diversity of students and become intrinsically motivating and purposeful. With gamification, UDL becomes vivid and easily to be implemented. The "L2P-P2L-L2L" provides diverse means of self-engagement, acquirement and expression of information. This allows students to find their own way of learning and develop deep-rooted desire to learn more. In the current project, our analysis showed that the "L2P-P2L-L2L" activities statistically positively affected students' examination scores of six courses from both technical and social sciences. Furthermore, students also developed proactive behavior in the classes. It is demonstrated that students were able to apply the skills and techniques that they attained from the "L2P-P2L-L2L" activities in their examinations. Proactive participation and punctuality were observed in the "L2P-P2L-L2L" classes. The current project is versatile and applicable in any other courses.

Key words: Universal Design for Learning, gamification, intrinsic motivation, L2P-P2L-L2L.

Content

Description of your innovation / product development / design / process.

By integrating Universal Design for Learning (UDL) and gamification, the current project introduces "play to learn, learn to play, and learn to learn" (L2P-P2L-L2L) system in blended learning to create flexible and engaging learning environment that accommodates the diversity of learners and educators. Such approach not only allows students to master their specific fields, but also master the learning process itself. This involves multiple ways of intrinsic self-engagement, presentation and representation of information, as well as expression of knowledge (Figure 1). The "L2P-P2L-L2L" project is an original idea that has long term and far-reaching impacts to students.

The integration of UDL and gamification leads to three novel interactions:

"L2P": The games enhance students' understanding of the subject. The games emulate rules and competitiveness of workplace.

"P2L": Students develop intrinsic motivation, become resourceful, strategic and goal-directed.

"L2L": Students master the learning skill, so it can be applied in their respective field and beyond.

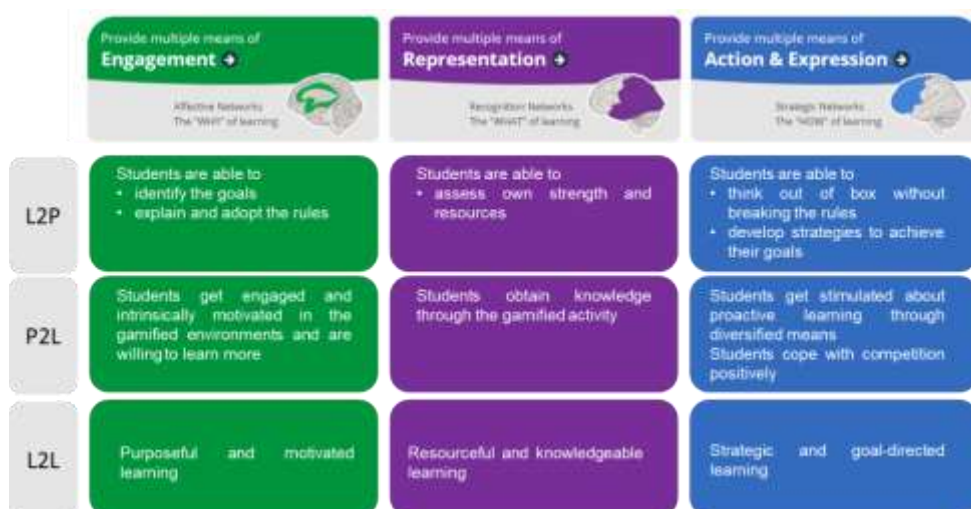


Figure 1: The concept of "L2P-P2L-L2L".

What is the context or background of the innovation / product development / design / process?

The UDL is a framework to guide the design of T&L environment that is accessible and exciting for all. UDL aims to alter the design of the environment rather than to force the students to change. When environment is deliberately designed to reduce barriers, all learners can engage in intrinsic and meaningful learning.

UDL covers three primary principles:

1. **Multiple means of engagement** - to tap into learners' interests, offer appropriate challenges, and increase motivation,
2. **Multiple means of representation** - to provide diverse students' options for acquiring information and knowledge,
3. **Multiple means of action and expression** - to give students' options for expressing what they know.

This flexible and tolerant learning environment allows students with individual differences to effectively master the knowledge of their respective fields. Throughout the UDL process, students realize that there are multiple means for self-engagement, presentation and representation of information, as well as expression of knowledge. Ultimately, the UDL supports students to become "expert learners" who are, in their own way, purposeful and motivated, resourceful and knowledgeable, and strategic and goal driven.

By convention, many educators assume T&L techniques fit for all students with different strengths and weaknesses. For instance, digital native generations respond differently to the e-learning in term of effectiveness. UDL is designed to accommodate the diversity of the students using neuroscientific findings. However, complexity in designing T&L activities in accordance to UDL might hinder educators from doing it. To kickstart the concept of UDL into tertiary curriculum, our team integrates gamification and UDL (Figure 2). With gamification, UDL becomes vivid and easily to be implemented. With UDL, gamified activities concern the diversity of students and become intrinsically motivating and purposeful.

Why are they important to education?

The current tertiary curriculum focuses on producing graduates of specific fields and is summative assessment-oriented (Rao,2015). Most educators use the pedagogical methods that they are comfortable with, overlooking students' individual difference and needs (Meyer *et al.*, 2014). This hinders effective implementation of Teaching and Learning (T&L). During flipped classroom lessons, some educators rely on conventional teacher-centered teaching while others adopt web tools and/or games. With the absence of a proper guideline, gamification may only stimulate extrinsic motivation of students. In other words, without a proper T&L design, these techniques only suit certain types of students. Hence, a transformative approach is needed to allow students mastering the learning process itself in addition to their respective fields. This is why the concept of "L2P-P2L-L2L" is introduced to deal with all the problems.

Please write any advantages of your innovation / product development / design / process towards education and community.

The "L2P-P2L-L2L" approach integrates UDL and gamification into blended learning. By doing so, it creates fun and engaging learning environment that teaches students to develop strategies and cope with competition positively. Integration of UDL accommodates students' individual differences. Thus, the current project is in line with the learning outcomes. In addition to mastering in their respective fields, once the students have mastered the learning process and skills, the impacts are long term and far-reaching for them. This implies that they can practice and discover their own ways of learning effectively.

Specifically, the outcomes of the three components of "L2P-P2L-L2L" are as follows:

1. L2P:

Students are able to

- identify the goals under competitive environment.
- explain and adopt the rules of the game.
- assess their own strength and resources.
- think out of the box without breaking the rules.
- develop strategies to achieve their goals.

2. P2L:

- Students get engaged and intrinsically motivated in the gamified environment and are willing to learn more.
- Students obtain knowledge through the gamified activities.
- Students get stimulated about proactive learning through diversified means.
- Students cope with competition positively.

3. L2L:

- Students master learning skills by realizing multiple ways for self-engagement, presentation and representation of information, as well as expression of knowledge.

The advantages of the project include:

- **Cost savings** – “L2P-P2L-L2L” emphasizes on the design of the gamified activities rather than adopting expensive game or applications. Thus, it is low in cost (if any) and effective.
- **Efficiency** – “L2P-P2L-L2L” are intrinsically engaging and foster the students in mastering the learning skills.
- **Recycles** – “L2P-P2L-L2L” aims to create flexible environment that accommodates the needs of different students, which is recyclable.
- **Versatility** – “L2P-P2L-L2L” is not exclusive to certain course or field, it is applicable to other courses.
- “L2P-P2L-L2L” allows the activities to be carried out with or without internet.
- **Sustainability** – Summing all the aforementioned features, the current project is sustainable and practicable.

Output

Simple regression analyses were performed on student's participation in “L2P-P2L-L2L” activity and examination marks. The results are summarized in Table 1. All courses showed that the dummy variable (“L2P-P2L-L2L” activity participation) is statistically positively significant at 1% significance level. This indicates that students' participation in “L2P-P2L-L2L” activities will have a positive impact on their examination scores. For example, the students who participated in “L2P-P2L-L2L” activities of the course named PKK3107 will have an average of 10.134 marks higher than those who do not participate in any “L2P-P2L-L2L” activity. This positive and significant results infer that “L2P-P2L-L2L” activities serve as an important factor that improves student's learning in a class.

Table 1 showed that the students who participated in “L2P-P2L-L2L” activities of the course named AKU4502 will have an average of 3.4% higher frequency to attend the classes punctually than those who do not participate in any “L2P-P2L-L2L” activity. This positive and significant results infer that “L2P-P2L-L2L” activities serve as an important factor that improves student's motivation in term of punctuality.

Table 1: Results of Regression Analyses Performed on Examination Marks for Individual Courses with L2P-P2L-L2L Activities

Course Code (PO)	PKK3107 (PO1)	BSM3501 (PO1)	FHP4103 (PO1)	PPT3801 (PO1)	PRT2008 (PO1)	AKU4502 (PO1)	AKU4502 (PO3)	AKU4502 (PO6) #
Constant	62.825*** (1.667) [37.668]	3.152*** (0.118) [26.742]	27.773*** (0.899) [30.886]	20.033*** (1.196) [16.742]	69.604*** (1.747) [39.711]	11.178*** (0.266) [42.033]	5.913*** (0.369) [16.006]	4.500*** (0.437) [10.289]
Dummy	10.134*** (2.018) [5.023]	1.239*** (0.158) [7.824]	3.017*** (1.130) [2.670]	10.549*** (1.852) [5.696]	15.147*** (3.007) [5.038]	2.510*** (0.357) [7.036]	2.113*** (0.549) [3.847]	3.400*** (0.587) [5.795]
R²	0.176	0.459	0.075	0.243	0.246	0.488	0.270	0.392
F-stat	25.23***	61.22***	7.129***	32.45***	25.38***	49.51***	14.80***	33.58***
n	120	74	90	103	80	54	42	54
No. of students participated in "L2P-P2L-L2L" activity	82	41	57	43	27	31	18	31

Note: *** indicates 1% significance level. The figures in parenthesis (...) and in bracket [...] represent standard deviations of parameters and t-statistics, respectively. PO1 represents knowledge-based summative assessment; PO3 represents critical thinking and problem-solving assessment. #PO6 represents ethics, morals and professionalism, was measured based on the percentage of punctual attendance of a student.

Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

The transformative "L2P-P2L-L2L" project involves educators of different fields covering both technical and social sciences. A set of scientifically proven guidelines have been developed for "L2P-P2L-L2L" and its effectiveness has been tested in various courses. By implementing the project, the outputs of these respective courses are encouraging. This implies that the versatility of the "L2P-P2L-L2L" system and its potentials to be adopted in any other courses and fields. In fact, the technique can be adopted in the outcomes-based education (OBE) system of the current tertiary curriculum to foster mastery of learning among students. Trainings and modules can be developed and used by other institutions.

Acknowledgements

We sincerely thank the Centre for Academic Development (CADE), Universiti Putra Malaysia for recognizing our work. We are grateful to the support and assistance given by our colleagues and students from Universiti Putra Malaysia in making this project a success.

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Abstract: Virtual Reality is likely to be a part of future education especially when addressing the Net Generation also known as Generation Why. Delivering course material via a virtual environment is beneficial to them because it offers the interactivity and social presence. As student and educator become interconnected through collaboration and interaction, the virtual environment becomes perpetual learning experience. VR in education offers the ability to travel and explore places or trough time without leaving the classroom. Plus, educator can demonstrate dangerous or complex task in the virtual, and students can try completing the task repeatedly, minus the cost and danger. Thus, we are introducing ViLeCube, which a virtual learning space for educators and students.

The basic concept of ViLeCube is cloud learning environment, where educator and students can join in from anywhere using their computer mobile device. Inside the ViLeCube, educator can directly speak and show simple gesture to interact with virtual course material. Gesture is control by gaze direction and locomotion inside the ViLeCube is control by walking in place. Students are able to respond in their lesson using voice, button selection and chatting (optional).

The first prototype has been develop and tested on several educators and students in the Faculty of Computer Science and Information Technology, University Putra Malaysia. A simple ViLeCube environment is created so that everyone has the ability to manipulate the cube space. The preliminary result reveals that educators and students are keen to use ViLeCube in their subject. The main obstacles are to make an easy content generation for ViLeCube and cloud storage to keep all information during the class. And since ViLeCube has shown great potential, this will be the next challenges to solve.

Key words: Virtual learning space, immersive, voice and gaze interaction, walk in place

Content

VR with immersive simulations are designed to create a compelling, collaborative, and participatory experience for the user, and often contain a variety of features not possible in the real world to enhance users' engagement and learning (Dawley, 2013). With an alternative of cheaper head mounted display, we witness an increasing number of immersive virtual environment available for both educational and entertainment purposes. VR in education offers the ability to travel and explore places or trough time without leaving the classroom. Plus, educator can demonstrate dangerous or complex task in the virtual, and students can try completing the task repeatedly, minus the cost and danger. Thus, we are introducing ViLeCube, which a virtual learning space for educators and students.

The basic concept of ViLeCube is cloud learning environment, where educator and students can join in from anywhere using their computer or mobile device. We design the architecture of ViLeCube application so that it can be assessable from any devices, platform and anywhere. The interactivity inside the ViLeCube, is a two ways communication. Educator can directly speak and show simple gesture to interact with virtual course material. Gesture is control by gaze direction (Pettersson, 2018, Vuopala, 2015) and locomotion inside the ViLeCube is control by walking in place (Ang, 2018) and autowalk. Students are able to respond in their lesson using voice, button selection and chatting (optional). This allows an immersive feeling inside the classroom.

ViLeCube is the first step in building an accessible education for everyone. The main advantage for ViLeCube is the ability to interact with multiple user (educator and students) in real time. Using ViLeCube application, educators are able to create advanced simulation, practicality of virtual exercises and exploration of virtual pace and time. Plus, ViLeCube is designed as a blank canvas, thus it provide the flexibility for educator to redesign their virtual learning space.

The first prototype has been developed and tested on several educators and students in the Faculty of Computer Science and Information Technology, University Putra Malaysia. A simple ViLeCube environment is created so that everyone has the ability to manipulate the cube space. The preliminary result reveals that educators and students are keen to use ViLeCube in their subject. The main obstacles are to make an easy content generation for ViLeCube and cloud storage to keep all information during the class. And since ViLeCube has shown great potential, this will be the next challenges to solve.



Figure 1: A brain rendered on mobile phone using place on HPD.

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ID NO. UPM032
TOPIC: HOLOVOICE : Voice Interaction Hologram Application
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Abstract: Using holographic viewing in education seems logical as the next step in advancing the education scene in Malaysia. Our prior solution for hologram viewer is using two key components which are a hologram pyramid display (HPD) and mobile devices to act as a projector. However, hologram viewer arise a new challenge on how to interact with the hologram contents. Since HPD is attached above a mobile phone, using finger swiping interaction is limited. Therefore, we introduce HoloVoice, a voice interaction application that interact with hologram contents. Simple words are chosen as basic commands for the interactions such as 'PLAY', 'NEXT', 'ZOOM', 'ROTATE' and colours such as 'RED', 'BLUE', 'YELLOW' and so on.

A survey has been carried out with the purpose of seeing the preference of respondents to 3D structure visualization in diagram (printed material), animation (2D digital content), rendered model (3D object), HPD approach and voice interaction. The survey conducted for computer graphic students in the Faculty of Computer Science and Information Technology, University Putra Malaysia with the number of respondents being 65 students. Overall, 87% of respondents believed that the 3D hologram pyramid display give better representation of the complex structure compared to others. 80% of respondents really enjoy the used of voice interaction in hologram viewer. However, some of the respondents find it difficult to pronounce some words correctly, thus resulting to frustration. None the less, the availability of HoloVoice really excites both educators and students. Surely, HoloVoice will add another exhilarating dimension in education scene

Key words: Voice interaction, holographic viewing, pyramid display, non-photorealistic rendering

Content

The process of assimilating and understanding complex structure is learnt by rote and usually as a 'surface approach' and may present major problem later. Standard teaching material such as diagram in textbook limits the understanding for complex structure in which requires the students to envision this structure in their mind. Another drawback with printed material is that the diagram does not support any interaction. Meanwhile, digital teaching material such rendered 3D model or animation are better in capability of interaction with the complex structure, but lacking in the depth and shape perception. By using holographic approach, students are able to view complex structure with intensification in the depth and shape perception, thus, leading to better understanding. However, hologram technology is not cheap and widely available to consumer. Thus, in our affordable solution for holographic viewer, we are using two key components which are a hologram pyramid display (HPD) and mobile devices to act as a projector. The prior component can be bought with less than RM50, making it affordable for students as tools for teaching and learning.

The invention of the hologram pyramid began as an optical illusion when Henry Dircks and John Pepper developed a technique called "Pepper's Ghost" during the 19th century. The HPD works by reflecting four sided images in 45 degree angle. The reflected images unified to form a perfect floating hologram structure. The HPD come in several design and sizes, where in our context, we pick the smaller size for mobile devices. Several studies have been published to measure the effectiveness of the hologram pyramid. Tiro and friends have made hologram pyramid with three sides of glass and a projection at the top to compare with technical drawings (Tiro, 2015). They found that the hologram pyramid provides better visual perception than technical drawings.

Using holographic viewing in education seems logical as the next step in advancing the education scene in Malaysia. Even though hologram is not a new technology, the potential of hologram visualization has yet to be tapped, particularly in teaching and learning cognitively challenging courses. Previous research concentrate in delivering a beautiful holographic visualization on 3D subjects by manipulating on shadows (Gingold, 2015), lighting (Wang, 2013, Vergne, 2009), transparency (Jordane, 2013)[6] or developing illustrative techniques of non-photorealistic rendering (NPR) (Qahtan, 2017, Northrup, 2000, Gooch, 1999). Our prior solution for hologram viewer is using two key components which are HPD and mobile devices to act as a projector. However, hologram viewer arise a new challenge on how to interact with the hologram contents. Since HPD is attached above a mobile phone, using finger swiping interaction is limited. Therefore, we introduce HoloVoice, a voice interaction application that interact with hologram contents. Simple words are chosen as basic commands for the interactions such as 'PLAY', 'NEXT', 'ZOOM', 'ROTATE' and colours such as 'RED', 'BLUE', 'YELLOW' and so on.

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None the less, the availability of HoloVoice really excites both educators and students. Surely, HoloVoice will add another exhilarating dimension in education scene. Through the HoloVoice, fresh teaching material will be accumulated, with endless interaction possibility. Let us all courageously to think outside of the box or in our case, one might say, to think outside of the 'pyramid'.

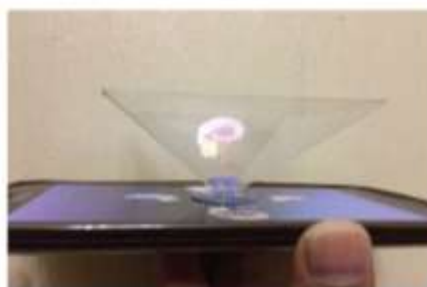


Figure 1: A brain rendered on mobile phone using place on HPD.

Acknowledgement

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(TRGS) TRGS/1/2015/UPM/02/7/2.

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ID NO. UPM 041
**TOPIC: DIGITAL BOARD GAME IN TEACHING AND
LEARNING OF BIOCHEMISTRY**
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Abstract: Biochemistry is a study of the chemical processes occurring in living organisms. This course covers many chemical reactions which involve different kinds of biomolecules and biological catalysts that usually will burden students to do a revision and understand the whole biological processes using conventional learning technique. To overcome this problem, educational game is one of the approaches that can enhance students' interest towards the biochemistry subject. Learning while playing is a type of pedagogy that has been known can enhance students' learning interest, motivation, active participation, concentration and engagement. Generally, most of the available games in teaching and learning are using traditional board game that involves cards and papers, and it needs spacious place to play. Up to date, none of the biochemistry board games are available which can be used to assist students in learning this subject. Therefore, we developed a digital board game with the aims can create an enjoyable and exciting learning process among biochemistry students. The digital board game can be installed in Windows computer and does not need a spacious place to play. Hence, the students can enjoy playing the game while having revision. This can create students' self-learning or group-learning process more efficient and timesaving. Apart from that, the use of gamification approach in teaching and learning can trigger lively discussion among students in which can further improve their understanding towards the subject. On top of that, the software platform developed can also be used for other courses to suite the students need.

Key words: Gamification, Digital board game, Biochemistry, Learning method, Fun Learning

Content
1. Description of Innovation

A digital board game pedagogical intention is to promote an enjoyable and exciting learning process. Our innovation is suitable to be used by biochemistry students as one of their revision materials instead of using lecture note and textbook. It is a computer-based and runs in any Window platform. The game contains all questions related to the biochemistry subject taken by students. The student needs to answer each question in a time frame given. The questions provided are basically based on learning outcome of the registered subject.

2. Background of the innovation

Biochemistry is one of the important subjects of biotechnology. It encompasses catabolism and anabolism processes involving different type of biomolecules and biological catalysts. Generally, the students find Biochemistry to be an interesting but difficult subject to learn. To overcome this problem, educational game was developed which involves game elements to enhance students' interest and understanding towards the subject (Morris et al., 2013). The use of gamification in teaching and learning of higher education students has been successfully carried out by many academic staff as this approach is able to create an interesting and enjoyable learning environment (Fleischmann, 2016). The main idea of this innovation is illustrated in Figure 1.

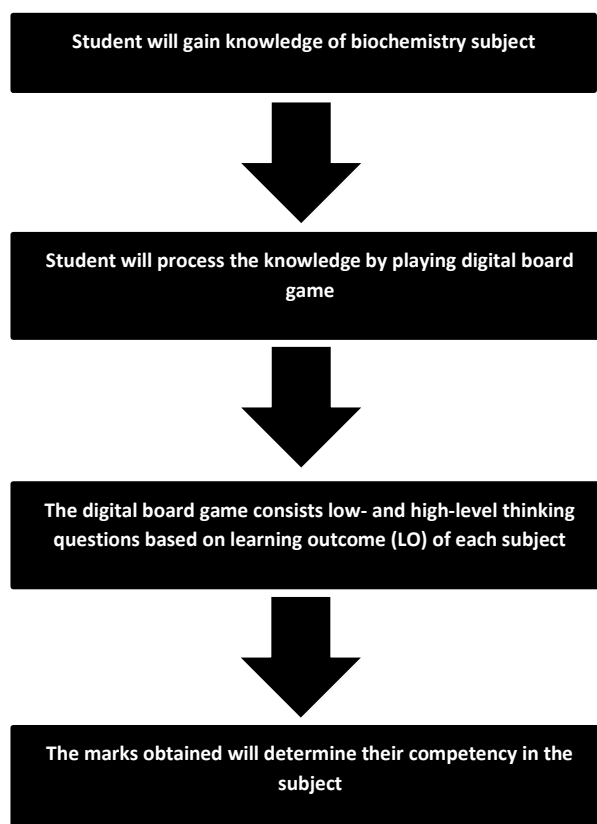


Figure 1. Flowchart of the teaching and learning approaches using educational game in biochemistry

3. Importance of innovation in education

Generation Z students are digital natives. Therefore, teaching and learning technique of biochemistry subject need to be improved to enhance students' interest and engagement. To fulfil generation Z needs, the digital board game can freely be installed in Window computer. So that, they can do their revision using digital platform.

4. Advantages of innovation towards education and community

Several advantages that can be highlighted are:

1. The software can be installed in Window computer
2. The use of digital board game can enhance students' interest and engagements towards the learning subject
3. The use of digital board game can create an enjoyable learning environment
4. The use of digital board game can enhance quality of self-learning or group-learning
5. The use of digital board game can reduce teaching and revision time



5. Commercial value

This innovation is suitable to be used in primary, secondary and tertiary levels of education. Therefore, it has high potential to be patented and commercialized.

6. Acknowledgement

We would like to thank Centre for Academic Development (CADe), Universiti Putra Malaysia for financial support.

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ID NO. UPM 043

TOPIC: NASH NAK SIHAT: LEARNING THROUGH SERIOUS GAMING FOR PUBLIC HEALTH AWARENESS

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Abstract: The past decade has witnessed a huge growth in serious game applications in public health awareness initiative. These games are designed to be both attractive and fun to the target audience, and to meet specific health education goals. NASH is a simulative game, designed to run on Smartphone, tablet or other mobile devices. This alpha prototype version developed by Ingenetworks Sdn. Bhd. Using agile design methodology consists of (1) diet module where the avatar will be fed food with different calories, fullness and nutritional values to satisfy its hunger; (2) exercise module where player will select proper and controlled activities for the avatar; and (3) rest module where the BMI will be modified proportionally according to the avatar's calorie deficit or surplus. The end result is determined based on the avatar's final BMI after the predetermined playing time has ended. The player is considered a winner when the final BMI falls between 18.5 to 24.9kg/m². A pilot study was conducted by UPM as the subject matter expert with players of various age-groups in informal settings which consist of User Acceptance Test (UAT) for NASH. Positive reactions were indentified but further and in-depth investigation is needed before the final version of the game can be released.

Key words: Serious Game, Public Health Awareness, Simulative Game, Body Mass Index, Informal Settings

Introduction

Serious game in educational context and for the purpose of learning and teaching is by no means a new phenomenon. Games have become a new interactive platform of education content and it provide an interactive collaborative element in the learning process. NASH NAK SIHAT is a simulative game, designed to run on Smartphone, tablet or other mobile devices. NASH was developed for UPM's Putra Future Classroom (PFC) with the vision of reforming the current traditional teaching system to a more interactive and engaging environment among the secondary school students. mobile devices.

Background

The goal of the game is to bring the avatar's body mass index (BMI) from an unhealthy level to within the normal range (18.5 to 24.9kg/m²), which players can achieve by controlling the amount of food and drinks that the avatar consumed and also through physical activities. The design methodology consist of diet module where the avatar will be fed food with different calories, fullness and nutritional values to satisfy its hunger, exercise module where player will select proper and controlled activities for the avatar, and rest module where the BMI will be modified proportionally according to the avatar's calorie deficit or surplus. A pilot study was conducted by UPM as the subject matter expert with players of various age-groups in informal settings which consist of User Acceptance Test (UAT) for NASH. Positive reactions were identified but

Importance of the study

NASH educational digital games can develop cognitive and metacognitive skills, help improve ICT skills, teach complex problem-solving, increase creativity, promote genuine collaboration between players which can enhance students' intrinsically motivating engagement in their learning better than when using traditional methods. By adding game elements in teaching and learning is predicted to have a positive impact in organising pertinent cognitive processing such as choosing relevant information as well as incorporating and linking it with existing knowledge. Thus, learning through serious game should be offered as an alternative in education and at the same time will improve health and be useful for younger generations to acquire suitable skills in an informal and attractive learning space. NASH provides several commercial values which include, gamify fitness, functional fitness, and interactive fitness that lead to the engagement of traditional fitness in a new way, turn workouts into game and learn the basic fundamental of health and fitness.



Figure 1: Commercial values of NASH NAK SIHAT

Acknowledgement

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ID NO.: UPNM 002	TOPIC: DIGITAL IMAGE PROCESSING MOOC

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Abstract: The Digital Image Processing MOOC is designed to support learning and teaching process on how to apply image processing techniques in developing a system. This tool introduces theoretical concepts and practical issues associated with image processing. The following topics are covered: image pre-processing, image enhancement, image segmentation and analysis. A special effort will be made to develop students' problem solving skills and engineering intuition in the subject area. The objectives of this tool is to increase students understanding, be knowledgeable and competent in applying the concepts, and should be capable in applying image-processing techniques.

Key words: *Digital Image Processing, Image Pre-Processing, Image Enhancement, Image Segmentation, Image Analysis*

Content

"One picture is worth more than ten thousand words" by Anonymous. In computer science, digital image processing is the use of computer algorithms to perform image processing on digital images. As a subcategory or field of digital signal processing, digital image processing has many advantages over analog image processing. It continues its cutting-edge focus on contemporary developments in all mainstream areas of image processing-e.g., image fundamentals, image enhancement in the spatial and frequency domains, restoration, color image processing, wavelets, image compression, morphology, segmentation, image description, and the fundamentals of object recognition. It focuses on material that is fundamental and has a broad scope of application.

The Digital Image Processing MOOC was developed to support the learning and teaching process on how to analyse image using image processing techniques and algorithms. By understanding the techniques such as the image filtering, morphology, edge, the learners can be implemented during the image based application development. Students will also be exposed to apply digital image processing techniques to particular applications such as for image recognition and classification.

This DIP course is included as one of the National Defence University of Malaysia's (NDUM) Massive Open Online Course (MOOC) subjects that can be viewed on OpenLearning's website as shown in Figure 1. All the content can be viewed online by just registering to the website and enrolled to the course. The main objectives for this course are to expose the students to the concept, task, technique and algorithm in digital image processing. Besides that, this DIP course tool introduces theoretical concepts and practical issues associated with image processing. With the guidelines, the students can have the idea to analyze images and develop a better image based application.

There are several benefits of learning this course. Firstly, to produce students with preferred way of interactive online learning. Students also be benefitted with the way of learning by connecting and sharing knowledge together. Furthermore, the modules are provided with the elements of multi-fusion

such as video, animation, graphics and interaction to enrich learning process. Lastly, this module also leveraging the student of GEN-Z onwards to collaborate amongst themselves.

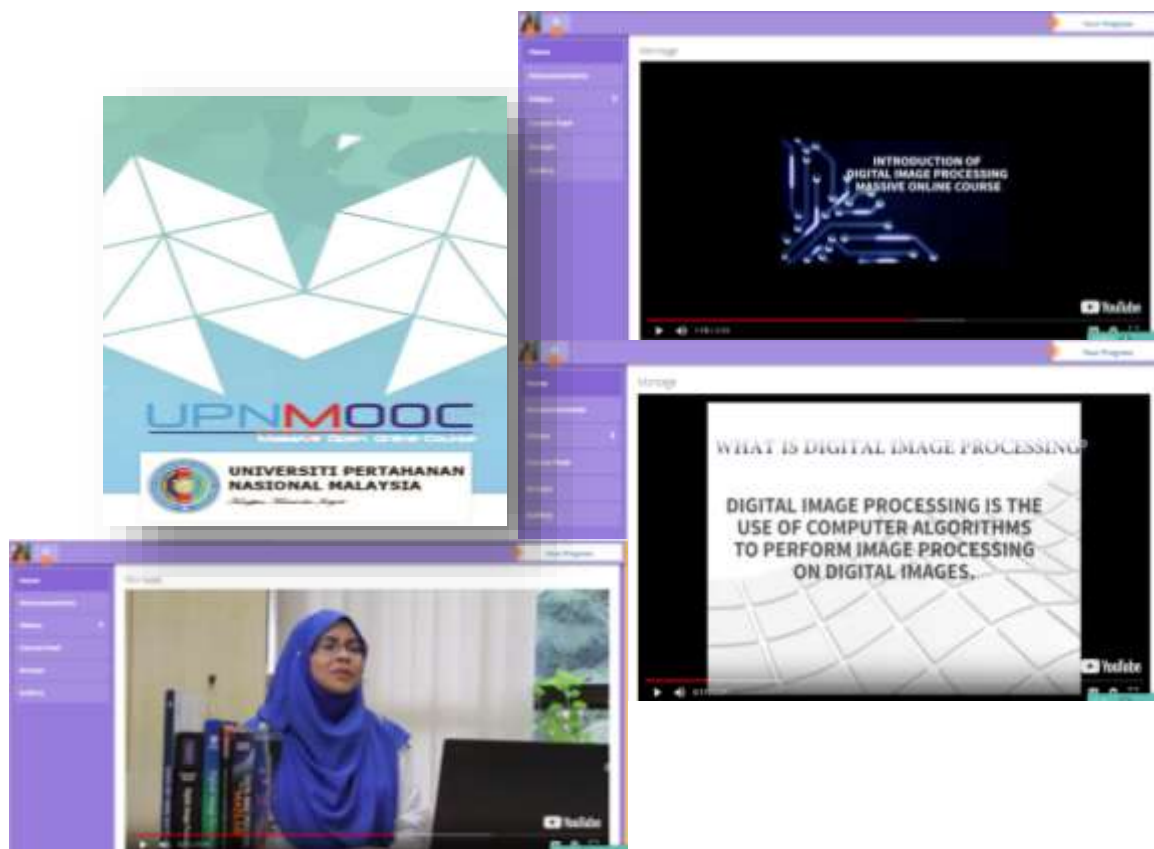


Figure 1: Interface of the DIP's MOOC webpage

Various changes can be made to this DIP MOOC. Currently, the innovators are working on Intellectual Property (IP) status as this innovation have a potential in the future undertaking and commercialization purpose.

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ID NO. UPSI 001

TOPIC: Edu4.0 in Arabic Language Learning for Tourism Purpose

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Abstract: This project presents a comprehensive open online course to learn Arabic language for tourism purpose. E-siyahah was developed by open learning platform along with the implementation of ADDIE instructional design model. E-siyahah was designed based on learner's needs, opinions, and suggestions. The lessons presented are very simple, easy, and interactive to meet the beginner's need who have no basic Arabic language. The use of multimedia element such as video animation, sound, text and picture assist the learners to learn Arabic language in interactive way and sustain their motivation and passion in language learning. In addition, open learning platform gives opportunities to learners to practice self-learning.

Key words: Massive Open Online Courses (MOOCs), Language Learning, Online Learning, Arabic Language, Arabic for Tourism Purpose

Introduction

The Malaysian Education Blueprint 2015-2025 has demonstrated the government's strong support towards online, or virtual learning through Massive Open Online Courses (MOOCs). According to the blueprint, learning technologies could significantly contribute towards optimizing student learning outcomes and providing better access to higher education. The blueprint has encouraged the use of varying forms set of educational approach and highlights the importance of lifelong learning programs. The blueprints also highlighted the government's intention to change the format of the undergraduate courses into more based on MOOCs by pushing for the use of blended learning in 70% of the programs offered in universities.

MOOCs contain online courses that can be accessed through the web and offer unlimited entries. According to G. James Mozoue (2014), it presents a model for delivering online learning content to anyone who wants to attend a course, with no restriction on attendance. MOOC combines both traditional and modern course materials for learning such as videos, reading, projects, assignments and more. Additionally, students can participate in interactive user forums provided by MOOCs and this interactive forum helps build communities for students, lecturers, professors, teachers and all users. MOOC is still a very novel development and educators had only started to adapt and use it since 2012. However,

some of the newer MOOCs use closed licenses for their course material but still maintain free access to users from around the world. On the other hand, in recent years, there are many MOOCs that started to offer paid subscription where in addition to free open source materials, these portals offer paid course materials that are exclusive to registered users.

Problem Statement

In Malaysia, Arabic language has been taught starting in primary school to university level. Many students are still unable to master Arabic language after spending many years in school and university. They do not have confidence to use the Arabic language inside and outside classroom (Awang et al., 2013). This is because teachers are more likely to use teacher-centered teaching strategies and this situation does not encourage student to be active nor participated the classroom (Mohamad, 2005; Ahmad et al., 2008). The lack of instructional tools, especially for teaching Arabic language has been discussed by many researchers in the attempts to improve the situation. Currently, the teaching and learning process in school is still use the white board to explain lessons to the students (Samah R., 2009). This shows that the use of instructional technologies such as computer assisted language learning, web-based learning, e-learning in Arabic classroom is still underutilized among teachers in schools (Ismail Z., 2008) and universities (Zainuddin, N. & Sahrir, M. S., 2015). The frequency of using computer-based instructional tool is still low and this is highly influenced by various factors such as teachers' preference to use traditional and non-computer instructional aids, poor computer literacy (Ismail, 2008), poor computer skills (Ghalib, 2000) and the lack of computer training (Ashinida Aladdin, 2004). Therefore, teaching Arabic for tourism purpose, it is proposed that the teaching process for the Arabic language is changed and transformed in order to equip students with Arabic communication for tourism purpose, as well as to fulfill the needs of Arab tourists (Samah, 2007).

The Development of MOOC Using the Iterative ADDIE Instructional Design Framework

The iterative ADDIE design framework was applied to develop the MOOC. The MOOC development comprises of five stages - Analysis, Design, Development, Implement and Evaluation. In this light, each stage was iterated based on the feedback, suggestions and opinions provided by users, developers and subject matter experts. The last iteration was conducted at the evaluation stage when the perceived learning requirements are fulfilled. The iterative ADDIE framework is presented in the figure below



Figure 7: Iterative ADDIE Instructional Design Framework

PHASE 1: NEED ANALYSIS

The first phase is need analysis, which focus on gathering, collecting, analyzing and summarizing data to design and develop the MOOC prototype. This phase is carried out by distributing questionnaire to the students which consist of a set of questionnaire. The prior needs analysis for the design and development of this MOOC prototype was conducted among 61 students majoring in tourism at UMK and KPTM. The MOOC was designed based on students' need, opinions and suggestions along with the implementation of multimedia theory.

PHASE 2: DESIGN PHASE

The design stage concerns with the conceptual construction of the MOOC. In other word, the process addresses questions such as what is the MOOC environment, what it can do and how to use it in order to fulfil the students' needs. The design stage is a process which describes the steps of MOOC design by preparing the storyboards and flowcharts; the function of storyboards is to give clear picture on how the MOOC should look like. Several web tools were added in this phase including the inclusion of videos by go animate, powtoon and screencast-o-matic, assessments by quizlet, and learning materials through padlet.

PHASE 3: DEVELOPMENT PHASE

The development stage is aimed to develop a prototype of the MOOC based on the storyboard by using the Open Learning® platform. All the learning materials were uploaded in the MOOC and the first prototype was reviewed by experts in Computer Assisted Instruction (CAI) and Arabic as a Second Language (ASL). The MOOC was then modified and improved based on experts' review before it was presented and used in teaching and learning sessions with the students.

PHASE 4: IMPLEMENTATION

During the implementation phase, the MOOC was used and tested by the target students. This phase involves delivering and distributing the materials to the target students, who consist of tourism students. This phase allows the materials to be tested to identify if they are well-functioning and appropriate for the intended audience.

PHASE 5: EVALUATION

A formative evaluation was carried out after the completion of the prototype. This process was carried out to measure students' acceptance level of using MOOC to lean Arabic language for tourism purpose. The study found that the majority of the students have positive view on learning Arabic language for tourism purpose through MOOC and many believe that its use has increased the students' desire to learn and motivate them to learn Arabic, as well as providing them with the opportunities to practice self-learning.

Conclusion

The study attempts to develop a MOOC to learn Arabic language for tourism purpose and this paper presents the development of the MOOC along with the implementation of iterative ADDIE instructional design framework. The implication of the findings suggests that the MOOC can be developed by providing interactive learning contents, exercises, and tests in the form of language games, high-quality multimedia elements and user-friendly interface. Moreover, with regards to the future direction, it would be interesting to investigate the effectiveness of MOOC whether it could enhance or disrupt the learning process.

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ID NO. UPSI 002
TOPIC: TEACHING WITHOUT CLASSROOM: HUMANIZING TECHNOLOGIES THROUGH EDUTAINMENT & INTERACTIVE TEACHING VIDEO IN MANAGEMENT ETHICS AND CORPORATE GOVERNANCE COURSE.

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Highlights:

We develop the EDUTAINMENT videos and INTERACTIVE TEACHING videos in delivering and disseminating knowledge in our Management Ethics and Corporate Governance Course. In line with the INNOVATION WITH SOUL concept, our EDUTAINMENT videos embedded elements that are related to human feelings. We acknowledge that by mixing the educational and entertainment element in the teaching and learning will improve students understanding and increasing student's engagement in each of the topic and to make teaching and learning experience to be both educational and enjoyable. The Edutainment Videos are fun and full of lesson. It has several elements that touches the heart of the audience with unique blend of comedy, surprise, thrill and sympathy. It tackles human issues such as greediness, equality, transparency and provide audience with additional engagement in understanding the value of life. It includes content intended to teach but also has incidental and occasional entertainment value. And it teaches the value of ethical principle beyond money and gold. In regards to Interactive Teaching Video, we include colorful and useful infographics, information on relevant websites and mind mapping in our videos to improve student's understanding on each topics. We also equipped our video with augmented reality and virtual reality technology in order to make the lesson more effective and exciting. In terms of usefulness, our videos are able to attract student's engagement to each topic in an exciting way. It has power to influence viewers' opinions and behaviors to do good and spread kindness in this world. Discrimination, greediness and poverty are among the main issues in the world nowadays. When we cultivate good ethical principle to the students, it surely helps to make this world a better place of living. In regards to commercialization potential, it is in the process to be registered for intellectual property (IP) given the uniqueness of the elements included in the video. We already submitted the documents required for an IP.

Key words: *Edutainment, Interactive Teaching Video, Teaching without Classroom.*

Introduction

We found that by using video via Open Education Resources (OER) is useful to make educational more fun and exciting, improve student's engagement to the course and it reduce cost by the university and by the students.

Content

Description of your innovation / product development / design / process.



We develop Teaching without Classroom by implementing Edutainment video, interactive teaching video as well as Outside Learning Activities for Management Ethics and Corporate Governance Course at Sultan Idris Education University.

Our innovation (both Edutainment Video and Interactive Teaching video) can be accessed through this link: <https://www.youtube.com/channel/UCw67fqBnZeUQNctNocu0g2A>

Our Edutainment Video can be accessed through this link:

Topic: Moral Reasoning in Business: https://www.youtube.com/watch?v=8v_0K2JDuis&t=1032s

Topic: Ethical Framework for Business Environment
https://www.youtube.com/watch?v=xbbkoHQ_JYk&t=946s

Topic: Ethics in Global Economy: <https://www.youtube.com/watch?v=mBycGlbU4HE&t=29s>

Topic: Fraud and Earnings Management: <https://www.youtube.com/watch?v=sETa8OquHKL&t=237s>

Topic: Corporate Governance Mechanisms: <https://www.youtube.com/watch?v=kTokRIwz1fk&t=302s>

The MOOC also can be accessed through this link:

<https://www.openlearning.com/courses/management-ethics-and-corporate-governance/HomePage>

What is the context or background of the innovation / product development / design / process?

- Management Ethics and Corporate Governance is a very dry subject with lots of facts and rules/ regulation that need to be memorized by students. The usage of edutainment and interactive teaching videos will be of useful to improve student engagement given that it elevates the enjoyment and motivation of the students at higher level.
- The Ministry of Education, universities and government are serious in promoting technology in education. University budget has been cut recently. Therefore, the utilization of videos are expected to help to reduce the operational cost at the university level, without compromising the quality of the education itself.

Why are they important to education?

- Our innovation elevates the education in Malaysia by promoting the concept of *innovation with soul*, where we embedded both elements of *technology and humanity* in our innovation.
This is in line with the government aspiration, where our Prime Minister, Tun Mahathir stated that *"..our education method has been outdated and we need new learning tools with computer and technology"* (17 May 2018; Bernama).
- The Education minister, Dr. Maszlee Malik also highlighted that:
"I envision that we want to develop the educational culture that focus on 3 main elements, that are joy, love and mutual respects" (reported by Sinar Harian).
The cultivation of humanity in technology area is crucial in developing the society with integrity, transparency and equality, and these are the pre-requisite in achieving world class citizen in highly developed nation.

Please write any advantages of your innovation / product development / design / process towards education and community.

The impact of our innovation can be classified into four main areas:

Creativity

- Our edutainment video is unique in the sense that it has a creativity value that relates to humanity and equality. Specifically, has elements that touches the heart of the audience through educational jokes, happiness, loves, thrill, sad and surprise. It has an element needed to combat kleptocracy, greediness, promote equality, increasing integrity, transparency and upholding humanity. Our innovation also intend to cultivate to our students that the value of ethical principle is beyond gold and money.
- Our Interactive teaching video improve student's understanding through videos, animation, infographics, links to the websites etc that makes learning experience more dynamic and practical.
- We believe that the 100% dependency on technology make the interaction between students decreased. We therefore make an outside learning activities which is something beyond normal boundaries. This is where we merge technology and human interaction in academic way. This can be accessed via this link:
<https://www.youtube.com/watch?v=3phsyfeyqyM&list=UUw67fqBnZeUQNctNocu0g2A>

Effective

- **Improve students' performance**

We conducted a research study in analyzing student's performance by comparing student's results for 2 different groups. Group A (75 students) is where students have been taught using traditional "chalk and talk" approach, while Group B (130 students) have been taught using "Teaching without classroom" approach. We run t-test to check the significant level for both groups and we found that student's performance in Group B is significantly higher in all assessment when compared to Group A that have been used "chalk and talk" approach. Our findings from this study have been presented in INTRED conference in UTeM in 2018. ⁴

- **Improve student's engagement**

We conducted a survey in gathering student's perception on the course. We found that majority of Group A (that have been taught using "chalk and talk" approach) found that the course is a bit boring, while we found that Group B noted that the course is interesting, exciting and more engaging to them. Our findings from this study have been presented in INTRED conference in UTeM in 2018.

- **Improve the dissemination of knowledge to Malaysian community as well as other countries**

Our innovation benefits the Malaysian community as well as overseas in the sense that our innovation has been viewed by audience from various countries including India, United States, United Kingdom, Australia, Canada, Ghana, etc. We gathered this data from our analytic information from our You Tube channel.

- **Increase sustainability of knowledge transfer without limits**

Our innovation is practical to the students/ public given that all of them can access the video at any time that they like.

Significant

- **Reduce electricity cost** – cost of air-condition, cost of light, projector, computer, audio system, etc.
- **Reduce student's travelling cost (students are the stakeholders)** – student not need to travel to the class too frequent. Reduce fuel and money for them and they can save the money for other expenses.

⁴ The full paper of this study can be obtained upon request from the first author, Dr Nooraisah Katmon.

- **Reduce operational cost** – cost of equipment and cost associated to the maintenance of equipment in the classroom (e.g. foreman cost, guard cost, etc).
- **Increase student's practicality in accessing the lecture.** Student can access the video lecture at anytime, anywhere!

Relevant

- **Student's testimony**

We received very positive remarks from our students. We gathered this information through the survey and 130 students provide us with very positive feedbacks. We provide here with some of the comments.⁵

"We are so excited to see your video Dr. The features, the contain were so clear. The video quality and sound were really clear and no problem from the both side. Apart from that, I can repeatedly play the video at any time I like. It is so easier to me to do revision. And Dr. Aisyah, Dr was so cute in the video. Cuteness overload. I keep smiling while watching your video. Thank you to make things so easier for us Dr."

"Dr. Aisyah, you are very creative in planning your teaching and learning activities. This is surely very different than the chalk and talk approach."

"I like and love how you attract us with the interactive teaching video, it's so easy to understand because you highlight and focus to the important point".

"I love Edutainment and Interactive Teaching Video very much Dr. I find it very easy to understand. Thanks to the subtitle. Besides, it is very flexible. We can watch it on our free time"

"I think the videos are good and fun because can easily access the courses from my comfort home... I don't need to take public transport to get to the new campus, and not need to get up early to get dressed for the class".

"Online classes are great. I love the videos! Very interesting Dr. And of course the effort you put on the video makes me more interested in this course. Thank you Dr."

"Lecturer is awesome. She makes this boring subject become more fun"

"Lecturer is very kind and nice. I like the way she teach using video, MOOC and online class"

"I love this course. The Best class ever. I hope I will be in this class for the rest of my life".

"I like Dr Nooraisah because she is pretty, gorgeous and love to smile. I like her style about teaching without classroom".

Some of the positive comments can be viewed here in our you tube channel:

<https://www.youtube.com/watch?v=3phsyfeyqyM&list=UUw67fqBnZeUQNctNocu0g2A>

- **Increases student interaction with the instructor**

In our MOOC, we have active interaction with our students. As for previous semester, we received more than 500 comments from the students. We also discussed about the current issues/ cases in the topics.

⁵ The full report of the student's testimony is available upon request to the first author.

We also received constructive comments in our youtube video.

- ***Excellent content of video based on high impact research and publications***

In ensuring that the contents our videos are up to date with current debate in Business Ethics and Corporate Governance area, the instructor of this course has published several papers in high impact journal. Journal of Business Ethics is listed in **Anugerah Akademik Negara** (Kategori Makalah Jurnal) and nominated for the award for the year 2018.

(a) Katmon, N. and Farooque, O. A. 2017. Exploring the impact of internal governance on the relation between disclosure quality and earnings management in the UK listed companies. Journal of Business Ethics, 142 (2), 345-367.

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- ***Cultivate the community with high integrity and transparency in all dealings***

Cultivating the community with high integrity and transparency is crucial in ensuring high ethical principal and values being practices in daily activities in life.

- ***Driving Malaysia to be one of the developed countries***

Developed nations such as the UK, Sweden, Australia and New Zealand are having low corruption index. Integrity and transparency in all aspect of system improve income quality and distribution, increase the effectiveness of resources utilization and ensuring that the resources are not just circulating in the hand of few. This characteristics will improve

Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

- **Strategic collaboration with other universities:** Experts in business ethics and corporate governance is limited in Malaysia. We already identified several universities that lack of such expertise (e.g. UTeM and UTHM). We therefore intended to have a strategic collaboration with universities that lack of such expertise.
- **Intellectual Property:** Our videos are all in progress to be registered for an intellectual property. We already submitted all required documents in June 2018 and we are now still in the process.

ID NO. UPSI 003	TOPIC: RE-ENGINEERING COMPUTER ARCHITECTURE AND ORGANIZATION (CAO) COURSE THROUGH PROJECT-BASED LEARNING (PBL)

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Abstract: Computer Architecture and Organization (CAO) course mainly emphasizes the association between computer hardwares and software. It also focuses many aspects of programming and software component in computer system. The course taken by first year Computing Department students, Universiti Pendidikan Sultan Idris (UPSI). Based on the results of our preliminary investigation, it demonstrates that over 64.70 percent of the students are not able to recognize and identify the computer component and its function correctly. For this reason, it is important to provide best practice in learning experience to allow students to acquire knowledge, take initiative and explore learning activities. Through Project-based Learning (PBL) approach, we design an activities that accommodates students in experiential learning by design and develop from three activities; i) PC hardware component (identify & recognize); ii) PC assembling and PC installation; and iii) PC troubleshooting;. In this research work, we ask them to use recycle computer component to produce new green technology product (E.g.: MyPC-Kit). As a results, this activities shows positive effects on student learning where 94.4 percent of the students score high marks in Practical Lab Test conducted at the end of the semester.

Key words: Computer Architecture And Organization, E-Waste, Project-Based Learning, PBL.

Content

Please address as many of the following sections as possible in your paper, as relevant.

Description of your innovation / product development / design / process.

In this research works, we introduced a new way to teach Computer Architecture and Organization (CAO) course using Project-based Learning (PBL) approach. We designed an activity (Three activities: i) PC hardware component (identify & recognize); ii) PC assembling and PC installation; and iii) PC troubleshooting) that involves extensive hands-on with the computer component and software installation. Students are required to design and develop a new green technology product from recycle computer component.

What is the context or background of the innovation / product development / design / process?

Our main motivation to conduct this research are based on our preliminary investigation towards students knowledge about computer system. This includes their knowledge on computer hardware and software. At Universiti Pendidikan Sultan Idris (UPSI), COA course is taken during first year of studies. Therefore, such finding towards students understanding and performance has become our main concern. For this reason, we proposed PBL approach in this course.

Why are they important to education?

Education Contribution

- **Experiential Learning** - Helps learners on assembling computer hardware from scratch.
- **Critical Thinking** – Motivates learners to familiarize with computer components to bring up more invention and innovation rather than consuming it.
- **DIY (Do It Yourself)** - effective and informal learning environment and helps learners to practice real world scenario in assembling computer parts, software installation and PC troubleshooting.

Please write any advantages of your innovation / product development / design / process towards education and community

Community Contribution

- **New business opportunities** - Inspires, motivates and nurtures many young minds to create new invention and innovation on computers.
- **Green Technology** - Helps reduce the amount of e-waste which is certainly detrimental to environment.
- **E-waste Management** - Contributes in reducing cost of e-waste disposal for country.
- **Environmental Engagement** - Recycle and reuse disposal electrical computer components can reduce the impact of pollution on environment.

Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

- **Learning Institution** - Can widely use among higher institutions, polytechnics, community colleges, schools and vocational college.
- **Low Cost** - Cheap and affordable new product (e.g.: MyPC-Kit, display board and decoration).
- **Business Opportunity** - e-Waste create new business opportunity and sustainable source of investment.

Acknowledgement

We are grateful for the xyz. Research Management and Innovation Centre (RMIC), UPSI for funding this project under 'Geran Penyelidikan Universiti'. Research Code:2017-0185-104-01

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ID NO. USIM 001

TOPIC: E-FIQH SOLAT OKU

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Abstract: Ibadat solat merupakan suatu tuntutan dan keperluan bagi umat Islam sama ada bagi golongan normal mahupun golongan orang kurang upaya yang wajib dilaksanakan mengikut kemampuan mereka. Bagi golongan OKU bermasalah pendengaran atau pekak kaedah penyampaian dan pendidikan ilmu solat sangat memainkan peranan yang penting. Namun berdasarkan pemerhatian di Malaysia, masih belum terdapat garis panduan khusus berkenaan fiqh solat OKU pekak yang boleh digunakan untuk tujuan pengajaran dan pembelajaran. Kekurangan guru agama yang mahir berbahasa isyarat dan kesedaran ilmu agama dalam kalangan orang pekak juga menjadi faktor keterbelakangan pelajar-pelajar OKU dalam memahami permasalahan agama (PRISMA, 2017). Oleh itu, produk inovasi ini diperkenalkan bagi memudahkan golongan OKU pekak mempelajari dan memahami solat dengan lebih mudah dan sahih. e-Fiqh Solat OKU sebagai inisiatif dan langkah progresif dalam pengajaran dan pembelajaran atas talian sebagai alat bantu mengajar kepada guru untuk memberi pendidikan dan kefahaman yang jelas tentang solat bagi OKU pekak. Inovasi e-Fiqh Solat OKU ini merangkumi video bahasa isyarat yang menerangkan permasalahan fiqh solat OKU pekak secara santai dan bersahaja. Pembangunan e-Fiqh Solat OKU ini diyakini sesuai dijadikan sebagai panduan dan rujukan dalam pengajaran dan pembelajaran untuk guru pendidikan khas termasuk kegunaan daie-daie pekak dalam menyampaikan serta memberi pendedahan berkenaan pelaksanaan solat bagi golongan OKU pekak.

Key words: orang kelainan upaya, pekak, fiqh, solat.

Content

Description of your innovation / product development / design / process.

Inovasi e-Fiqh Solat OKU ini merangkumi video bahasa isyarat yang menerangkan permasalahan fiqh solat OKU sesuai dijadikan sebagai panduan dan rujukan dalam pengajaran dan pembelajaran untuk memahami konsep dan isu dalam pelaksanaan ibadah solat OKU Pekak.

What is the context or background of the innovation / product development / design / process?

Produk ini bertujuan untuk meningkatkan kesedaran dan kefahaman masyarakat tentang ilmu Fiqh Solat OKU Pekak melalui medium interaktif ilmiah. Inovasi ini bermatlamat untuk menyediakan satu garis panduan pendidikan Fiqh Solat OKU Pekak untuk dijadikan rujukan kepada pihak berautoriti seterusnya melahirkan dai'e dan pengajar dalam bidang fiqh solat OKU Pekak.

Why are they important to education?

Konsep Interaktif- Mewujudkan konsep pengajaran dan pembelajaran fiqh solat OKU Pekak secara interaktif dan ilmiah.

Sumber Rujukan Utama- Menjadi rujukan pihak berautoriti khususnya Jabatan Mufti, Persatuan OKU Pekak dan sebagainya.

Latihan Dai'e dan Pengajar OKU- Menjadi alat bantu mengajar dan latihan.

Please write any advantages of your innovation / product development / design / process towards education and community.

Inovasi e-Fiqh Solat OKU ini dapat memperkenalkan dan memperkembangkan ilmu fiqh solat OKU Pekak di Malaysia khususnya dan di luar negara umumnya. Selain itu, ia dapat menjadi satu platform

baru sebagai alat bantu mengajar dan latihan. Inovasi ini juga dapat melahirkan cendekiawan dalam kalangan OKU Pekak yang cakna berkaitan isu-isu fiqh OKU kontemporari.

16. Please add any commercial value in terms of marketability or profitability of your innovation / product development / design / process if any.

- ✓ Produk pertama e-Fiqh Solat OKU Pekak di Malaysia
- ✓ Merangkumi aspek khas Fiqh Solat OKU Pekak
- ✓ Video Bahasa Isyarat untuk OKU Pekak

Table 1: Business Canvas

PROBLEM 1. Isu kesedaran dan kefahaman fiqh solat OKU dalam kalangan masyarakat normal umumnya dan OKU Pekak khususnya 2. Isu kaedah penyampaian dan pendidikan ilmu fiqh solat OKU Pekak. 3. Isu ketiadaan garis panduan Fiqh Solat OKU Pekak di Malaysia	SOLUTION 1. e-Fiqh Solat OKU KEY METRICS 1. Semakan Jabatan Mufti Negeri, Jakim, Persatuan-persatuan yang diiktiraf 2. Testimoni Kajian Penilaian 3. Maklumbalas dan Kaji selidik keberkesanan e-Fiqh Solat OKU 4. Pengiktirafan badan-badan berautoriti (JAKIM)	UNIQUE VALUE PROPOSITION 1. Didik Ilmiah 2. Latihan Dai' e dan Pengajar OKU 3. Sumber Rujukan Pertama	UNFAIR ADVANTAGE 1. Produk pertama e-Fiqh Solat OKU Pekak di Malaysia. 2. Aspek khas fiqh solat OKU Pekak. 3. Video Bahasa isyarat untuk OKU Pekak. CHANNELS 1. Majlis Agama Islam Negeri 2. KPM- Sekolah Pendidikan Khas 3. IPT dan Sekolah 4. Media Massa dan Media Sosial 5. Seminar, Karnival & Pameran 6. Pegawai Jabatan Kebajikan Masyarakat	CUSTOMER SEGMENTS 1. Guru dan Pelajar (IPT dan sekolah dalam dan luar negara) 2. Majlis Agama Islam Negeri 3. Jabatan Kemajuan Islam Malaysia 4. Jabatan Kebajikan Masyarakat 5. Persatuan Orang Pekak Negeri Sembilan (NESDA) 6. Malaysia Federation of Deaf (MFD) 7. Persatuan orang Pekak Islam Malaysia (PRISMA) 8. Persatuan Orang Pekak Selangor (POPS) 9. Orang Kelainan Upaya (OKU) Pekak 10. Masyarakat & Komuniti
COST STRUCTURE 50k (Modul, Ujikaji, Video Bahasa Isyarat)		REVENUE STREAMS 1. Bengkel, Seminar dan Latihan Modul 2. Jualan Buku dan Modul		

Acknowledgement (if any)

We are grateful for USIM's GOAL-ITQAN for their undivided foundation and financial supports as well as making it possible to realize this idea and innovation.

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ID NO. USIM 003
**TOPIC: E-LEARNING IN TEACHING AND LEARNING OF FIQH
AL IBADAT WAL MUNAKAHAT (LBI 1012)**

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Abstract:

The use of e-learning has been extensively promoted at the university level as a revolutionary educational platform for improved and effective teaching and learning in the millennial era. Fiqh al Ibadat wal Munakahat (LBI 1012) is among the first Islamic subjects that forms part of Universiti Sains Islam Malaysia's (USIM) cluster of compulsory undergraduate courses, which integrates and utilizes this method. The implementation of e-learning in the subject of Fiqh al Ibadat wal Munakahat is aimed at attracting and increasing students' interest and level of understanding through interactive techniques and mediums of learning that help spur their enthusiasm in the study process. The focus of this research is to identify and examine the advantages, weaknesses and future potentiality of using this tool in conducting this subject through USIM's Global Open Access Learning System (GOALS). This research will demonstrate, among others, the types of media content and activities uploaded and applied by both course instructors and enrolled students in the teaching and learning of LBI 1012, and how these impact upon the level of active engagement and contribution of students in the subject. Consequently, it is anticipated that the findings of this study will help to advance new ideas towards improving the e-learning system in GOALS, further facilitate a positive elevation in students' level of interest and desire for continuous learning of the subject, and also help to promote the application of this educational method in the teaching and learning of other Islamic subjects in USIM.

Key words: E-learning, fiqh ibadat wal munakahat, teaching method, GOALS

Content

2.0 Description

The application of e-learning using GOALS in the subject Fiqh al Ibadat wal Munakahat at USIM is an improved and innovative method of teaching and learning, which utilises educational technology and promotes virtual interaction between the instructor and enrolled students.

3.0 Background

There are five stages were involved in the development of the e-learning using GOALS for this subject, which are as follow:

1st phase : Formulation and drafting of the course outline at the faculty level

2nd Phase : Followed by the construction of the course module according to selected topics, based on the *Shafi'e* school of thought, which were then compiled into a reference book.

3rd phase : Important materials on each topic to be taught over the duration of 14 weeks before the beginning of the semester, were thereupon disseminated and uploaded via GOALS.

4th phase : Comprising teaching and learning activities, which were carried out through various multimedia and online educational tools, either during face-to-face contact and/or virtually. These included access to instructional videos, audio lectures, and submission of youtube video presentations.

5th phase : Consequently, student assessments were carried out via instruments such as forum, online quiz and online mid-term test, of which the results were automatically generated in real time.

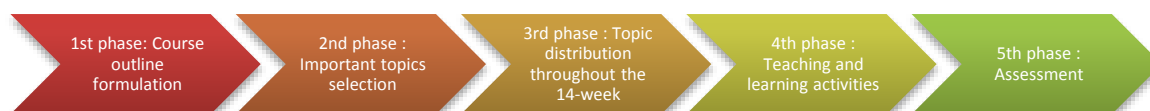


Figure: E-learning through GOALS development process

4.0 The Importance to the Education

This new medium of teaching and learning is significant as it enhances higher thinking order skills among students, which will facilitate their capability as they venture into different areas of work relating to the scope of the subject.

5.0 Advantage

Educating the millennial generation is a challenging process particularly in the advent of the Fourth Industrial Revolution, and thus there is a compelling need to bridge the gap between the instructor and students in terms of educational technology. The implementation of e-learning would not only help to



address this point, but also assist in generating a creative and stimulating teaching and learning environment, both in the real and virtual classrooms. An advantage of this system can be seen during Semester II, Academic Session 2017/2018, in which this course was offered to students from the Faculty of Quranic and Sunnah Studies. Adjustments were made to the allocation of credit hours, where lessons were to be conducted within two hours of lecture per week without any additional tutorial class, unlike previous practice. In this case, the utilization of e-learning proved to be quite crucial. Although contact hours were markedly reduced, students were able to hold discussions and frequently interact with the lecturer and among themselves through the various mediums in GOALS. At the end of the semester, students' feedback on the teaching and learning of this subject were indicated in e-Nilai, in which the instructor received an average of 89.03%. It is suggested that this new approach in teaching Fiqh al Ibadat wal Munakahat can similarly be extended and applied to other Islamic courses.

6.0 Commercial Value

Further, because this method is not confined to traditional teaching styles, and is more interactive and engaging in nature, the subject itself may be integrated as part of several relevant learning modules which are open to the public, such as Modul Bersepadu Kursus Pra-Perkahwinan Islam under Jabatan Kemajuan Islam Malaysia (JAKIM), Modul Bimbingan Asas Fardhu 'Ain for Muslim reverts under PERKIM, and Bahagian Sokongan Keluarga (BSK), Jabatan Kehakiman Syari'ah Malaysia and BSK under the Islamic Religious Departments of each State.

Acknowledgement

We are grateful for the financial support and data provided by Pusat Pembelajaran Akses Terbuka Global, Bahagian Inovasi Pembelajaran dan Pengajaran, USIM.

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ID NO. USIM004
**TOPIC: 21st Century English Language Learning
Ambiance via Blended Learning Approach (21-ELLA)**

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Abstract:

21st Century English Language Learning Ambiance (21-ELLA) introduces a revolutionised way of learning the English language through a blended learning approach. The advent of new forms of technologies have resulted in learners being drawn towards various ways of digital learning (Prensky 2001). However, the role of teachers to facilitate in-class learning is still crucial in ensuring that the maximum potential of language learning opportunities can take place accordingly. Thus, blended learning is the best approach to meet both demands in the students' and facilitators' roles, respectively. 21-ELLA offers a revolutionised language learning environment that integrates a variety of online learning components in catering to the needs of 21st century learners, while still emphasising teachers' roles as facilitators in overseeing the learning process. This learning approach is theoretically grounded on the Second Language Acquisition Model (Ellis 1994) and Bigg's 3P model of teaching and learning (2007) which enables the creation of a learning environment that is interactive, enjoyable, meaningful, and autonomous. 21-ELLA also offers a low-anxiety learning environment, which can easily capture the interest of students who are from low proficiency levels and who lack motivation as they can adapt their language learning styles to a suitable environment, without feeling inferior as learners.

Key words: 21st century learning, autonomous learning, blended approach, interactive, digital

Description

21st Century English Language Learning Ambiance (21-ELLA) is an innovative feature that aims to facilitate an improved learning environment which benefits both teachers and learners in the English language learning process.

Context /Background

This innovation aims to create a meaningful learning experience for low proficiency L2 learners, while encouraging independency in learning the language beyond the traditional modes of classroom



interactions. It also aims at providing easy-access and flexibility in language learning, which will benefit both students and teachers in the long-run.

Importance to Education

21-ELLA facilitates the use of online learning tools that cater to the needs of 21st Century learners. This enables students to collaborate better with other learners in creating a more conducive learning environment. With the concept of "bringing the world" into the classroom, 21-ELLA improvises previously used methods of language learning in creating wider options for students. It also aims to create an international experience for learners, making the space accessible to all, hence, creating a "cross-cultural study space" which extends the boundaries of traditional learning environments.

Advantages

Among the many advantages of this innovation include its ability to facilitate the learning process in providing more options, promoting autonomous modes of learning among students, offering a low-anxiety and stress-free language learning environment, as well as promoting critical thinking, independent learning and problem-solving skills---which are all 21st century skills needed by learners in this digital age. 21-ELLA also aims to provide supplementary learning materials to support face-to-face input in learning, while offering simple, easy and attractive user interface. It enables flexibility and accessibility for language learning, where students are able to fully utilise their own time, pace and learning styles. This will also promote variety in students' learning modes as it acts as an alternative learning aid in assisting students to adapt to the abstract nature of language learning. Creating such options and variety in language learning will undoubtedly benefit the education field and community, at large.

This innovation also promotes learners' critical thinking skills to discuss and investigate issues throughout their learning process in an authentic context, yet, enabling them to explore ideas beyond the walls of the classroom. Educators and learners will both be able to collaborate and share knowledge, by creating more learning opportunities, within a flexible environment.

Commercial Value/Marketability

This innovation will change the way that educators view learning environments of the future, in enabling a wide range of English language apps for low proficiency L2 learners in schools and higher institutions of learning. With English language learning as a platform, 21-ELLA can be expanded into the teaching and learning of other languages, with its technological features, adaptability, and integration. The potential to expand into English for Specific Purposes (ESP), and other types of language proficiency courses can be developed through this autonomous learning mode, as it will become a basic model that can initiate other types of independent learning.

Figure 1: Framework of Blended Learning Approach.

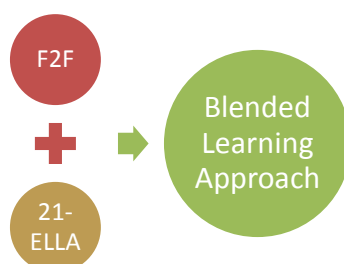
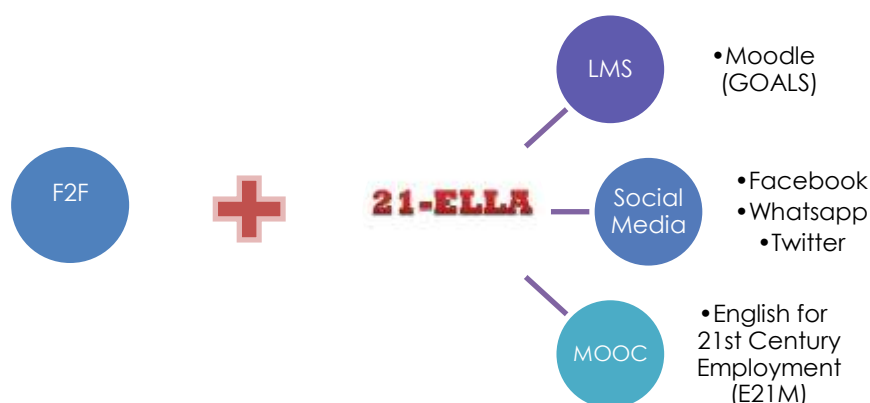


Figure 2 : Online Components of 21-ELLA



Acknowledgement

The innovators are extremely thankful for the immense and continuous support from the Centre for Global Open Access Learning Immersive Technology and Networks (GOAL ITQAN), Universiti Sains Islam Malaysia (USIM). We are very grateful in acknowledging USIM for funding this innovation project.

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ID NO. USIM005
TOPIC: ECOBOX - Raising Environmental Awareness Through Coding

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Abstract:

EcoBox is a product that introduces students to coding, as well as, raises environmental awareness through various fun and interactive nature related projects. Series of video and online tutorials will teach students how to interact with outside world. Ecobox comes with all the necessary equipment and sensors to accomplish such projects as, temperature and humidity monitoring, analyzing air pollution and haze levels, measuring soil moisture, UV radiation meter, noise pollution levels and many more. Our online platform will provide even more teaching resources for further self-development. Students and educators can benefit from our product equally. Ecobox can be used in classrooms, be part of the STEM program, or used in various science related workshops and trainings.

Key words: *coding, Arduino, IoT, MOOC, self-learning*

Content

Environmental awareness is an ideology that evokes the necessity and responsibility of humans to respect, protect, and preserve the natural world from its anthropogenic (caused by humans) afflictions. By teaching our friends and family that the physical environment is fragile and indispensable we can begin fixing the problems that threaten it. Numerous resources are available to promote environmental awareness; group learning (in or outside of class), informational and inspirational seminars, and environmental books and brochures are just a few of the tools that can get you involved in promoting the environment. However, most of these tools are found to be boring by today generation, who is more inclined towards multimedia content and digital gadgets.

USIM is proud to present a new youth friendly product – EcoBOX. The idea behind EcoBox is to teach youngsters the basic coding skills through various environmental projects. Teaching code is a great platform to interest kids in pursuing IT careers. Influential tech firms have called for programming classes in schools to ensure that future job seekers are equipped with appropriate industry skills. Many interesting and creative jobs all depend on a degree of coding ability. Coding helps children to learn thinking skills as they have to imagine coming up with a set of instructions to enable the computer to do something for them [1].

With EcoBox students will learn how to interact with outside world through series of video and online tutorials. EcoBox includes Arduino UNO board with multiple sensors, as well as, state of the art nodeMCU microcontroller board for IoT projects. Some examples of projects are given below:

- Noise pollution monitoring
- Air quality monitoring
- Water conductivity test
- Measuring temperature and humidity
- UV radiation meter
- Room temperature control using IoT
- Biosensor for body temperature and heartbeat monitoring
- Soil moisture sensor
- Fire detection



- Home security sensor
- Connecting the Arduino project with the mobile phone

One of the main advantages of our product is that it includes state of the art IoT projects, that will teach students not only to build environmental sensors but also connect them to the Internet. They will learn how to create simple mobile and web applications to control their IoT devices over the air.

There are many video tutorials available online today, but EcoBox is designed to suit secondary school teachers and students, which aligns with current government agenda and school syllabus. Computational thinking is an important element in the new primary and secondary school curriculum – Primary School Standard-based Curriculum (or KSSR) and Secondary School Standard-based Curriculum (or KSSM). Coding is currently offered to Year 6 students through the Module on Programming within the subject of Information, Communication and Technology (ICT). From 2020 onwards, coding will be taught through the Design and Technology subject to Year 4, 5 and 6 students.

Distinguished part of EcoBox is that tutorials focus on science part of the projects as well. Each tutorial is created in collaboration with USIM lecturers from various fields of study, including food biotech, applied physics, chemical technology and mathematics. Instead of simply teaching the students how to assemble certain hardware, we also explain them the science behind each project. Students will learn how does the flame sensor detects a fire, what is the UV, or how does water conductivity changes depending on its quality and many more. Students may use EcoBox sensors for entry level scientific experiment, unattended environmental monitoring, or even upload the data to an IoT server.

Currently EcoBox is the part of USIM's STREAM products portfolio, and initial surveys show great interest in our product. We believe in huge commercial potential of EcoBox, as it is the only product in the market that focuses on environmental IoT projects. With current government agenda, we believe it will have a huge success among the educators, secondary school students, young innovators, as well as, public and private educational institutions.

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ID NO. USIM 008
TOPIC: i-Tourism
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Abstract: The studies on Islamic tourism involving Malaysia Islamic tourist places still little. Thus, researchers in Universiti Sains Islam Malaysia and Kolej Universiti Islam Antarabangsa Selangor observe the necessity for constructing Need Analysis Model for Islamic Tourism so as to meet the needs of Naqli and Aqli Integration in tourism. This research was conducted using the method of distribution questionnaire to respondents in order to get their input into needs' analysis regarding Arabic for Islamic Tourism. Whereupon, the researchers analyzed the perceptions of Arab tourists about the (lacks), (necessities) and (wants) of their use of Arabic as a language of Islamic Tourism in Malaysia. Based on this study, the Islamic Tourism model will be built in the course of contributing to the development of Malaysian tourism industry.

Key words: *Islamic tourism, Need Analysis, lacks, necessities, wants*

Content



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ID NO. USIM 009
**TOPIC: IMTIHAN KAFAAH AL-LUGHAH AL-ARABIYYAH
ONLINE**

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Abstract:

IMTIHAN KAFAAH AL-LUGHAH AL-ARABIYYAH (IKLA) ONLINE or is also known as Online Arabic Language Proficiency Test. It is a novel online test platform to identify the Arabic language proficiency level of new USIM undergraduate candidate. All USIM undergraduate candidate will seat for this online exam at anytime and anywhere before they register their study in USIM. The result of this activity facilitates the process of offering and assigning Arabic courses that are appropriate according to their level of mastery. The LMS Moodle has been converted to be as the online exam tool for this purpose. The platform is known as GOALS and can be assess only by students with USIM Offer letter. The candidates must answer all 4 sections of question with the time given. Based on the results, the candidates will be assigned the suitable class to increase their Arabic language proficiency. To avoid the issue of trust and security, the students are allowed to seat for the exam once with the adequate time. Furthermore, the question and answer are shuffled to avoid the similarity if the candidates attempt the exam together. This online test involved several groups of people including the Arabic teachers to prepare the question bank, the IT people to ensure the infrastructure and the server in place and the Academic Management that manage the candidates matters. This method of assessment has improved the management of Arabic language class which was manually conducted. It has reduced the cost and time need to conduct this mass exam every new intake every year. It has been conducted since 2016 and has been successful method for USIM.

Key words: *proficiency test, Arabic language, online test, e-learning, assessment tool*

Introduction

It is an online exam platform using Moodle. The platform is designed and converted to be as exam tool. Many groups of expertise involved for example: the Arabic teachers to prepare the question bank, the IT people to ensure the infrastructure and the server in place and the Academic Management that manage the candidates matters.

Background

Previously the Arabic language proficiency test were conducted in hall or classes after the new students registered in USIM. This process is very meticulous, and costly. Furthermore, it takes longer time to manage the exam thus delay the classes to start. The idea to make the proficiency test online has given the students more flexibility and help the administer to do earlier preparation in managing classes and Arabic teachers where by using online test, marking was generated automatically. Figure 1 and 2 below shows the process flow of IKLA Online as well data gathered through the year from 2016 – 2018 as an evidence of this project have been run successfully.

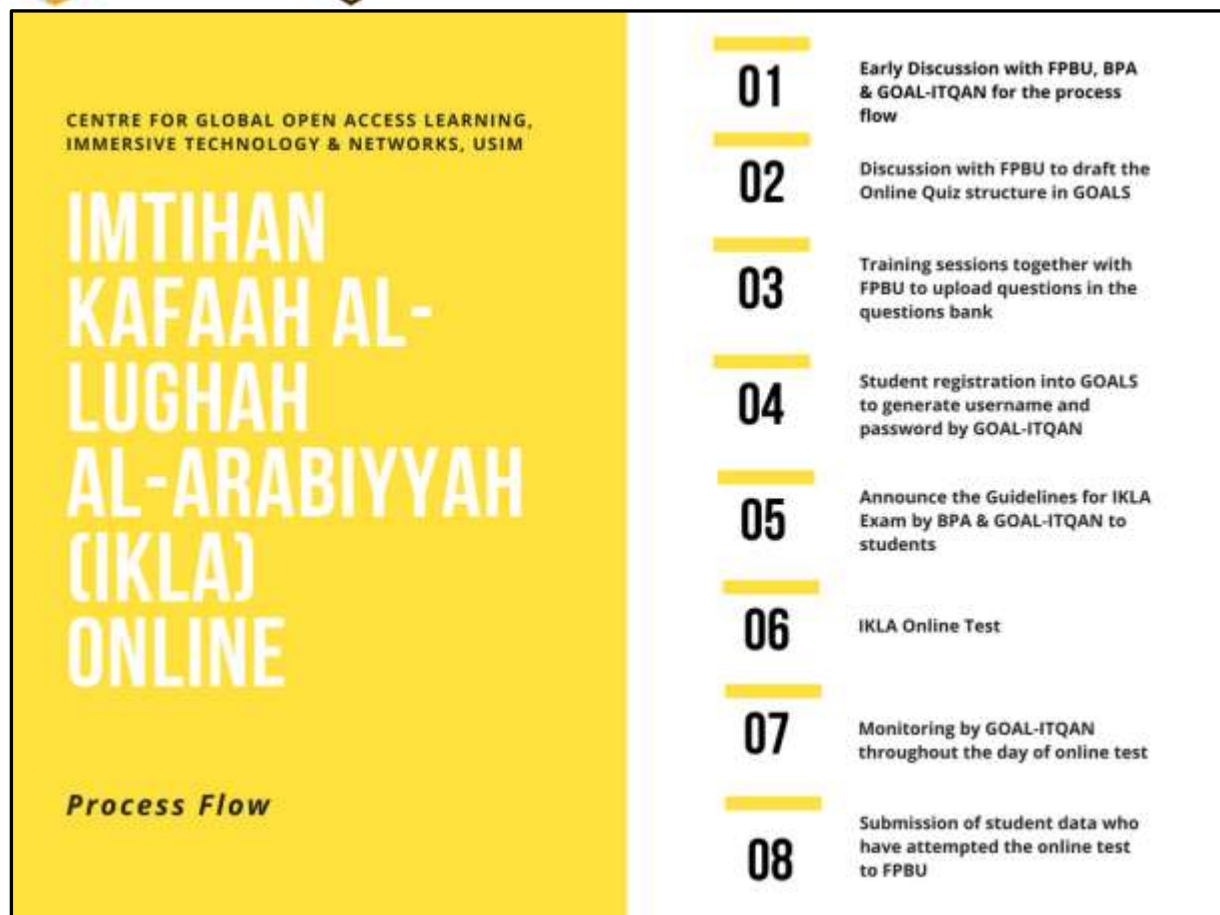


Figure 1: IKLA Online Process Flow

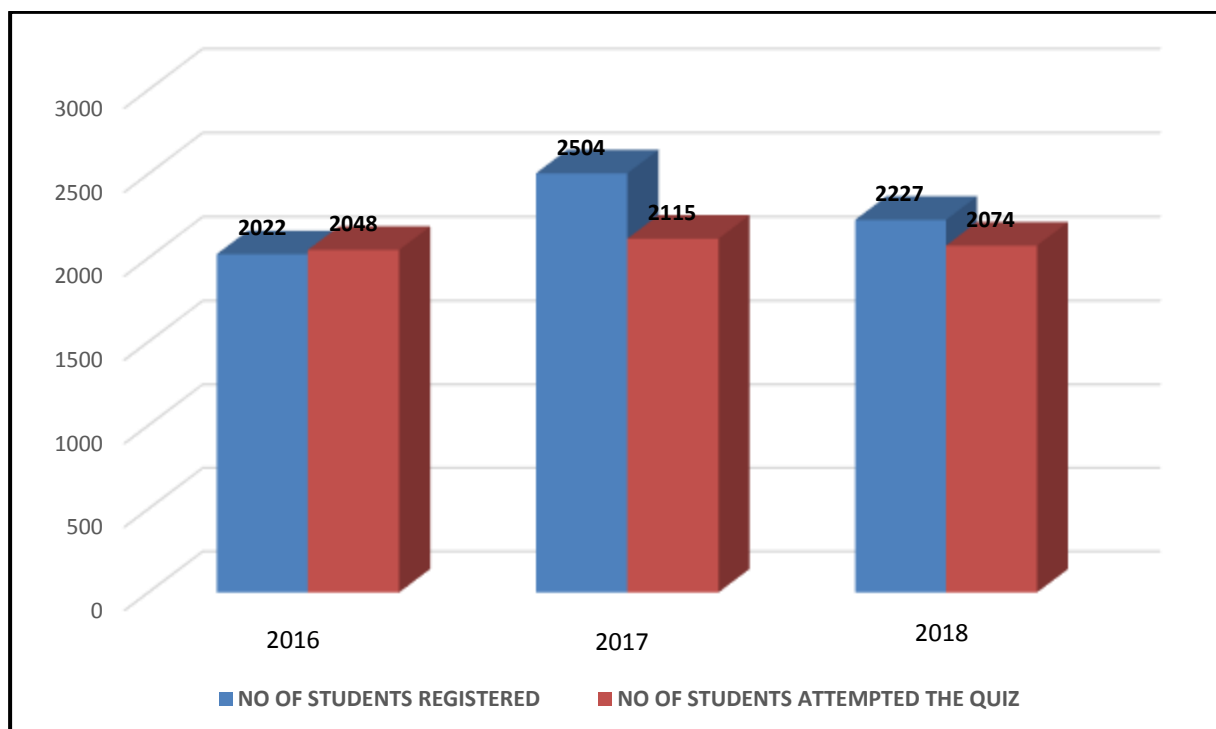


Figure 2: Data of students who have attempted the online test

امتحان كفاءة اللغة العربية (IKLA)



Manual Pengguna

Struktur Soalan

SILA PASTIKAN SEMUA SOALAN DALAM SETIAP SEKSYEN DIJAWAB DALAM TEMPOH BERIKUT:
 please make sure all questions in every section are answered in the following period:

1. SECTION A (20 SOALAN) - 60 MINIT
 SECTION A (20 QUESTIONS) - 60 MINUTES
2. SECTION B (10 SOALAN) - 20 MINIT
 SECTION B (10 QUESTIONS) - 20 MINUTES
3. SECTION C (10 SOALAN) - 20 MINIT
 SECTION C (10 QUESTIONS) - 20 MINUTES
4. SECTION D (10 SOALAN) - 20 MINIT
 SECTION D (10 QUESTIONS) - 20 MINUTES

Arahan Soalan

KESELURUHAN MASA DIPERUNTUKKAN 2 JAM SAHAJA DAN SEKALI PERCUBAAN (ATTEMPT) SAHAJA YANG DIBENARKAN. ANDA JUGA TIDAK DIBENARKAN KELUAR DARIPADA "BROWSER", SEHINGGA SELESAI MENJAWAB SEMUA SOALAN, BAGI MENELAKKAN PERCUBAAN (ATTEMPT) ANDA TAMAT.

Overall time allowed for this Online Test is only 2 hours and students are allowed to answer once upon login to the system. Students also are prohibited to leave the browser to avoid your attempt end

Komponen Soalan

SILA KLIK IMEJ DI BAWAH UNTUK MULA MENJAWAB SOALAN DAN PASTIKAN BUTANG "submit all and finish" DITEKAN SETELAH SELESAI MENJAWAB SEMUA SOALAN PADA SETIAP SECTION

Please click the image below to start answer the questions and make sure that "Submit all and finish" is pressed after completing all questions in every section

Online test components



Pelajar tidak perlu untuk mencetak keputusan ujian anda selepas selesai menjawab. Markah keseluruhan akan diberikan oleh pihak Fakulti

Students does not have to print your test result after completed answering. The overall score will be provided by the Faculty

Figure 3: Screenshot of IKLA Online Test page

إنَّ حليَّة طالب العلم ورأس ماله الحقيقيّ : الأدب والأخلاق ؛ فهي المكسب الحقيقي لطالب العلم :

لا تُحَسِّنُ العلم ينفع وحده ما لم يُتَّخَذْ رُتْبَةً بِخِلَاق

ولأجل هذا كان السلف الصالح -رضي الله عنهم- يحرصون على الأدب قبل العلم، فإذا أرسلوا أولادهم إلى أهل العلم ليأخذوا من علمهم، أمرهم قبل العلم أن يتأدّبوا بأدبهم وهدبهم، وكانوا إذا أرسلوهم للمربين والمؤدّبين أمرهم بالأدب قبل العلم، وكانت وظيفة (مؤدّب أولاد الخلفاء) من الوظائف المعروفة، والمشهورة، ولا ريب في ذلك، فقد ثبت عند أحمد والحاكم بسندٍ حسنٍ أنَّ النبي صلى الله عليه وسلم قال: (ليس منّا من لم يُؤدّب كبيرنا ، ويرحم صغيرنا ، ويعرف لعائلنا حقّه). وما ذاك إلا لإدراكهم أهميّة الأدب ، ومكانته من الدين والعلم .

قال البوشنجي - رحمه الله - : (من أراد العلم والفقه بغير أدب، فقد اقتحم أن يكذب على الله ورسوله). وقال الخطيب البغدادي - رحمه الله - : (والواجب أن يكون طلبة الحديث أكمل الناس أدباً، وأشد الخلق تواضعاً، وأعظمهم نزاهةً وتديُّناً، وأقلهم طيشاً وغضباً، لدوام قرع أسماعهم بالأخبار المشتملة على محاسن أخلاق رسول الله صلى الله عليه وسلم، وآدابه، وسيرة السلف الأخيار من أهل بيته وأصحابه، وطرائق الأحداث، ومآثر الماضين، فيأخذوا بأجملها وأحسنها، ويصدفوا عن أردأها وأدومها).

وعن ابن وهب قال: سمعت مالكا يقول : (إنَّ حقاً على من طلب العلم أن يكون له وقارٌ وسكينة وخشية، وأن يكون مُتَّبِعاً لأثر من مضى قبله). وقال سفيان الثوري - رحمه الله - : (كان الرجل إذا أراد أن يكتب الحديث تأدّب ، وتعبّد قبل ذلك بعشرين سنة).

بل كانوا يفتشون في أخلاق وأحوال من يتعلّمون منه قبل التلقّي عنه، قال إبراهيم النخعي - رحمه الله - : (كانوا إذا أتوا الرجل ليأخذوا عنه ، نظروا إلى سمته وإلى صلاته ، وإلى حاله ، ثم يأخذون عنه) . وقال إبراهيم بن حبيب بن الشهيد: قال لي أبي : (يا بنيّ إنَّتَ الفقهاء والعلماء، وتعلّم منهم، وخذ من أدبهم وأخلاقهم وهدبهم، فإنّ ذاك أحبّ إليّ لك من كثير من الحديث). وقال الإمام مالك: (كانت أُمّي تُعَمِّمي، وتقول لي: اذهب إلى ربيعة، فتعلّم من أدبه قبل علمه). وأخبارهم وآثارهم تطول، يظهر منها أهميّة الأدب، ومبلغ اهتمام السلف به، وإدراكهم لمكانته من العلم والدين.

ما المكسب الحقيقي لطالب العلم؟

Select one:

☐ a.

العلم والهدي

☐ b.

الأدب والعلم

☐ c.

العلم والأخلاق

☐ d.

الأدب والأخلاق

Figure 4: Screenshot of IKLA Online Test question

The setup of back-end for online exam platform USIM.

There are many reasons for the success of Online Arabic Language Proficiency Test, but there are some key technical advantages that lead to their success. Infrastructure services have many fundamental benefits of the following:

- **Access anywhere, anytime:** the infrastructure is ubiquitous, including access from home, work, airports, cafes, class room, tablet and smart phones.
- **Available via portable or low-cost devices:** infrastructure services support a wide range of devices such as set-top boxes, network computers, and smart phones.
- **Enables groupware:** Because the data for many users is centralized, we can easily offer group-based applications such as group calendars, chat, messaging and teleconferencing.
- **Much cheaper overall cost:** Although hard to measure, infrastructure services have a fundamental advantage in cost over designs based on architecture functionality. With the template based scalable system. GOALS can be easily increase the processing power to their application pool after system produced after this project. And this project also aims to increase 480% of improvement in web access capacity for anything moved from the device to the infrastructure. In general, the key is that infrastructure resources can be multiplexed well across the active users. The centralization of administrative burden also reduces overall cost, but it is much harder to quantify.
- **Convergence with other infrastructure services:** The IP infrastructure is subtly growing to include the voice network, video distribution, and course content. This "convergence" enables many new capabilities such as integrated authentication for better reporting; location-based services – such as student access location from around the globe; and sophisticated teleconferencing that includes handouts and PowerPoint slides in addition to audio and video.
- **Can upgrade/add services in place:** Perhaps the most powerful advantage in the long term is the ability to upgrade services or offer new services easily. Traditional applications and devices require physical distribution that is expensive and awkward. With infrastructure services, devices last longer and grow in usefulness over time.

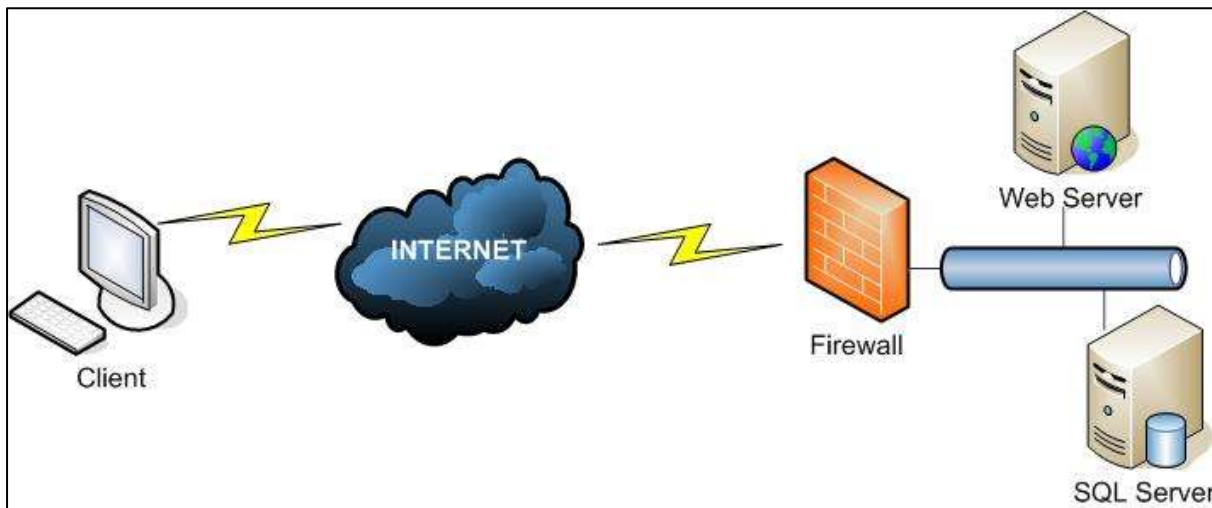


Figure 5: Environment of IKLA Online Setup

Advantages

The platform suits the 21st century trends and learners demand. It is aligned with the Education 4.0 concept. Besides that, it also gives advantages to the university: save time, paperless environment and reduce cost for setting up exam or test where there is no need to hire more instructor that will be paid to



conduct the test. The candidates can take their online test at home, using their own devices. Therefore, students will know their current level of Arabic proficiency upon entering the class in the university.

Commercial value

This method of examination can be commercial because there is demand in the market for Arabic online examination. English language exam online already available in the market, so it is the time to have for Arabic as well. Majlis Peperiksaan Malaysia has shown interest to embark the similar process.

Acknowledgement

We would like to express our deepest appreciation to Faculty of Major Languages Studies (FPBU), Centre for Global Open Access Learning, Immersive Technology & Quality Assurance (GOAL-ITQAN), Division of Academic Management (BPA) as well as Deputy Vice-Chancellor Office who cooperated well in ensuring this Proficiency Test work smoothly. Special thanks also go to Moodle as an open source Learning Management System (LMS) that provides custom assessment tool for new undergraduate students in this project.


ID NO. USIM 010
TOPIC: BIPP AUGMENTED REALITY (BIPPAR)

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Abstract: A creative application using Augmented Reality (AR) is developed to enhance the services competency of a department that manages the learning and teaching innovation in USIM. This department is known as Bahagian Inovasi Pembelajaran dan Pengajaran (BIPP). BIPP augmented reality (BIPPAR) application allows lecturers and administrative staffs to access the information and trainings offered. Using this handy application, variety of useful information related to learning and teaching can be easily discovered and disseminated in university. Among information in this application are list of programs offered in the system, staff directory, shortcut log in to teaching and learning platform, get to know how to score at least 30% blended learning, get the real time information of training calendar, booking the preferred training, browse collection of educational materials and watch recorded video training. BIPPAR is developed using Blippbuilder and Javascript interface. The prototype has been tested and will be improve with the new future identified components such as analytic data and virtual learning/gaming elements.

Key words: *Augmented Reality, teaching, learning, Innovation, services, blended learning.*

Introduction

Augmented Reality (AR) application is an innovative technology of 4.0 that creates an interaction between the real world and virtual data such as text, objects and images. The emerging of the technology has improved the accessibility information and would enhance the services competency of any service provider. BIPP augmented reality (BIPPAR) is developed to improve the dissemination of knowledge related to learning and teaching services offered by Bahagian Inovasi Pembelajaran dan Pengajaran (BIPP) in USIM. The dissemination of learning and teaching via augmented reality applications will allow people to access the content of services easily which is by scanning images using both Android and IOS mobile device. In fact, this delivery method for learning and teaching services will be more easy, interactive and more practical.

Objectives

There are four objectives in developing this product :

1. To highlight the services of Learning and Teaching Centre.
2. To promote the Learning and Teaching services.
3. To disseminate information about learning and teaching tools such as web 2.0 and SWIVL.
4. To allow the training reservation on learning and teaching in USIM.

Content



There are eight types of learning and teaching services to be highlighted such as GOALS system, USIMOE system, GACE system, MOOC, Training Offered, Content Development, Open Educational Resources (OER) system and USIM iTunes U.

Methodology of Development

There are methods of development in BIPPAR project separated by phases. Each phase is essential to build the project such as Planning Phase, Design, Implementation Phase, Testing and Deployment Phase. First step is planning phase, followed by design, implementation, testing and then deployment phase.

1. Planning Phase

This phase is start with what services to be highlighted in BIPPAR project. There are eight services such as GOALS, Training, Usimoe, GACE, USIMMOOC, Content Development, OER and iTunes U.

2. Design & implementation Phase

Design phase is start in BlippBuilder which is a tool to create AR activities and to dump all the contents of this project. The content can be in images, website links, audios and videos.

The Implementation phase will happen in BlippAR which is the Augmented Reality apps that enable the function of scanning the logo in the BIPPAR project.

3. Testing & Deployment Phase

BIPPAR project can be tested using any mobile devices that used both Android and IOS platform. User can scan each logo of the BIPPAR using any devices such as Tablet, Smartphone and IPAD.

Acknowledgement

Teaching and learning services can be reached by USIM Staffs, students and other people as well. To deliver and highlight the services of BIPP to people in USIM, the 4.0 application such as Augmented Reality (AR) is needed.

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ID NO. : USIM 011
TOPIC : Flex Ed@USIM

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1.0 Abstract

The Flexible Education (Flex Ed) has enabled the process of education and training to be expanded in an online virtual college mode, enabling students to use the state-of-the-art, and multimedia, e-learning techniques (Yaacob, 2011). The recent Flex Ed had merged into a different level where it offers an expanding range of exciting new formats for Information and Communication Technologies (ICT) and website design courses. Besides, students nowadays may access the billions of information and references electronically and communicate with their peers through internet.

Malaysian higher education has been facing fundamental changes triggered by the effects of globalization, and the speed of changes in the growth of communication technologies (Chooi, 2008). Thus, USIM is currently among Malaysian higher education institutions that have embarked on a Flex Ed initiative. USIM's Flex Ed is offered as courses that serve full university programmes. Additionally, USIM also aims to give its faculty members the opportunity to explore new delivery methods through the use of technology, thus also creating an opportunity for the institution to enhance and improve its programmes. Through the usage of ICT in this programme, learning can become more active rather than passive, more conversational opposed to publication (Anantha, 2012).

USIM's experienced in instructional design for distance and blended learning provided grounding for designing well-structured. Careful articulation of learning goals, well designed course activities, and structured course modules are especially important to meet the needs of diverse range of learners who have different motivations, expectations, and learning styles. Peer to peer support is also an important aspect of USIM Flex Ed and can be scaffold through learner engagement and community building strategies. Flex Ed courses are credit-based, grades are an important motivating factor for many learners. We also notice that USIM Flex Ed instructors are interested in reaching a larger audience on important topics. Additionally, the instructors are deeply engaged in the pedagogical process of teaching. The opportunity to expose their subject knowledge and expertise, as well as their teaching ability and practices to a greater audience is a motivating factor for instructors.

Key words: *Flex Ed, Blended Learning, ICT, and Distance Learning.*

2.0 Description

Flex Ed courses in USIM are open access. Course design for Flex Ed was primarily the responsibility of the instructors that took place in a context of course and support teams with a variety of roles and expertise. The Centre for Global Open Access Learning, Immersive Technology and Networks (GOAL-ITQAN) is an e-learning centre of USIM that provides instructional design and project management support, media development support, and in-depth production and delivery assistance.

Flex Ed format is based on six areas of student engagement:

a. Video lectures

These are, at their most basic, recorded asynchronous sessions of lead academic discussion topics related to their subjects. The application were used is Skype for Business, a wide array of presentation styles can be used, from talking heads to interviews and picture in picture (for example, when slides



are being used). The video recording session can be done whether in USIM compound or outdoor places as requested by the subject instructors.

b. Reading materials

A group of lecturers appointed to teach certain subject were appointed. One of their significant tasks is to create a module for the specific subject and distribute it to the students. The module will be printed out (With ISSN Code) to be distributed among students. Besides, the modules will also be uploaded online into the USIMOE website.

c. Activities

A range of formative activities are offered, with the aim of allowing students to further test their knowledge. These activities are part of Flex Ed formal assessment with the attempts to help provide a deeper understanding of the concepts. Video feedback for some of these activities was provided.

d. Forums

USIM's Flex Ed forums are the main method of student interaction with content. Forums are typically split into a number of threads, including, but are not restricted to; general discussion, subject specific discussion, course feedback and technical feedback. Instructors can actively participate in these forums or choose to have teaching assistants respond to students, responding to questions when needed.

e. Social media

In order to allow as much student participation as possible, chats via Whatsapp apps were used concurrent with USIMOE. Questions relating to previous weeks' study were discussed, which is not academically moderated inclined and monitored by the course team. For students who are unable to access the session, the session's video, questions and answers are posted on the USIMOE for their reference. Students were also encouraged to continue their discussions on other dedicated pages, on other social media platforms, such as Facebook and Google+.

f. Assessment

Assessment can be based on automatically-graded multiple choice questions, either as part of video lectures (in-video quizzes) or taken separately. In addition to multiple choice questions (MCQs), course teams could also choose to use auto-graded programming assignments or peer review assessment. Peer review can be used for more open-ended assessment formats and requires students to mark one another's work based on a defined rubric set by the instructor.

3.0 Background

The first group of students for Flex Ed programmes which offered came from all over Malaysia. It is interesting to note that the response from the participants has been encouraging despite the fact that one of the programmes is a new Islamic studies programme offered in USIM and we are keep receiving a number of new registrations from day to day. The program has run smoothly and the rates of student's response have continuously been encouraging. Through the usage of ICT in this programme, learning can become more active rather than passive, more conversational opposed to publication (Anantha, 2012).

A blended learning approach was adopted combining online and in-class activities, moving away from passive lectures to more active learning, which results in better learning outcomes. Nonetheless, the approach to instructional formats and pedagogies was relatively conventional. Lessons are delivered via video lectures, PDF or Power Point slides. Learners are assessed through various course activities such as forums, discussions, quizzes and practices. Further, the lessons are structured around repurposed learning materials that have already been developed for full-fledged courses. Learning materials, for instance, USIM Open Education (USIMOE) website, Skype videos, and Power Points slides are included in each course.

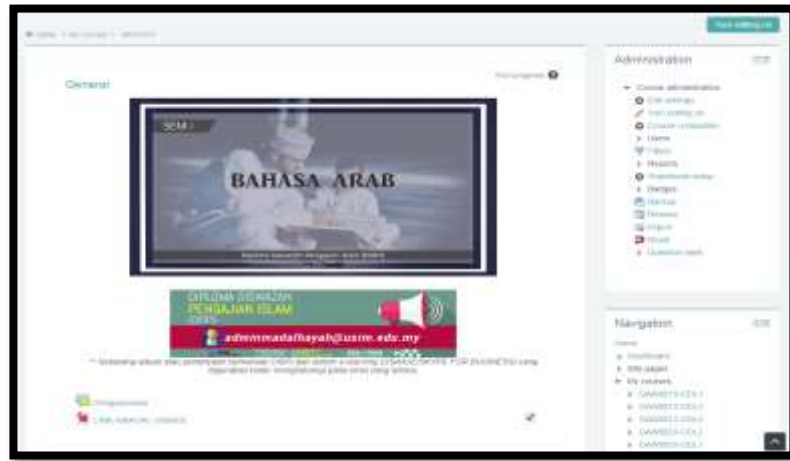


Figure 1: Arabic Course



Figure 2: Skype Session on Arabic Course



Figure 3: Lecture Notes on Arabic Course

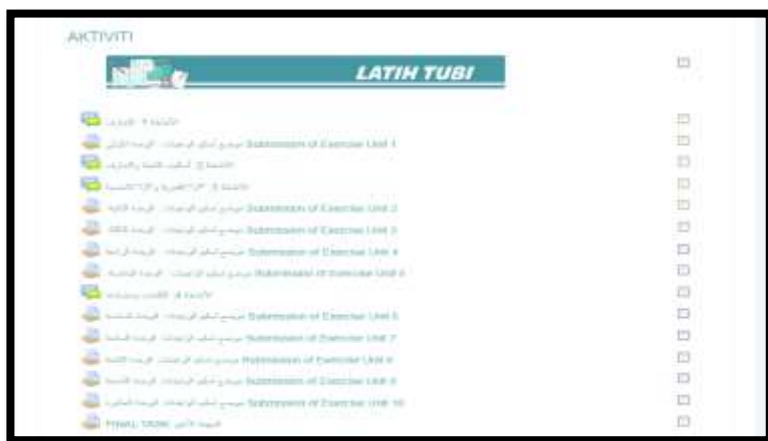


Figure 4: Assignments on Arabic Course

4.0 The importance of USIM's Flex Ed

There are many significant of the Flex Ed to the development of education in Malaysia. The (Flex Ed) has enabled the process of education and training to be expanded in an online virtual college mode, enabling students to use the state-of-the-art, and multimedia, e-learning techniques. USIM also aims to give its faculty members the opportunity to explore new delivery methods through the use of technology, thus also creating an opportunity for the institution to enhance and improve its programmes.

Flex Ed in USIM is a flexible supported distance learning which incorporate a variety of teaching and learning methods such as distance learning, seminar, video conferences, lectures and email. A blended learning approach was adopted combining online and in-class activities, moving away from passive lectures to more active learning, which results in better learning outcomes. Nonetheless, the approach to instructional formats and pedagogies was relatively conventional. Lessons are delivered via video lectures, PDF or Power Point slides. Learners are assessed through various course activities such as forums, discussions, quizzes and practices.

USIM's Flex Ed is a credit offering that may be taken by large numbers of learners from around the world. USIM participation in Malaysia's FLEX ED development represented an opportunity for exploring a rapidly evolving online teaching and learning space and bring the lessons learned into our on-campus and online courses.

5.0 Advantages of USIM's Flex Ed

Course Design

Flex Ed courses in USIM are open access. Course design for Flex Ed was primarily the responsibility of the instructors that took place in a context of course and support teams with a variety of roles and expertise. The Centre for Global Open Access Learning, Immersive Technology and Networks (GOAL-ITQAN) is an e-learning centre of USIM that provides instructional design and project management support, media development support, and in-depth production and delivery assistance.

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f. Assessment

Assessment can be based on automatically-graded multiple choice questions, either as part of video lectures (in-video quizzes) or taken separately. In addition to multiple choice questions (MCQs), course teams could also choose to use auto-graded programming assignments or peer review assessment. Peer review can be used for more open-ended assessment formats and requires students to mark one another's work based on a defined rubric set by the instructor.

Media Production

Although they were not the only format of learning material, video resources did constitute a major component of pilot courses. Each of the courses developed different models for their media production. Table 2 provides an overview of different media development strategies employed by individual courses in Flex Ed.

Table 2: Media Production Strategies

Type	Description
Live Video Steaming	Authors work with a video director/producer for live streaming; studio post production team provide the required facilities and record the lecture at a stipulated time for all subjects.
Light Studio Production Model	Instructor filmed lectures in front of a screen, slides captured through tablet. Slide and instructor will be checked in post-production. No graphics or animations; post-production editing is minimal.



Strategies for creating and implementing these materials are similar across the courses, depending upon instructors and appointed staffs to completely manage this process while others rely upon USIM GOAL-ITQAN instructional design and programming support staff. For example, the Flex Ed instructors developed the content module pages and quizzes in Word-documents and Power Point format, which are then uploaded into USIMOE. After materials are implemented in the course shell, tests are carried out.

Course Delivery

The program required 2 years to complete the course materials. Thus the course teams continue to be in a development phase during the delivery of the courses, providing a "just-in-time" approach to the course development, production, and delivery. During the delivery of the courses, the instructors and GOAL-ITQAN support staff are involved in the following activities:

- a) Monitoring course forms.
- b) Hosting live weekly "weekend" using Skype for Business.
- c) Responding to students' questions and comments in forums and Whatsapp apps.
- d) Revising and refining course materials based on student feedback.
- e) Troubleshooting course materials issues as reported by learners.
- f) Facilitating platform and technical issues to Open Learning staff.
- g) Ongoing production and implementing upcoming course modules.

The academicians (author) and GOAL-ITQAN staffs are a crucial component in all courses. The academic staff of USIM, under the direction of the instructors will support the teaching of these courses by developing course materials, directly assisting learners, troubleshooting platform settings, performing Question and Answer testing, and many other activities.

The scope of the USIMOE allows one-to-one interaction between instructors and learners; almost all course interactions happened in the course's forums. One of the major activities that the academics use is forum monitoring. Across these courses, the academic staffs are subject expertise and are generally encouraged to respond directly to learners in the Skype for Business, forums, and Whatsapp apps.

6.0 Commercial Value of USIM's Flex Ed.

The affordable study fees is one of the main factor on why the Flex Ed programmes in USIM should be selected by the future students. For instance, USIM offered an Islamic programme which is, Diploma Siswazah Pengajian Islam (DiSPI). This programme offered the combination of Islamic law, leadership, Quranic and Sunnah studies for students to develop their knowledge on islam.

The Flex Ed in USIM also using the asynchronous concept with self-instructed module and video lesson which prepared by the experts. Besides, the lessons were delivered via online medium such as online quizzes, online assignment, and forum. These give USIM's Flex Ed the advantages to persuade more future students to enroll into USIM's programmes.

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ID NO. USM 002

TOPIC: A Customized Flipped Classroom with the Perfect Match of the Use of “Mentimeter” as Collaborative Activity

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Abstract: The adaptation of eLearning in the context of Malaysia is slow [1]. Often, reluctances are detected among students and lecturers. Complaints from students were identified as TIME constraint whereas from the lecturer were doubtfulness of the effectiveness of this approach [2]. This product was designed to solve both aspects from the students and lecturers. We customized a flipped classroom (FC) structure suited for local students. A Pre-recorded learning material with narration, voice and subtitles were prepared. Collaborative activities were performed using Mentimeter. Effect of the intervention was assessed using quiz as well as retrospective investigation. It was found that there is a significant improvement of student's mark before and after intervention on the same badge of students. This result was further supported by our retrospective study. Significant differences were detected using student's T-Test by comparing the result of past cohort without this intervention, $p=0.034 < 0.05$. Overall, the customised flipped classroom model has not only enhanced educators' capabilities in teaching processes but also prove to be a positive learning experience for students in pharmacy course. As the classroom continues to modernize, pedagogical such as the flipped classroom should be considered for pharmaceutical subjects.

Key words: *Mentimeter, flipped classroom, higher education.*

Content

This innovation is related to the design of class content and process of implementation. Flipped classroom concept was adopted in teaching of pharmacy courses. The flipped content was developed using a friendly software i.e. power point version 2013 with narration, sounds and subtitles. The design of class delivery was amended based on total student learning time which include guided learning, self-learning and evaluations. The assigned lecture hours were freed for guided learning via pre-recorded flipped content. Students were given a link to post their questions / enquiries arise from the prepared flipped content. As such, the instructor can prepare the enquiry well in advance before the class activity. This will not only improve the quality of information delivery but it also captured students immediate response while information receiving at home.

In class, questions related to the flipped content was cleared before collaborative activities. Activities such as quiz, open ended question or even survey responses were included as collaborative activities during classroom time. These activities were implemented using Mentimeter, a free software which is easily accessible online (Figure 1).

Grounded in insight, foresight and current trends, these design methods help remove our present threats and encourage the students and lecturer to openly embrace the technologies integration in teaching and learning. This can be evident from the participation of the students in the “Mentimeter”. The participation has not only encourage student to ask out of curiosity, but also engage them in the collaborative activity via Q&A (example in Figure 1 show multiple choice). The positives responses we have received from the students have made us realized the limited popularity of technologies integration in learning process among university students lied in the “how” but not the “what”. How do we effectively design the process of knowledge delivery is crucial but not “what” has been used to delivered the knowledge as important.

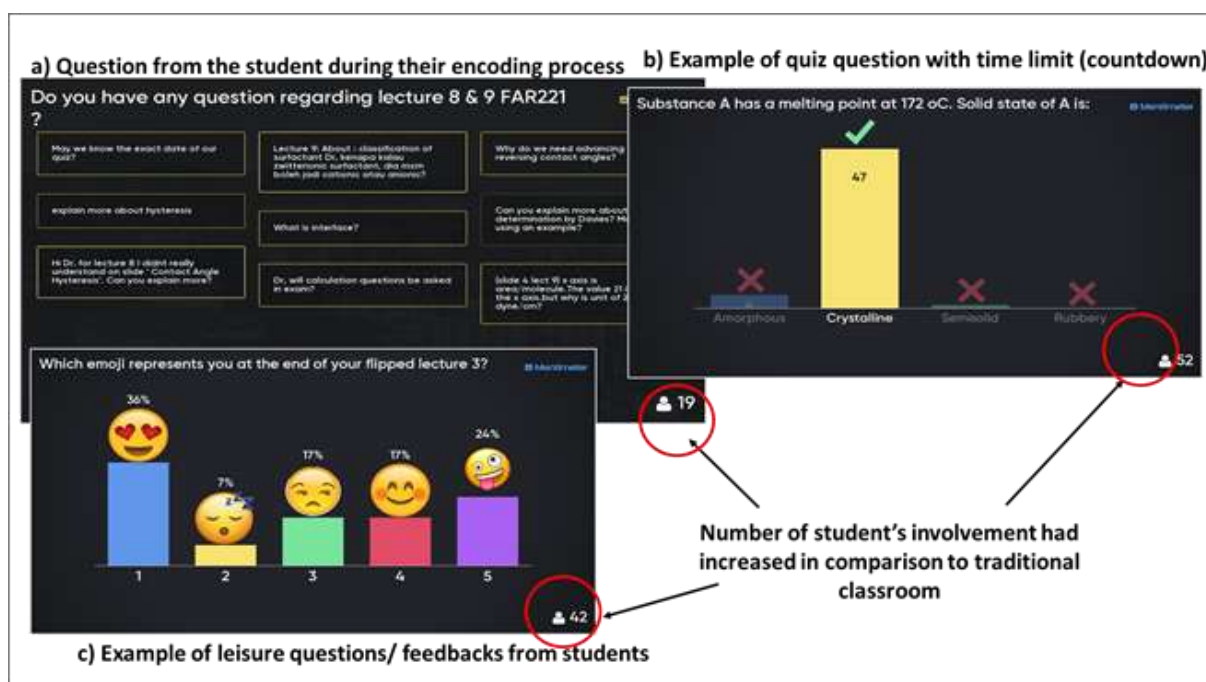


Figure 1: example of slides from Mentimeter a) students posted their questions while viewing the flipped content at home, b) Q&A session from lecturer, c) example of feedbacks from students.

A survey to the preference among the students were carried out. Majority of the students preferred to the design and process of knowledge delivery using the suggested designed of flipped classroom. Interventional study with test mark was also performed. It was found that there was a significant improvement of student's result before and after intervention. Independent group study was also performed by comparing the outcome result via essay question from different cohorts of students. It was found that student's with flipped classroom performed significantly better than students from cohort of traditional classroom. Therefore, here we show the advantages of this improved framework. To summarize, the overall advantages of this innovation is cost-effective, free, user friendly, and most importantly the better academic performances.

Acknowledgement (if any)

Authors would like to acknowledge the permission granted from school of pharmaceutical sciences in conducting the research related to this product. Besides, the contribution of Mr Nafiu Aminu in data collection is highly appreciated. Please address as many of the following sections as possible in your paper, as relevant.

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- [2] Siok-Yee Chan, Muslihah Mohamed Nadzri, The Feasibility of Using Flipped Classroom in Pharmacy Education (submitted)

ID NO. USM 003
**TOPIC: Pokémon game for conceptual learning of
parenteral formulations among pharmacy students**
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Abstract: Dosage Form II (sterile preparations) is one of the core modules for second-year pharmacy students in the School of Pharmaceutical Sciences, Universiti Sains Malaysia (USM). An average of approximately 15-20% of pharmacy students failed to pass the module every year. This phenomenon is extremely worrying and flipped classroom (FC) was proposed to enhance students' learning behaviour in this module. In order to engage them fully in the class, active learning activity with a familiar theme to them is necessary. Thus, our study investigates the effectiveness of FC which incorporates Pokémon-based analogical learning on students' learning attitude and performance in the exam. The students' performance was evaluated and compared using similar exam questions repeated from the previous year where the traditional classroom was applied. A voluntary online survey was conducted to obtain students' perception of this approach. The performance of students in the FC which incorporates Pokémon-based analogical learning activity indicates a significant improvement with 10-40% marks higher than that of their peers in the control group. This study revealed that more than half of the students believed that FC could help and benefit them in learning about the selected topic. They not only think that FC could assist them in learning but also agreed that they could work at their own pace. Students provided a positive feedback on Pokémon based analogical learning approach. They are not only finding this approach interesting and engaging but also helping them in understanding and recalling the topic better. In conclusion, analogical teaching approach in FC using Pokémon as analogue has shown to be effective and beneficial to the students.

Key words: Pharmacy; Pokémon; flipped classroom; analogical teaching

Content

In flipped classroom (FC), face-to-face session in the class is extremely important to encourage strong interaction between educator and students. Therefore, an active learning environment with a familiar theme to the students is needed. This aims also to engage students' attention in the class in a fun way.

Recent popularisation of Pokémon game has inspired us to incorporate it into our teaching and learning activity of FC. The game features a Pokémon trainer & his fictional creature or Pokémon, Charmander (evolved later to Charmeleon & Charizard) on a journey to challenge other Pokémon to gain merits. Various Pokémon corresponded to the different problems involved in formulating parenteral products was applied. These problems were created based on the essential components in assessing quality of parenteral products such as sterility, tonicity, solubility, preservation, clarity, stability & free from particulate & pyrogen.

Pokémon was carefully selected to match the characteristics of the Pokémon to the problem in formulation. For example, 'Caterpie' (caterpillar-like, Grass type Pokémon) was used to represent potential microbes growing from microbial spores – 'Metapod' (pupae-like Pokémon) in a preparation (Figure 1). Students should react to 'kill' the 'Caterpie' with a preservative which is an essential ingredient in multi-dose preparation. Another example given is the use of Water type Pokémon likes Squirtle (turtle like Pokémon) to represent the solubility problem faced in formulating parenteral products with poorly

soluble active ingredients (Figure 1). Students should react to add co-solvent to help in solubilising the active ingredients.



Figure 1 Pokémon selected for the related problems in preparation of parenteral formulations

This approach has received a high positive response from the intervention group and it has also contributed to the improvement of performance in the exam. Majority of the students found this analogical teaching is familiar to them and they can learn in a stress-free & fun-filled environment. More importantly, this helps the students to retain the knowledge acquired in the long-term memory. We believe this approach can be adapted to other topics & subjects, especially those previously dismally performed. This could help more students to love STEM (Science, Technology, Engineering, and Mathematics) as the number of students choosing this stream is plummeting in Malaysia. This approach has the potential to be patented as a game-themed interactive activity.

Acknowledgement (if any)

The authors acknowledge that the pharmacy students voluntarily participated in this study. Also, we would like to put on record our sincerest appreciation for the sponsorship of Centre for Development of Academic Excellence and Student Development (CDAE), Universiti Sains Malaysia in participating IUCEL 2018.

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ID NO. USM004**TOPIC: A Hybrid Student Evaluation through Technology
Integration: Peer Assessment****Thaigarajan Parumasivam**

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sychan@usm.my**Abstract**

Soft skills such as communication, teamwork and leadership are among the most crucial program outcomes (PO4, PO5 and PO9) required by Malaysia Qualification Agency. However, individual assessment is seen as unfeasible and non-practical in the university settings due to larger classroom size of more than 50 students. The individual assessment by the lecturer indeed may not reflect the "true performance" of the students due to the laborious and time-consuming procedure. With the integration of technology, the individual evaluation may become feasible and represent the "true" evaluation especially when the peers perform it. The current retrospective study aims to investigate the feasibility of integrating peer assessment as a component of student evaluation in achieving program learning outcome in two undergraduate pharmaceutical subjects, i.e. personal care and biopharmaceuticals. The students were asked to work in a group to produce a cosmetic product or solve a biopharmaceuticals related case study, respectively. Each student was then requested to evaluate their group members. The evaluation rubrics were consisting of Likert scale and open-ended questions in a Google form. The components of evaluation include punctuality, the use of common language, the preference to work together, contribution, the possibility of future collaboration and cooperation. Parallely, the lecturer evaluated the students using a similar rubric. The statistical significance was measured between the student peer evaluation and lecturer assessment. The results showed that there is a negative relationship between peer and lecturer assessment. However, this finding is not significant ($p = 0.861$, > 0.05). In conclusion, the judicial use of technology will not only lighten the burden of administrative work in education but aids in the holistic evaluation of students in higher education.

Keywords: *technology, soft-skill, peer assessment, larger classroom, lecturer evaluation***Content**

As quoted in the Quantum theory, the observer affects the observed reality. So, when an examiner evaluates a student, the outcome of the evaluation is only based on the limited contact time between

the examiner and the student (Ardoin & Roof, 2008). Hence, the peer assessment is crucial to improve the evaluation system. The current study, two essences are included: 1) the peer assessment as a tool for holistic evaluation of student and to reflects the true performance of the students, and 2) the use of IoT (Internet of Things) through peer evaluation Google form which enhanced the feasibility of the peer assessment.

The innovation of the study is designing the student peer evaluation in a holistic way using technology. Often in the university settings, the group works were wholly evaluated where everyone in the group will share the same marks despite variation in individual contribution (Hassanien, 2006). This may falsely evaluate a student performance that could contribute to the production of the low-quality graduates (Hanapi & Nordin, 2014). Though this drawback of wholly group evaluation has been heavily discussed among Malaysia education sectors, no obvious steps have been implemented to improve the scenario. The obvious reason is lack of feasibility of individual evaluation in larger classrooms. The current study showed that such laborious evaluation could be feasible with the implementation of technology and indeed could lead to "true" evaluation of the students.

Two undergraduate pharmaceutical subjects were used as a model, personal care and biopharmaceuticals. In the personal care subject, 34 students were asked to work in a group (7 in a group) to produce a cosmetic product followed by pharmaceutical evaluation of the product. On the other hand, in the biopharmaceuticals, 105 students (5-6 in a group) were given a biopharmaceuticals related scenario to discuss amongst the group members and find potential solutions. After respective assignments, the students were requested to evaluate their group members through a Likert scale and open-ended question using a Google form as shown in Figure 1. The components being assessed including punctuality, the use of language, the preference to work with him/her again, contribution to the overall discussion, the possibility of future collaboration and cooperation. The respective lecturer also evaluated the students using a similar rubric through observing the students during the practical session and discussion. The statistical correlation between the peer and lecturer evaluation were measured using a Pearson test. In addition, a statistical analysis was performed to investigate the relationship between soft skill and the test marks at the end of the semester.

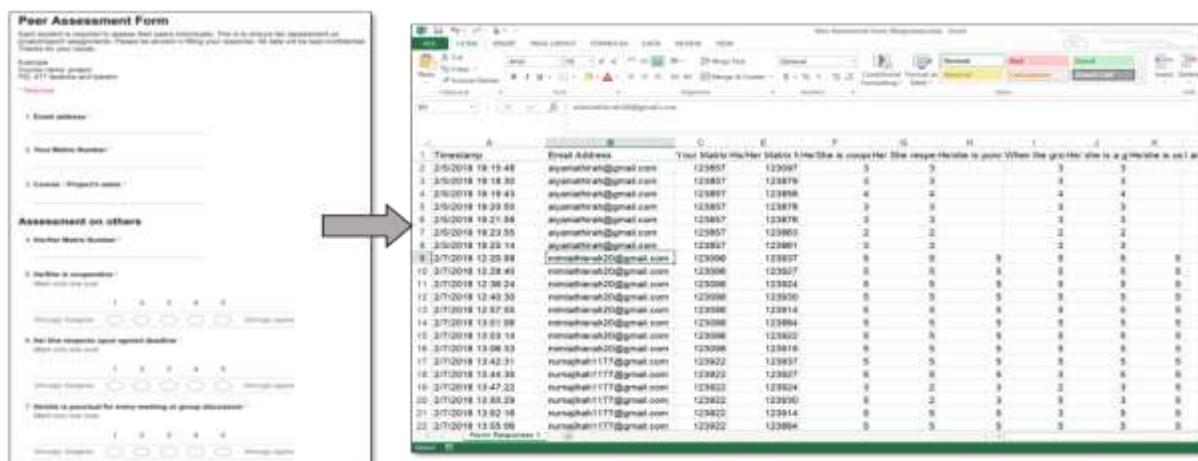


Figure 8: The peer assessment form with Google Form and the Google spreadsheet outcome

We found insignificant difference between peer and lecturer focus group assessment ($p = 0.861, > 0.05$). However, it was interesting to note a positive correlation between the test mark and the peer-evaluated soft skills which indicating that student with good grade tends to have good soft skills (Table 1). Hence, this finding negates the general belief among Malaysian that student with good result tends to have poor soft skills.

Table 1: Correlation analysis between peer and lecturer assessment vs. test mark

Correlation Analysis	R ²	Sig.
Peer assessment vs. test mark	0.547	0.000*
Lecturer assessment vs. test mark	0.009	0.861

The main value of the study is the peer evaluation using the Google Form. The use of Google Form has the potential to ease the soft skill evaluation of students in the large classroom without burdening the educator. Student satisfaction was also accomplished as they are aware of being assessed by the peers.

In conclusion, the judicious use of technology can lighten the burden of workload of educators and aids in a holistic evaluation of students in higher education. Given the education crisis in our country that potentially produce a large number of low-quality graduates, the problem was identified to lie in the assessment method. Thus, the user-friendly and widely available Google Form coupled with peer evaluation has the potential to improve the individual evaluation in the tertiary education. The study does not have any commercial value.

Acknowledgement (if any)

The authors would like to acknowledge the contribution of the students FEL 477/2: Personal care and FAR247/2: Biopharmaceuticals II, batch 2017/2018 for their contribution in assessing their peers.

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ID NO. USM006	TOPIC: MULTIMEDIA TECHNOLOGY AUDIO GLOSSARY (MTAG)

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Abstract:

We are now in a life that is surrounded by computer and multimedia technology, and it is already common to the community either among educators and students or the general public. Hence, the application of the Multimedia Technology Audio Glossary (MTAG) application is developed based on the mobile application of the Multimedia Glossary book published by Centre for Instructional Technology and Multimedia (PTPM), Universiti Sains Malaysia. The conventional book glossary requires users to flip every sheet of the book to search for the desired term. By having this innovation, this application is to make it easier for users to search for terms related to multimedia technology easily using the search engine by typing the term or using the voice recognition of the term. Voice recognition is the main features that can be used to make it easier for users to search for related terms. The description of these terms will display along with the visuals and audio of the terms. This MTAG is developed by using mobile Android platforms that use PHP scripts and MySQL databases to enable them to be accessed anytime and anywhere. At this stage, the number of terms provided is more than 1000 word entries. The new terms can be added by inserting new terms from time to time to ensure that it is appropriate to the current situation. The findings of the preliminary study show that it enables users to search for words or terms related to multimedia technology and to increase knowledge when users use the correct term. Comprehensive glossary forming of terms is expected to be a catalyst and motivation to all walks of life in updating the synthesis and dissemination of ideas more effectively and in quality.

Key words: *Multimedia Technology Glossary, Multimedia Technology, Mobile Application, Voice Recognition*

Description

Glossary means a list of terms along with their definition arranged in alphabetical order for a particular field of knowledge (4th Edition Kamus Dewan Bahasa). For this product, a list of technology multimedia terms is the main contents to define the terms along with the description and selected image of the terms. It also provides the voice recognition features that can be used to make it easier for users to search for related terms when they do not know how to spell the terms correctly. This MTAG product based on the mobile application and operated on the mobile platform so the user can access this application at any time and anywhere (Yahaya W.A.J.W., Zaini, K.M., 2018). The idea of this product comes from the book of the 'Glosari Multimedia' book published by Centre for Instructional Technology and Multimedia (PTPM), and it has more than 1000 registered terms of multimedia technology terms in Malay Language and English terms with the Malay Language description. This conventional book glossary requires users to flip every sheet of the book to search for the desired term. So by having this mobile application, it will make easier for users to search for terms related to multimedia technology easily using the search engine by typing the term. The user also can use the voice recognition of terms to find the definition of the terms.

Product Background

Life nowadays surrounded by computer and multimedia technology, and it is already common to the community either among educators and students or the general public. The usage of mobile devices also is very widespread by all people today make people spend more time with mobile to find information, make a decision, take action and also socialized with social media (Khairulnisak, 2017). So this combination of mobile application and multimedia technology terms is important to use for a field of knowledge.

This MTAG product is developed by using mobile Android platforms that use PHP scripts and MySQL databases to enable them to be accessed anytime and anywhere. At this stage, the number of terms provided is more than 1000 word terms entries. The new terms can be added by inserting new terms from time to time to ensure that it is appropriate to the current situation. The findings of the preliminary study show that it enables users to search for words or terms related to multimedia technology and to increase knowledge when users use the correct term.

There are other products similar to this product. For example the project of 'SignMedia SMART' by Hilzensauer & Krammer (2015). This project is a follow-up project of the Leonardo project 'SignMedia' which provided a vocational English course (English for the media industry) for deaf people who are sign language users. The 'SignMedia SMART' offers a free glossary of 500 media terms in four national sign language on a mobile platform, and it's available to the users on the go - access is possible anytime and anywhere with an internet connection. This project resulted get very positive feedback about the look and feel of the application as well as accessibility and functionality. The vocational relevance was emphasized by the testers.

Another project that similar to MTAG is a Glossary of Terms for ICT and E-Learning compare the Polish, Spanish and Russian Approach by Trybulska, Stec, Studenska, Naskova, Pavlova, Yakovleva (2017). This IRNet project is to select nations connected with e-learning, group them and present their definitions in the form of a glossary. Twenty-nine terms connected with e-learning were collected, and it's divided into four groups. The group concerned concepts related to information, competence, education and e-learning. Definitions of the nations regarded as basic were gathered from Russia, Poland and Spain and compared and it's shown similarity in the basic means they understood. The definitions also differ in the degree of specificity and the number of concept's aspects mentioned. This work hoped will serve as a reference both for the designer of e-learning courses and students.

Based on this two similar products compare with MTAG, it shows MTAG is better because it has more than 1000 terms of multimedia technology as at September 2018 and it will update time to time if we have new terms that related to that compare with 'SignMedia'. The same MTAG and 'SignMedia SMART' is the project can be used by disable person; 'SignMedia' project focuses on sign language that appropriate for hearing impaired person and MTAG that have voice recognition features that can be used by a visual impaired person. For the second project IRNet, its focuses on ICT and e-learning and it compared between Polish, Spanish and Russian that related to information, competence, education and e-learning but MTAG focuses on the multimedia terms.

Table 1: Comparison of the MTAG, SIGNMEDIA Smart and IRNet

Advantages	MTAG	SignMedia SMART	IRNet
Target group	All users	Deaf people	Education
Terms	More than 1000 terms	500 terms	Specific terms
Finding tools	Auto-typing, typing, voice-recognition	Web database – typing a complete word	Typing

Interest in Education

- Technology will always be got new terms in time to time in line with the current state of technology, and this product will update the news terms,
- A lot of new technology terms in the Malay Language will be more user BM in science and technology,
- Easy for experts in the technology field for students that less skilful in writing in English,
- As a reference for educators and teachers,
- Familiarize students with aspects of technology, mobile, voice recognition and the content of digital and audio, and
- Add the multimedia technology glossary in corpus database.

Advantages

- This application is operated by using mobile devices. Therefore anyone can use at any time and anywhere,
- This application applies the description of each term with the selected image,
- This application has voice recognition features, and the user can find a term using voice so individual with visual impaired also can use it,
- To make finding the term easier and faster,
- As a reference and guideline to the user who has basic Malay Language,
- Have more than 1000 terms of multimedia technology,
- To gain knowledge in multimedia technology from whom come from a non-technical background, and
- Voice recognition – this features can be used by the ordinary user and also for user who is visual-impaired.

Commercial Value

This product has commercial value like to expand the use of Malay Language vocabulary terms that are not using the Malay Language. The main language of this application is Malay Language and the description or explanation also in Malay, but it's also defined in English. So it can be used by a user of research cooperation and technology industry. This apps also can be used by disable person with visual impaired because it has voice recognition features. The other value of this product is it's replacing physical multimedia glossary book with a digital audiobook. So it will make the finding terms easier and faster with the image and audio description of the selected terms.

Conclusion

Comprehensive glossary forming of terms is expected to be a catalyst and motivation to all walks of life in updating the synthesis and dissemination of ideas more effectively and in quality. In addition to that, the processes for finding the terms with definition, visual as well as audio for term description is noble for the use of educator, students and the general public.

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ppendix (The flow on how the product work)



ID NO. USM007	TOPIC: SEJAHTERA LESTARI: A MOBILE HEALTH APPLICATION FOR VISUAL IMPAIRED INDIVIDUAL (CHRONIC ILLNESS – HIGH BLOOD PRESSURE)

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Abstract: This project explores the development of a mobile health application which was designed to disseminate information regarding one of the major chronic illnesses in Malaysia; high blood pressure. As reported by Statistics of Malaysia Social Welfare Department, majority of persons with visual impaired are adults which are more prone towards the main chronic illnesses in Malaysia. Support ought to be provided to disseminate health information to this group through various platforms, and one of the potential medium is through mobile application or specifically known as mobile assistive technology. 2 respondents are chosen in this preliminary study. 1 respondent who is totally blind and 1 respondent with low vision were interviewed. Interview schedule was adopted and adapted based on the checklist as highlighted in Hoehle and Venkantesh (2015) in exploring the usability of mobile application. Both respondents showed positive responds to the variables explored; i) Application design, ii) Application utility, iii) User interface output, iv) User interface structure, v) Continued intention to use, and vi) Mobile application loyalty. Overall, this study contributes toward the body of knowledge in mobile assistive technology, persuasive technology and mobile health application in Malaysia. The study does not only develop a mobile health application to support visual impaired individual but also adds value in understanding the situation regarding the use of mobile health application to support this group. As the conclusion, this study has established that the use of this mobile health application, Sejahtera Lestari can be used as a medium of information which is suitable for the visual impaired individual. In the future, the study will be continued in adding more information about other illnesses as well as exploring the possibility of the mobile health application in raising awareness of the visual impaired people about the main illness in Malaysia.

Key words: Mobile application; mobile health application; assistive technology, visual impaired.

Introduction

There are two main categories of vision problem which is blindness and low vision. According to The World Health Organization (WHO), blindness is defined as vision which is less than 3/60, on the best eye or vision field less than 10 degrees after receiving treatment or regular correction (refractive) [1]. On the other hand, The World Health Organization (WHO) defined low vision as vision which is less than 6/18 to the light perception of the best eye or vision field is less than 10 degrees after treatment or regular refractive [1].

Statistics of Social Welfare Department 2015 [2] reported that, in 2015, from 365,677 people with disabilities, there are 32,807 individuals with visual problem. The classifications of these individuals according to age are as the following: i) Below 6 years old - 374 people; ii) 7 to 12 years old - 1446 people; iii) 13 to 18 years old - 1881 people; iv) 19 to 21 years old - 1111 people; v) 22 to 35 years old - 5511 people; vi) 36 to 45 years old - 4753 people; vii) 46 to 59 years old - 8976 people; viii) 60 years and above - 8755 people. From this statistic, it can be concluded that the majority of persons with visual impaired are adult which are more susceptible towards the main chronic illnesses in Malaysia. Therefore, it is important to disseminate health information to this group of people. Support ought to be provided through various platforms, and one of the potential medium is through mobile application or specifically known as mobile assistive technology.

According to Mohamad & Phung [3], mobile assistive technology can be defined as technology that is portable in nature which is used to enhance the capabilities of persons with disabilities. Mobile assistive technology has been widely used to help persons with disabilities including those with visual impaired. There are numerous studies conducted globally and locally. These include a study on the development of a mechanism known as MoBraille to connect Android smartphones to a Braille display which serves as an input and output platform [4]. In another study, a mobile assistive technology was developed by (Kulyukin and Kutuyanawala, 2010) [5] to assist visual impaired shoppers. In local setting, there was a development of a mobile phone based Braille application, mBRAILLE, to provide an easy Braille learning technology for visual impaired student [6]. Mohamad & Muniandy (2014) [7], in their studies explored the challenges of a visual impaired student in handling mobile assistive technology in everyday tasks and also for learning purpose.

In addition to mobile assistive technology, the mobile health application which was developed in this study is also underpinned by persuasive technology. Combining mobile assistive technology and persuasive technology has the possibility to bring impact in the health sector has been advocated by Osman et al (2016) [8] which helped create awareness about healthy life style. Persuasive technology as according to Fogg (2003) [9] is defined as technology which is designed to change the attitudes or behaviors of users through persuasion and social influence, but not through coercion. Persuasive technology combined with mobile technology has been proven as an effective medium. This has been explored in the study by Mohd Zaini & Wan Yahya (2016) [10] in which multimedia persuasive application was developed to reduce students' anxiety towards Islamic funeral. Moreover, in another study by Abdul Wahab & Wan Yahya (2016) [11], explored the feasibility of developing a multimedia application to raise awareness in regard to cyber bullying.

Globally, there are commercial mobile health applications such as ChronicCareIQ [12], MediSafe [13] and WebMD Symptom Checker [14]. However, there is no existence of a mobile health application to support visual impaired audience especially in Malay language. This was confirmed by a medical doctor from Sejahtera Centre, Universiti Sains Malaysia. Therefore, the research will look into the possibility of the use of mobile health application specifically to support visual impaired group.

Methodology

The research design of this study is qualitative and based on a case study methodology to explore the use of mobile health application for the visual impaired individual. Data collection includes observation during the use of mobile application as well as interviews with the respondents. 2 respondents are chosen in the preliminary study; 1 respondent who is totally blind and another 1 respondent with low vision. In the study, validity and reliability are emphasized. Validity is ensured through sampling strategy. Participants are chosen based on the rationale that they would fulfill the purpose of the study. On the other hand, reliability is ensured by following the research procedure, the observation and interview.

In this study, a mobile health application entitled Sejahtera Lestari was developed to provide health information to the visual impaired individual about the major chronic illnesses in Malaysia. The mobile health application consisted of the first series of main illness, High Blood Pressure. Future studies will include 20 types of diseases in this series of mobile health application. The mobile health application is available in both audio and visual form, tailored for both blind and visual impaired individual. The audio for each type of disease is 60 minutes long. This mobile health application contains the following information: i) Introduction, ii) Symptoms, iii) Nutritional recommendations, iv) Preliminary treatment (prevention), v) Prayer and Alternative Suggestions, vi) FAQ (Doctor Advice).

Audio application is generated through sound recording. This audio application is produced in mp3 format which can be used and integrated in various technology and hardware mediums, including: i) Applications in Tablets and Smart Phones (Android), ii) CD / VCD / DVD, iii) Thumb Drive, iv) Interactive Kiosk Panel, v) Multimedia System / Computer Display (Windows / Mac OS / Linux), and vi) SD Card.

This mobile health application is also supported with voice recognition and talk back function. As this application is tailored for the visual impaired, the interface developed is also compatible to renowned software; JAWS and NVDA which can support the navigation for those with visual problem. The language

used is in the mobile health application is the Malaysia National Language which is Bahasa Malaysia. This application can be further customized to the languages (dialects) of the major states in Malaysia.

With regard to the first respondent who have low vision, the respondent has been reported to use android smart phone. Respondent was also familiar with the talk back function in the android smartphone. It has been observed that the respondents hold the smartphone and placed it closer to one ear as well as look in a short distance to select the button in the application with the support of talk back function and the screen display. Moreover, the respondent also has been reported to be familiar with the Google Now application when asked about voice recognition.

Regarding the second respondent who is totally blind, the respondent has been using iPhone and also familiar with voice over function (screen reader) which is available in all Apple product which have similar function as in the android smart phone. The respondent was observed to place the smartphone closer to one ear with the support of talk back function. Respondent also tried to use voice recognition. Respondent agreed that both talk back and voice recognition has the same level of importance.

Findings

The paper reports the preliminary study, which consisted of observation and interview with 2 respondents; 1 respondent who is totally blind and another 1 respondent with low vision. Interview schedule was adopted and adapted based on the checklist as highlighted in Hoehle and Venkantesh (2015) [15] in exploring the usability of mobile application. The following table describes the important aspects that were covered in the checklist:

Outcome variable	Item used
Application design	Overall, I think the mobile application is designed well
	I general, I believe that the mobile application has a great design.
	Generally speaking, the mobile application is well designed.
	I am very satisfied with the overall design of the mobile application.
Application utility	To me, the mobile application is useful.
	Overall, I think that the mobile application is useful.
	Generally speaking, the mobile application serves its purpose well.
	In general, the mobile application is of value to me.
User interface output	In general, the content of the application is presented effectively.
	Overall, I believe that the mobile application presents content very well.
	Overall, I think that the mobile application presents content effectively.
	I am satisfied with the way that the mobile application presents content.
User interface structure	Overall, I think the mobile application structures information effectively.
	In general, the mobile application is structured very well.
	I am very satisfied with the way the mobile application is structured.
	Generally speaking, the mobile application is structured nicely.
Continued intention to use	I intend to continue using the mobile application.
	I want to continue using the mobile application rather than discontinue.
	I predict I will continue using the mobile application.
	I plan to continue using the mobile application.
Mobile application loyalty	I encourage friends and relatives to be the customers of the mobile application.
	I say positive things about the mobile application to other people.
	I will use more services offered by the mobile application in the next few years.
	I consider the mobile application to be my first choice.

Table 2: Usability checklist based on Hoehle and Venkantesh (2015)

With regard to the checklist, both respondents showed positive responds to the variables explored; i) Application design, ii) Application utility, iii) User interface output, iv) User interface structure, v) Continued intention to use, and vi) Mobile application loyalty. The respondent with low vision was interested with the voice recognition in the mobile health application. Both respondents believed that the application provides the knowledge which is valuable to the community especially to those with visual problem.

However, in addition to the checklist, there are emerging points that were highlighted by the respondents. As suggested by the respondent with low vision, there is a need to improve the size of the text in the application to enhance the visibility. Another respondent suggested to enhance the voice recognition function, where it was reported to be slight delay when responding.

Conclusion

In this study, both respondents showed positive feedbacks towards the mobile health application. Overall, they had positive experience in using the application and had shown the willingness to use it when it is available commercially in the near future. This is in accordance to the suggestion by Sierra and Roca de Togores [16] which highlighted that the best way to evaluate the effectiveness of an application is through gauging user experience.

This study contributes toward the body of knowledge in mobile assistive technology, persuasive technology and mobile health application in Malaysia. The study does not only develop a mobile health application to support visual impaired individual but also adds value in understanding the situation regarding the use of mobile health application to support this group. This mobile health application is an effort to disseminate health information to the community through mobile technologies. The target of this mobile health application is for the visual impaired individual (blind), where they will be supported with audio and haptic touch element in navigating the application. However, those with low vision can also gain the benefit from this application because in addition to audio support, interesting and informative visual display is also presented. As there is no existing mobile health application to support visual impaired audience in Malay Language, this study could be considered a groundbreaking attempt to provide the mechanism. It is envisaged that the mobile health application would have the potential to be used to support this group.

As the conclusion, this study has established that the use of this mobile health application, Sejahtera Lestari can be used as a medium of information which is suitable for the visual impaired individual. In the future, the study will be continued in adding more information about other illnesses as well as exploring the possibility of the mobile health application in raising awareness of the visual impaired people about the main illness in Malaysia and also exploring their attitude toward the use of mobile health application.

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ID NO. USM008
TOPIC: *PhysiAid*: Physical Multimedia Learning System in First Aid Kits for Preschoolers
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Abstract: Current years have witnessed significant innovation in digital educational systems. However, there exists an inconspicuous problem in such systems for preschoolers. Based on Piaget's theory of cognitive development, preschoolers are children in state of preoperational level where their learning attained is highly dependent on external concrete stimuli. Conversely, multimedia only conveys information using digital visual and auditory channels. The repercussion for these two opposite ends is a large learning gap. In light of the Piaget theory where physical objects are the attribute aligned to the preschoolers' cognition, a genre of multimedia augmented with physical objects, termed as physical multimedia has been conceived. We have developed a relevant prototype entitled "*PhysiAid*" aimed to deliver knowledge on items involved in the first aid kit, and how and when they are used in the treatment process. The physical and multimedia objects binding in *PhysiAid* is implemented through the adaptation of sensors technology, which comprises RFID, spatial sensors, and electronic sliders. Each physical object is glued with sensor. Its learning process starts when a preschooler grasps a physical object, and points it to the sensors to trigger virtual learning object on computer screen to respond and animate. An analysis of research on 248 preschoolers led to the conclusion that physical multimedia is one source of enjoyment in multimedia learning for preschoolers.

Key words: *physical multimedia, first aid, preschooler, Physical object, educational technology*

Background of Research

Present years we observe substantial innovation in educational technologies. Various prominent features such as virtual and augment reality, 3D stereoscopic, 360° Panorama, or touch-screen capacities have been embraced in aid of teaching and learning. However, for preschoolers who have distinctive nature connoted by Piaget (1972), an inconspicuous problem in such features is that they are not aligned to preschoolers' preoperational level of cognitive structure, a level that defined learning accomplishment as largely dependent on external concrete stimuli (Piaget, 1952, 1972). Preschool education is pivotal. The age of three to six years is a phenomenal period of growth for all children (Kriakova, 2010). Therefore, appropriate learning settings must be configured to support their learning optimally. Realising this, we propose and develop a genre of multimedia system augmented with a strategy that could bridge the gap between the current educational technologies and preschoolers (figure 1a). The system is termed as physical multimedia, a new breed of system that supports the use of external concrete stimuli. In order to make sense of the concepts learned, the preschoolers must grip the physical objects within the multimedia system. For the purpose of research, a relevant prototype entitled "*PhysiAid*" has been developed.

Description of PhysiAid System

PhysiAid is a prototype of physical multimedia learning system in first aid kit learning designed based on the notion of Piaget's theory of cognitive development (Piaget, 1952, 1972). The points of view of the theory explicitly rationalises the role of learning activities associated with physical objects. Thus, we deemphasise the touch screen innovation commonly deployed today. Instead, we sort out a new attribute necessary for cognitive learning to take place effectively – physical objects.

PhysiAid comprises two arenas, that is, physical arena and virtual arena. Physical arena consists of a display table, speaker, mouse, keyboard, monitor, CPU, and an array of physical first aid items whereas virtual arena composed of virtual first aid items and background scene. The physical and virtual first aid items binding are executed through the adaptation of sensors technology, which comprises RFID readers, spatial sensors, and electronic sliders (Figure 1b). Each physical first aid item is glued with sensor devices.

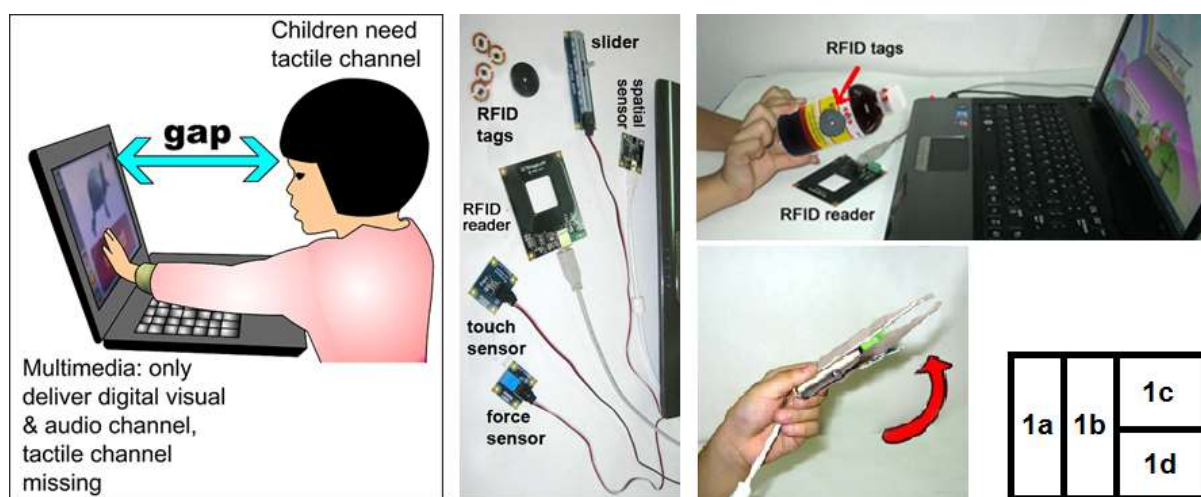


Figure 1. Gap between Digital Multimedia and Preschoolers' Cognition (non-existence of concrete stimuli) and Implementation of Physicality in *PhysiAid* using Sensor Devices in *PhysiAid*

RFID reader and tags are installed to identify physical objects. It is done in a way that RFID tag is inserted into a physical first aid item. When the physical first aid item is moved towards the field of radio wave generated by a compatible RFID reader, the tag will communicate the unique identification code to the reader, thereby launching mutual connection that allows the computer to identify the item (Figure 1c).

As gestural movements is one of the human innate traits (Sharlin, Watson, Kitamura, Kishino, & Itoh, 2004; Xie, 2008). Thus, performing movements in physical space in *PhysiAid* is also designed. In this regards, spatial sensor (Figure 1d) and slider are attached on physical first aid items for the purpose of spatial movement. By performing simple gestural movement suit to the preschoolers' level of mental structure and motor acuity, *PhysiAid* potentially increase the learning performance of preschoolers.

The whole learning process in *PhysiAid* system is designed in a cyclical sequential format that the preschoolers commence learning from physical objects exploration in the learning session, followed by presentation of multimedia contents for conceptualisation, and then the reinforcement of the concepts by participating in quiz section associated with physical objects. The learning session is the section where the learning objects pertaining to first aid kit are shown to the preschoolers. Preschoolers who enter the learning session would find themselves entering a virtual arena which was "surrounded" by many randomly-placed physical objects such as cotton, acriflavine solution, tweezers, antiseptic solution, and

bandages. The virtual objects in the virtual arena are bound to sensor augmented physical objects placed on display table in front of the preschoolers, as shown in Figure 1c.

The learning objects, either virtual or physical objects, referred to the knowledge unit that we intended to deliver. Through *PhysiAid*, the preschoolers are expected to learn English words and gain general knowledge about the first aid kit items. Meaning that, within 20 minutes, the preschoolers are expected to learn the name, relevant key words, and featural knowledge of the items in the first aid kit, and the way to use them. The multimedia expressions that tied to the learning objects offer rich definitional, contextual and featural information about the items learned.

To proceed, preschoolers are required to "grab" a physical object on the table, and depending on the type of sensor attached to the physical objects. The learning process starts when they points the object, for example the acriflavine solution, to the sensor devices to trigger the virtual acriflavine to respond and animate, or perform gestural movements to trigger corresponding virtual learning objects to display learning contents, such as the name of the acriflavine in written text, its pronunciation, and additional information about the acriflavine on the computer screen.

The preschoolers are free to explore any learning object by grabbing any physical object, or to exit. In other words, preschoolers themselves pace the lessons, and decide which object to explore based on their interests and needs. They also could click the quiz session anytime they like. With concrete experience of the physical first aid kit in hand, they gain better the concept of the items.

Importance of *PhysiAid* to education

PhysiAid moves beyond many of the research questions commonly done in multimedia realm. Though it is well accepted that tactile information facilitates learning, the research for the role of tactile information in the multimedia education for preschoolers has not yet been well established. That is to say the research is the pioneering multimedia research that explicitly rationalises the use of physical objects in knowledge acquisition.

The research delivers a prototype of physical multimedia (*PhysiAid*) which manifested the tactile attribute for preschoolers. The successful development of such prototype showcases an innovative instructional approach to knowledge attainment among Malaysian preschoolers, subsequently contributed significantly to the existing body of multimedia system for children as well as the existing empirical research base that examines the educational impact of tangible systems.

The findings are of considerable value, and had practical implications in identification of novel multimedia-based treatments that facilitate learning in topics related to first aid. The research not only provides insight on the efficacy of the system, but also a good view of the Malaysian preschoolers' level of acceptance of such system. The overall findings from the research could form as a basis for kindergarten operators, administrator, policy makers, and educators to decide, or prepare them in applying the physical multimedia to the existing educational settings.

Advantages of *PhysiAid* towards education and community

One of the pragmatic advantages of *PhysiAid* is it deepens into the scope of research on multimedia into the aspect of cognitive learning of learners, which is rarely conducted in multimedia research. *PhysiAid* is unified with physical objects; in the meantime, researching the development of the ability to maintain object representations in cognition was a core studied realm of Piaget (Zosh, 2009). Looking at the nature of the physical multimedia which does not demand the mastery of language and physical monitor skills for interaction with the computer, the success of the research creates the potentials to suggest an alternative to the conventional multimedia systems for use in community in general, and kindergartens in specific. *PhysiAid* also stands a good position to facilitate learning for use in primary schools in Malaysia, or even people with learning disabilities.

Commercial value in terms of marketability or profitability of *PhysiAid*

In 2015, the number of preschool students in government and government-aided schools is 198,574 (Department of Statistics Malaysia, 2015). This prepares huge commercial market for *PhysiAid*.

Findings

A total of 248 preschoolers aged five and six from seven Malaysian private kindergartens were recruited as the research evaluators in order to assess the capability of the prototype. Unstructured observation and questionnaires (*Smileyometer*) were engaged to elicit ideas pertaining to the use of the *PhysiAid* from the preschoolers.

Observation revealed that the most attractive feature in *PhysiAid* to the preschoolers was the physical objects - first aid items. The preschoolers were inquisitive to learn the learning objects. They deliberately explored the physical objects organised in front of them. They tinkered with the physical first aid items and attempted different positions and alignments to the computer. None of the evaluators indicated that they wanted to stop prior to completion of the allocated amount of time for learning in the learning session. Physical sensation of objects was believed to have enhanced their interest of learning.

Smileyometer were used to assess the participants' level of enjoyment respectively. We referred the enjoyment to "joy-of-use" of using *PhysiAid*. The self-report instrument was modified to be child-friendly by the use of smiley, a pictorial representation of dissimilar types of happy faces to signify the diverse levels of enjoyment. The research discovered that the participating preschoolers generally rated their state of enjoyment of using the *PhysiAid* with the high score (enjoyed and enjoyed very much) in *Smileyometer*. It is believed that iterative hands-on experiences enriched with multimedia expressions contributed to the positive outcome.

Conclusion

The finding of the research conveys implication that physical objects could afford the physical affordances prescribed by Piaget's theory of cognitive development in multimedia lessons effectively. The positive result in the research provides a synopsis of the ability of physical multimedia in bridging the learning gap between preschoolers and multimedia. The design of the prototype of physical multimedia, *PhysiAid* system is rudimentary. We wish more research efforts on the physical multimedia to overcome the limitations posed by *PhysiAid* in the research.

Acknowledgement

Our deepest gratitude goes to Dr. Mariam Mohamad, Faridah Hashim, Rozita Ilamdin, Norazam Ariffin, Abdul Haris Harun, and Khairulnisak Mohamad Zaini for the unending support in making the trip to IUCEL possible.

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ID NO. USM 009**TOPIC: i-OEL CNC Machining via eLearn@USM****Mohd Salman Abu Mansor**

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Abstract:

Previous teaching method for laboratory course is in the form of fully guided experiment and there are no opportunities for the learners to explore their own Computer Numerical Control (CNC) Machining experimental work. Therefore, an Open Ended Laboratory (OEL) for CNC Machining experiment is utilized for enhancing creativity and independent learning cultures among the learners. On top of that, **i-OEL CNC Machining** is introduced in order to improve the teaching and learning process of an OEL for CNC Machining experiment through **eLearn@USM**. **i-OEL** is an abbreviation that stands for innovative-Open Ended Laboratory. Two Instructional Design strategies are used namely Scenario-Based Learning and Gamification. Since the previous teaching method for laboratory course is no longer adequate for the learning process especially in Industrial Revolution 4.0 environment, thus this CNC Machining experiment is designed by using e-learning to attain these two objectives i.e. (i) to provide a platform where learners are given opportunities to explore their own CNC Machining experimental work, and (ii) to enhance creativity of learners in producing new product through CNC Machining experiment. The targeted group for **i-OEL CNC Machining** is manufacturing engineering undergraduate students. However, it is also can be learned by the others who are really interested to know about this CNC Machining experimental work. **i-OEL CNC Machining** can stimulate their prior knowledge, grab their attention via online task submission, assess their performance simultaneously and obtain their feedback quickly. Through this teaching innovation, learners can rapidly perform their experimental work on creating new product by using CNC Machining.

Key words:

Open Ended Laboratory, CNC Machining, e-Learning, Instructional Design, Teaching Method.

Acknowledgement

The author would like to thank School of Mechanical Engineering, Centre for Development of Academic Excellence (CDAE) and Universiti Sains Malaysia for supporting this teaching innovation work and giving the opportunity to participate in the International University Carnival on E-Learning (IUCEL) 2018.

ID NO. USM 010**TOPIC: The application of e-book as laboratory practical guide for pharmacy students****Amirah Mohd Gazzali**

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Abstract:

The e-book phenomenon has taken us to a whole new era in knowledge dissemination. Although printed books still have their place in the heart of many, the application of e-book may compliment the current role of printed books, besides serving as an option for lower cost and less physical storage space. Pharmacy, as of other professional courses, requires the development of specific knowledge and different skills among its graduates and among others are practical skills in compounding and dispensing of medications. Printed book has always been a source of reference for students. However, this is not always practical especially in the laboratory settings whereby rapid students' mobilization in the laboratory may cause liquid spillage and unwanted accidents on the books laying on the working bench. Hence, e-book may become a handy option with up-to-date information at a very low cost. The fact that nearly all students are currently owning a smartphone has enhanced the possibility of using an e-book as a laboratory guide.

The current invention comprises of an e-book on laboratory practical guide which provides guidance to the students on lab ethics, product documentation, prescription interpretation and pre-formulation calculation, with embedded product preparation videos for easy and fast referencing. Students will be able to refer to the videos in the e-book during practical classes to learn and avoid any mistakes during product preparations. This approach is believed to be able to enhance the students' learning experience while minimizing the unwanted accidents and mistakes commonly associated with practical classes.

Key words: e-book; pharmacy; laboratory guide; compounding

Content

Compounding is a discipline taught only in pharmacy schools which teaches pharmacy students on the science and techniques needed to produce stable pharmaceutical products. Although in the current pharmacy setting the practice of compounding has reduces tremendously due to the availability of pre-formulated manufactured products from the industry, compounding continues to be taught in pharmacy schools around the world due to its significance in the overall pharmacy curriculum and in the building of skillful pharmacists. In the teaching and learning of compounding, laboratory practical sessions are very important because of the nature of the course that requires students to acquire certain skills and techniques in product preparation. The laboratory sessions usually contributed to a big portion of the course.

During compounding laboratory sessions, students are usually in a very busy and fast-paced situation. The conventional printed books commonly came in their way and many spillage and destruction of books were recorded over the years. E-book could hence come in handy and be an alternative to the printed books. It could easily be saved in the mobile phones, referred to during the practical sessions and tucked in safely in the pocket when not in-used. This would minimize the books laying on the bench and hence increase the working efficiency of the students.

The current invention comprises of an e-book on laboratory practical guide for pharmaceutical compounding with guidance on lab ethics, product documentation, prescription interpretation and pre-formulation calculation. The e-book also comes with embedded product preparation videos for easy

and fast referencing during practical classes. Students will be able to refer to the videos in the e-book during compounding practice to learn and avoid any mistakes during product preparations. Among other interesting features are Latin abbreviations for medical use, common medical terms for pharmacy students and calculation exercises related to compounding of extemporaneous preparations.

In addition, many, if not most, of pharmaceutical compounding books available in the market (including e-books) are expensive which limit the accessibility of students to good reference book. Since compounding are usually taught during the first year of pharmacy bachelor program, students are commonly in dire need of useful reference. This e-book would be a useful guide and quick reference material for students, which could lead students to choose useful further reading materials. The e-book produced is a copyrighted product and will be available to be marketed to all pharmacy schools locally and internationally. As there are more than 20 pharmacy schools in the country alone, it is believed that the marketing potential is big and could be slowly expanded to international users. The usability and application of this e-book was surveyed among first-year students of School of Pharmaceutical Sciences (n=54). Students responded positively with only less than 10% students were not in favor of using this e-book in laboratory sessions (as depicted in the attached figure).

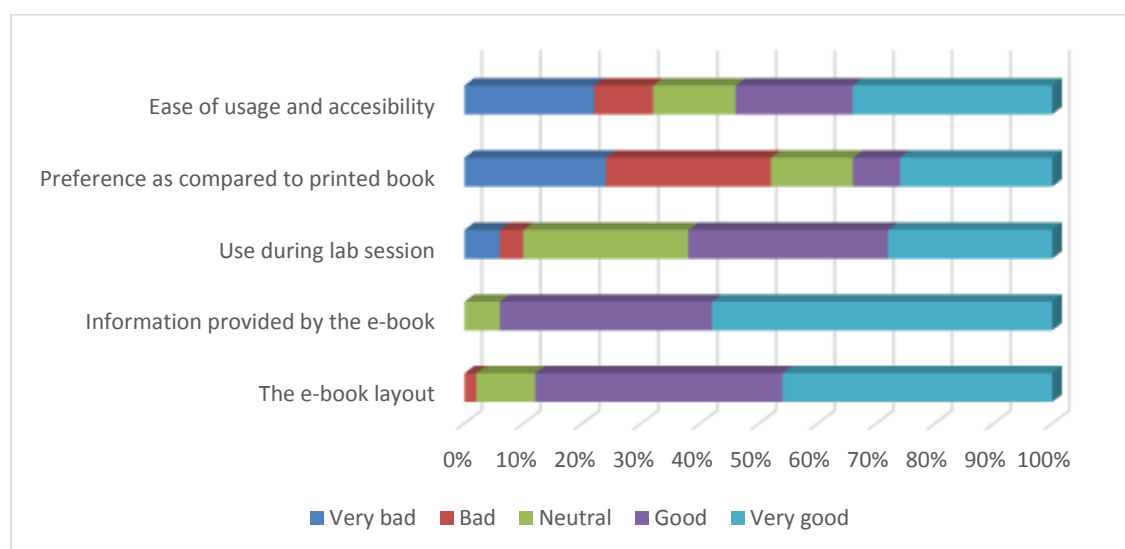


Figure: Students' opinion on the use of the e-book (n=54)

Acknowledgement

We would like to thank the students that were involved in this study for their constructive comments and feedbacks. We also acknowledge the Centre for Development of Academic Excellence & Student Development (CDAE@USM) and USM as a whole for providing financial assistance and allowing us the opportunity to participate in IUCEL 2018.

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ID NO. USM 011	TOPIC: Let's L.A.S.E. the Clinic (Learn, Acquire, Simulate, Execute)

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Content

Good communication and drug information search skills help students to practise in a professional and competent manner (Fejzic and Barker 2015). Simulation activity is a smart way to maximize students' potential, saving cost and time for both teacher and student over a controlled, low-risk learning environment (Hassan et. al 2017). Advancement in pharmacy education demands innovative and simulation based learning to enhance knowledge, self-confidence and encourage critical thinking (Seybert 2011). Let's L.A.S.E. the Clinic (Learn, Acquire, Simulate, Execute) module was initiated for the final year students of School of Pharmaceutical Sciences, Universiti Sains Malaysia for their clerkship activity. This activity also combines group discussions through e-learning portal with close online monitoring and guidance. The clerkship is divided into 4 structured activities:

17. Module A : **Learn** : students will learn on the in-depth disease knowledge and basic presentation skills
18. Module B: **Acquire**: students will acquire new technique to disseminate information for individual or public interactively – using handwritten tutorial approach
19. Module C: **Simulate** : students will have to come up with a prototype for information dissemination
20. Module D: **Execute** : Objective Structured Pharmacy Examination (OSPhE) will be performed where students will utilize all the skills and knowledge acquired during the clerkship.

The module is that it is a practical approach in preparing them for a holistic approach on information dissemination and counseling activities. Students who have gone through this process gave feedbacks such as "We get new knowledge and experience real life scenario", "This module is beneficial and convenient for discussion and improves my knowledge", "It has built and improved my communication skills" and "The activity has encouraged me to learn and search information effectively". Hence, the students are more confident and well-prepared to enter the workforce. This module is also transferable or adaptable for other courses that involve knowledge imparting to general public especially in courses that involves communication skills.



Acknowledgement

We are indebted to the Discipline of Clinical Pharmacy for allowing us to incorporate the Let's L.A.S.E. the Clinic module as one of the clerkship activity. We extend our gratitude to the students who worked hard and gave their feedback to make this activity a success. We are also grateful to CDAE and USM for sponsoring our participation in IUCEL 2018.

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ID NO. USM 012

**TOPIC: BULLYING KNOWLEDGE DEVELOPMENT MODULE -
2BS PROGRAM: I'M A BUDDY NOT A BULLY.**

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Abstract: Bullying is one of the most worrying issues among teachers, parents, and students. Hence, prevention action should be taken to prevent bullying at school. The Bullying Knowledge Development Module (MPPTB) is a module derived from the '2Bs Program: I'm a Buddy not a Bully' which aims to overcome the widespread bullying phenomenon among the students in the secondary school. A study that has been conducted identified that there is a significant correlation between a low level of the knowledge on bullying with the act of bullying (Jamalsafri, 2010). Hence, the MPPTB module emphasizes on the development of knowledge and awareness on bullying. Creative and fun pedagogy have been used as an approach to achieve the objectives of this module. This creative pedagogical approach is the core of this program, which disseminates bullying behavior knowledge. This approach has been applied in each station through interactive activities between students and the facilitator. The elements of creative pedagogy that have been applied to each station are music, sculpture, poetry, acting, dance, paper collage, small game, interactive quizzes, and puppet shows with a bullying theme. This approach is in line with the target group for this program i.e. students who are in their teens and enjoy interactive activities. As such, it is necessary to examine to what extent a creative pedagogical approach may increase knowledge about bullying behavior. This module consisted of 4 series of the subject related activities, employing the creative pedagogy approaches and game-based learning. Through the implementation of this module, the 2Bs program has been successfully attracted the students' interest and has been able to effectively achieved the learning objectives. Experimental studies conducted in Penang and Perlis showed that the implementation of this module has been able to effectively increased the students' knowledge and awareness in bullying and indirectly helps to overcome the issue of bullying in schools. The effectiveness of this MPPTB module is also confirmed when this 'Program 2Bs: I'm a Buddy not a Bully' won the EIU Best Practices Award, organized by the Asia Pacific Center of Education International Understanding APCEIU) under UNESCO, South Korea.

Key words: *Bullying Knowledge Development Module, the act of bullying, Program 2Bs: I'm a buddy not a bully.*

References:

ID NO. USM 013	TOPIC: BLENDED LEARNING IN THE COMMUNICATION SKILLS IN PHARMACY PRACTICE COURSE FOR UNDERGRADUATES

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Abstract: Communication Skills in Pharmacy Practice is introduced in the first-year pharmacy undergraduates. In this blended learning, the teaching materials were uploaded in the e-learning before lecture sessions. The lecture slots were divided into teaching by lecturers and role-play in groups by the students. Additional teaching materials were taught during the lecture to complement the materials provided in the e-learning. For the role-play activity, the students need to prepare and act out a bad and a good case related to the pharmacist-patient communication. The lecturer gave feedbacks on their performance, so improvement can be done before submitting their final report.

The students provided their feedback on the course via e-learning. Positive students' feedbacks were obtained, for example "In my opinion, learning of this course is effective to improve effective communication between pharmacists and patients in order to achieve optimum therapeutic effect", "A very interesting course and give me a rough idea that what I will face in the future and the way to solve it." and "I love the way our lecturers teach us by showing some videos as example and they explained clearly about communication skills."

With this approach, the students can have access to the material and learn at their own pace before lecture session. They can portray their understanding by creating the cases and doing the role-play. Improvement to students' understanding and communication skills can be achieved by the feedbacks from the lecturers. This is a fun learning approach in communication skills for the tertiary education.

Key words: *blended learning, communication skill, pharmacy practice course, undergraduates*

Introduction

Communication Skills in Pharmacy Practice is one of the courses for the first year student of Bachelor of Science Pharmacy, USM. The aim of this are to: i) introduce the concept and model of interpersonal communication, ii) develop the skills to apply the technique of verbal and nonverbal communication effectively, iii) describe and apply the approach to medication counselling and describe the element for effective communication in the pharmacy practice. The topics included in the course are introduction to communication in pharmaceutical care, the basics of pharmacist-patient interactions, non-verbal communication, skills for delivering and answering drug information, and skills for effective presentations. As this course is focusing on the communication skills, the teaching innovation in the form of blended learning was introduced in this course, in which the flipped classroom, active learning, presentations and role-play activities were combined, to fulfil the learning objectives.

Blended learning is a learning program in which more than one delivery methods is being used in the teaching and learning to achieve the objective of optimizing the learning outcome and cost of program delivery. Blended learning incorporates the traditional (face-to-face interaction with lecturers) and online learning. Students are the active learners and the centre of teaching and learning process to achieve curriculum diversity.

Content

Description of innovation

This innovation is related to the combination of flipped classroom, active learning, presentations and role-play activities throughout the blended teaching and learning process. For flipped classroom, the teaching materials were uploaded in the e-learning portal one week before each lecture session. The lecture slots were divided into teaching and discussion with lecturers as well as role-play in groups by the students.

Additional teaching materials were taught during the lecture to complement the materials provided in the e-learning, for further discussion related to the topic. For the role-play activity, the students need to prepare in writing and act out a bad and a good case related to the pharmacist-patient communication. The role-play can be performed in the form of video recording (before the lecture session) or live during the lecture hours. By doing the writing and role-play, the students acquired the skills of interpersonal communication, practice the bad and the good approaches to medication counselling as well as skills for effective communication. Besides than role-play, the students will also need to present their case, so that they can develop the skills of effective presentations.

The lecturers upload their feedback into the e-learning portal on the students' performance related to the content of the role-play as well as their presentation style. In doing this, improvement on the cases can be done before submitting their assignment as the final report. Another assessment in the form of written quiz was also performed to evaluate students' knowledge on the topics.

Background of the innovation

This blended learning is performed with the objectives to suits the teaching and learning among the 21st century undergraduates. The flipped classroom method was adapted as to address the fact that learning is not a one-time event but is a continuous process, and students also learn at their own pace. The role-play and presentation activities were designed to provide a platform for the students to practice their knowledge and understanding related to the topics.

Importance of the innovation to education

This innovation is importance to suit the 21st undergraduates learning style, and this is a fun learning approach in communication skills for the tertiary education.

Advantages of innovation towards education

Advantages to the student

- i. Student can learn at their own pace as they can always refer to the lecture materials from the e-learning portal, as needed.
- ii. Student can improve their knowledge, understanding and communication skills based on the lecturers' guidance and feedbacks.
- iii. Student are able to develop leadership qualities from the group work.

Advantages to the lecturers

- i. Lecturers can decrease time to deliver lectures in class and at the same time are able to discuss in more details the components of each topic.
- ii. Lecturers can evaluate students' understanding, knowledge and skills using better methods than the traditional teaching.

Students' feedback on the course

The students provided their feedback on the course via e-learning portal Positive students' feedbacks were obtained, for example "In my opinion, learning of this course is effective to improve effective communication between pharmacists and patients in order to achieve optimum therapeutic effect", "A very interesting course and give me a rough idea that what I will face in the future and the way to solve it," and "I love the way our lecturers teach us by showing some videos as example and they explained clearly about communication skills."



Acknowledgement

We would like to thank the first year of Bachelor of Science Pharmacy students (2017/18) for their active participation and commitment for the course.

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ID NO. UTEM 001	TOPIC: Engaging Gamification Mechanic Design for TVET Open Learning Platform (EG-MOOC)

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Abstract: Gamification is the integration of game-like design elements into non-game context to engage learners. In tertiary education, researchers and practitioners have been seeking for effective ways to improve student engagement and promote learning. A number of study analyses have examined the relationship between MOOC and learning engagement indicated that 25% of learner did not do activities and only 11.7% learner exceed learning goal. This study is conducted to introduce enhance model of engaging online learning using gamification mechanic in achieving MOOC TVET learning outcomes. The proposed model integrates 6 gamification elements which are Virtual Goods, Wally's Game, Trophies-Badged, Rewards, Skill Points and Peer Grading to measure learner's engagement. This research focuses on learning engagement (cognitive, behavioural and effective). 3 type of Gamification Instruction Interaction Dimension (learner-learner, learner-content and learner-instructor) are selected in this research. This study will conduct at the TVET Learner Level 6; Bachelor of Computer Science (Interactive Media) in a Technology University Teknikal Malaysia Melaka (UTeM) to examine the effects of gamification mechanics on student learning and engagement in open learning.

Key words: Gamification, MOOC, EG-MOOC, Student Engagement,

1.0 Description

Gamification mechanic design in EG-MOOC involves 3 major constructs are Learner-Instructor, Learner-Learner and Learner-Content. Within each construct has a gamification element distinct through a preliminary survey that has been answered by learners. The construct also contains an engagement element, indicator to measure and MOOC activity defined from document analysis through literature review on related research.

a. Learner-Content Interaction

Learner-Content Interaction is a learner interaction with learning materials such as lecture notes, videos and so on in MOOC. After learner completes a learning material or reviews the learning material, learner will answer the activities included in MOOC such as quiz to measure the cognitive level of the learner.

b. Learner-Instructor Interaction

Learner-Instructor Interaction is a learner interaction with a lecturer. Upon completion of the lecturer's learning session will be an assessment in the MOOC as a task to be answered by the learner. The assessment must be upload on the appointed date. If the learner submits an assessment before the date line the learner will receive Early Bird Badges. There are two assessments that have been uploaded by a lecturer who needs to be completed by the learner.

If a learner submits both assessments before date line, learner will get two Early Bird Badges with Reward Badges as top-ranking badges.

c. Learner-Learner Interaction

Learner-Learner Interaction is interaction a learner with others learner. Lecturer upload the first task activity that learner needs to discuss a topic in online forums. Learners discuss the topics given by lecturer with another learner within 20 minutes. Every online post discussion by learner will get Skill Points Badges and the highest online post will be able to get Reply Trooper Trophy. For the second task for peer grading, learner need to grade other learner assignment according to the scaled scale of 1 to 9. The highest grades learner will get the Lord Grades Trophy.

Figure.1 shows the processes gamification mechanic design in EG-MOOC.

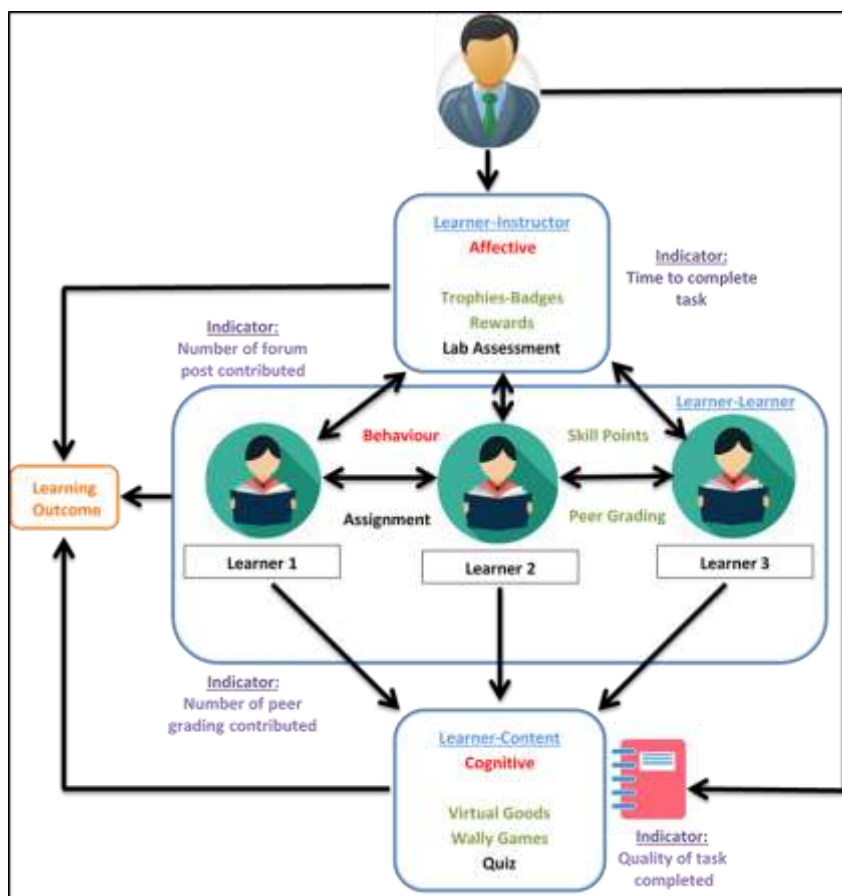


Figure 1: EG-MOOC Design

2.0 Background

The Gamification is the use of game design elements in non-game contexts (Zichermann and Cunningham 2011). It means Gamification split up serious games and design for playful interactions. Gamification has been proposed over past several years as a potential approach that can motivate and engage students in learning environment (Kappen, Deterding, and Donnell 2017)(Chauhan, Taneja, and Goel 2016)(Kapp 2012). (Dale 2014) found that gamification mechanics can be used to motivate and trigger desired behaviours on students. In the surroundings of education, gamification allows students to have immediate feedback about their progress in the learning process and acknowledgment of an accomplished task (Kapp, 2012). Despite the extensive volume of research on the engagement of students and works such as (Dale 2014) and (Ding and Orey 2018) there still is difficulty to keep students engaged in their activities.

The figure.2 shows the display of badges that need to be collected by learners and short description on the badges. There are 12 subsequent badges to complete the EG-MOOC system.

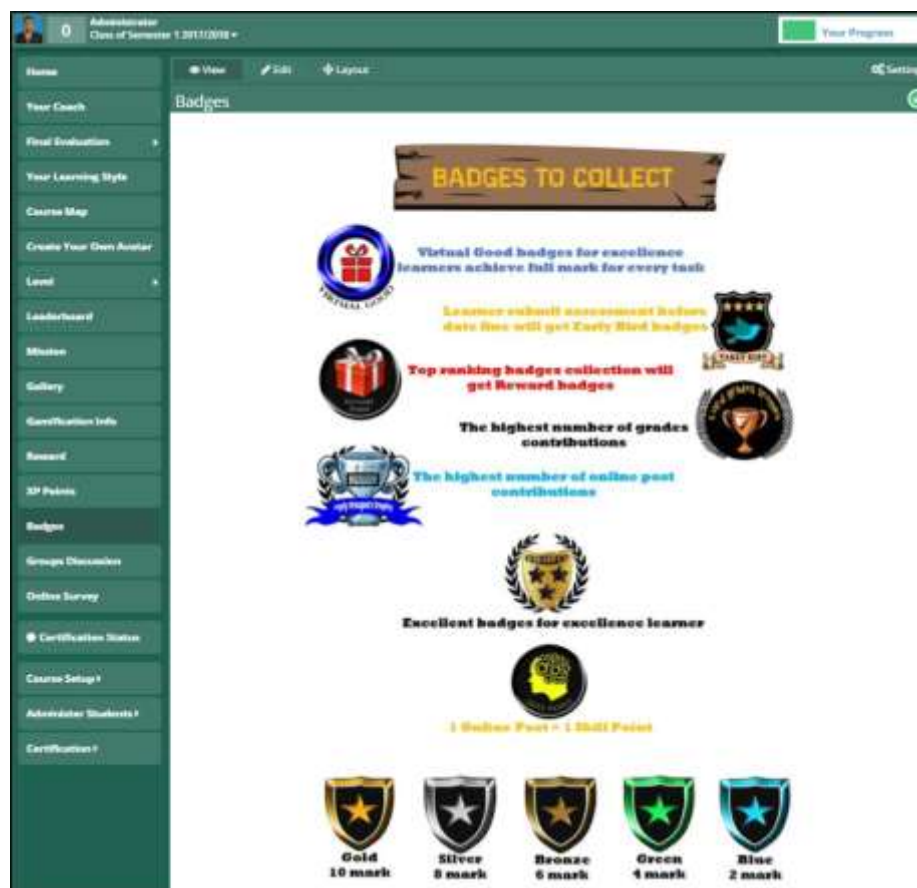


Figure 2: EG-MOOC Badges

3.0 The Importance of EG-MOOC

Gamification in EG-MOOC is significant to improve the achievement of online learning students which aims on raising the learner performance of users of a software by introducing game elements (including rewarding mechanisms) in a non-gaming context. Even though learning is known as a task that needs additional motivation from time to time, the concepts of gamification have not yet gained a foothold in the domain of learning platforms in general and massive open online courses in particular.

EG-MOOC supports students increase learner engagement towards learning, and because of the gamification elements embedded in the education setting they get pushed forwards and become more stimulated and interested to keep learning. Gamification can create a powerful boost to determine them to study more.

4.0 Advantages of EG-MOOC

a. Gamification Mechanic and Activities

Gamification mechanic design and activities in EG-MOOC system is suitable for learners TVET Level 6 through preliminary analysis.

b. Gamification Badges

There are several gamification badges in the EG-MOOC system that will be provided to learners in every activity.

c. Easy of use and handling

The EG-MOOC system is easy to use and handling by instructors and learners and is able to increase student engagement.

5.0 Commercial Value of EG-MOOC

The EG-MOOC system has been registered copyright in the Intellectual Property Corporation of Malaysia. The EG-MOOC system has been used online in the Multimedia System subject at UTeM for TVET Level 6 students. The use of gamification elements has a positive impact on the involvement of students in online learning. EG-MOOC has been expanded to TVET Level 3 students through Network Based subjects in community college. The involvement of community college students in online learning continues to increase dramatically and has a positive impact on student achievement. This EG-MOOC system can also be extended to all TVET University in Malaysia for commercialization.

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ID NO. UTEM 002
TOPIC: Gamification Leader Board Model Based on Player Type to Increase Student Engagement

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Abstract: Nowadays, the rising topic in education is about gamification. The element of game mechanics, such as points, badges, leader boards, levels and challenges are used to energize desired behaviours. Leader board is one of the popular gamification mechanics chosen by many researchers. Leader board is used to show the status for all students based on achievements. The objective of this paper is to design a more effective leader board to increase learner's engagement. To achieve the aim, a literature survey was conducted to analyse existing leader board elements applied in education. A deep search was undertaken that includes books, conference papers, journals, articles, thesis and dissertations. This study also involved 84 students from Community Colleague that contributed input for the leader board design. As a result, we determined that leader board design in a short ranking (Top 3) that tend to influence the engagement among learners. On the other hand, we also found two issues in leader board design that may fail to sustain learner's engagement. First, the leader board design must consider the types of learners. Second, the design must also consider how the leader board displays the performance rank. Then, suggestions on how to improve a leader board system are explained to propose a new model for improving learner's engagement in online learning environment.

Key words: Gamification, Leader Board, Student engagement,

1.0 Background of Study

Gamification is defined as the application of game-design elements to non-game contexts with the intention of modifying behaviour, increasing fidelity or motivating and engaging people (Deterding, Dixon, Khaled, & Nacke, 2011), by leveraging human motivations present in games, e.g. competition, rewards and socializing. Currently, gamification is an emerging trend in many application fields, including education. Many gamification initiatives use points, badges and leader boards to motivate and incant participants to alter their behaviour. The objective of this project is to design a more effective leader board design to increase learner's engagement. The research question which is going to be investigated is what are the factors that can affect leader board mechanic system implemented by means of learning engagement?

2.0 Related Works

Leader board is one of the most popular gamification elements that have been used by many researchers ((Bartel and Hagel 2014) (Landers and Landers 2014)(Staubitz et al. 2014) and (Fotaris et al. 2016). Deterding et al. (2011) defined Leader boards is a list of participants, which is ordered by the highest to the lowest achievements. The leader board can be viewed in different ways such as weekly, daily rankings or by activities. It is used to stimulate and promote competitiveness and engagement among the players participating while assessing the capability of the participants (Crumlish and Malone, 2009). Leader board is also known as score board (Monterrat et al. 2015). There are many types of leader boards used by previous researchers in online learning environment. Figure 1 shows the different types of leader boards applied in previous research.

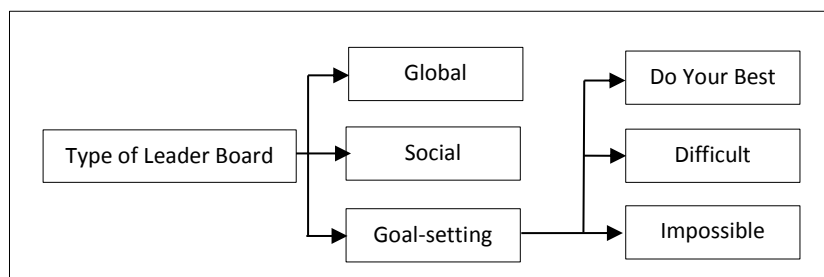


Figure 1: Types of leader boards applied in online learning

Weston et al. (2015) mentioned that leader board is used as a promoting factor in enjoyment of a system because a leader board presented the current position of a learners. However, Bartel and Hagel (2014) found that competing with other students can work well or will just have no effect on some individuals. Hence (Staubitz et al. 2017) revealed that as the users in the list have a relation to each other, the leader board gains more relevance and everybody should have the possibility to win. Hence, there is no hesitation that the practice of leader board is an approach which can motivate the students for a better performance. Daud et al. (2017) revealed that leader board is an important gamification element and preferred by students. Leader board took the second place in Top 5 gamification mechanics.

3.0 Design & Methods

A survey of the literature was conducted to explore the existing gamification approach applied in teaching and learning to enhance learning engagement. There were five steps applied in this study. Step 1 - General Database Search: A survey of the literature was conducted to explore the existing gamification approach applied in teaching and learning to increase learner engagement. A deep exploration of the academic literature was taken on using ScienceDirect (SD), Scopus, Springer, Research Gate, IEEE Xplore Digital Library (IEEE), and Google Scholar. The materials types are including conference paper, journals, reports, dissertations, articles and thesis within the year from 2013 to 2018. The following terms: gamification, leader board, learning engagement, and e-learning were used to search all materials. Step 2 - Focus Search: After gathering a few papers, the focus was on exploring existing leader board element in learning engagement and the factors effecting engagement using online learning. Step 3 – Analysis: After completing the paper review, all data were analysed using table matrix and Step 4- Designed a more effective leader board system based on findings from previous research.

A quantitative study was conducted to gain some information regarding leader board design preferences. The survey was in the form of an online Google form. The electronic survey was spread out through one of the current social media such as Facebook and Telegram which involved approaching students in computer labs and smartphones. Five-point Likert-scale items (1-2 strongly disagree; 3-4-disagree; 5-neutral; 6-7-agree; 8-9-strongly agree) are indicating for some questions such as related to Leader Board Gamification Mechanics Preferences for Mobile Learning Design. It is related to the AHP Likert scale for making decision (Saaty 2008). Based on Sample Size Table proposed by (Krejcie, R. V., & Morgan 1970), for minimum size for the population of 85 students, the minimum requisite sample size was 70 students. The total number of students from 3 Community Colleagues in Malaysia responded to this survey is 84 (33% males and 67% females).

4.0 Result & Discussion

In this study, some data related to leader board mechanics preferences for online learning design had been collected. Interesting data collected will assist us in designing an appropriate model for this research. Table 4 shows the mean ranged from 5.22 to 7.49. Based on the results, the highest mean value is 7.49 (Item 6). Most of the respondents agreed to see their achievement in the Top 3 ranking. Item 7, which had the lowest mean (5.22) revealed that there were those that agreed to see their achievement in the Top 20 ranking. Since the result is quite high for Top 20 ranking, to balance the design of the leader board we decided that in our model the leader board will display on Top 5 ranking. In addition, there's an interesting finding (Item 5) which shows mean value of 6.05. This result indicated that there's quite high percentage of respondents agreed that they feel distracted if their name were displayed at the bottom of the rank in class. All these findings support the objective of this paper that the leader board design need to be improved to keep learner's engagement.

Table 1: Leader Board Gamification Mechanics Preferences for Mobile Learning Design

No	Item	Mean	SD
1	I agree that my achievements are displayed.	5.94	2.49
2	It is necessary to know my friend's performance.	6.29	2.23
3	I think it is necessary to know my group performance.	7.06	1.90
4	I prefer to see group ranking than individual ranking.	6.61	2.50
5	I feel distracted if I see my name at the bottom of the rank in class.	6.05	2.82
6	I like to see my achievement in the Top 3 ranking.	7.49	1.90
7	I like to see my achievement in the Top 20 ranking.	5.22	2.66

Previous studies by (Dominguez et al. 2013), (Bartel & Hagel, 2014), (Ibanez et.al, 2014), (Landers & Landers, 2014b), (Monterrat et al. 2015), (Weston et. al, 2015) (Staubitz et al. 2017) and (Chernbumroong and Muangmoon 2017) had reported some issues on leader board design that can affected learner's engagement. There were two factors suggested on leader board system design. The previous studies by suggested that the leader board design must consider the type of learners because different people motivated by different kind of elements. The second issue is how the leader board displays the rank. Displaying all users in one Leader board should be avoided to keep learner's engagement and motivation.

5.0 Conclusion and Future Work

The aim of this research is to design an effective leader board that can increase student learning engagement. Therefore, to achieve research objective 1, data from documents analysis on existing leader board design to determine existing factors that affect learning engagement has been analyzed. As a result, a new leader board design is proposed to ensure equality for every student type in the evaluation system. Based on the findings, we would like to propose a new type of leader board called Leader Board Based on Player Type that aims to increase students' engagement. The new leader board model is designed based on player types. The proposed leader board will display ranking groups and will only show the top five students. The ranking is share listed to only 5 to cater the low learner's group motivation.

The new design of the leader board will provide guidelines and conceptual model for MOOC Developers or MOOC Platform Developers to implement gamification design based on player types. This innovation will improve the teaching and learning process especially TVET Level 3. In the next step, these findings provide the following insights for our future research in structuring the gamification indicator engagement to measure the learner engagement in cognitive and behavior based on learner's player type.

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ID NO. UTEM 003

TOPIC: INTERACTIVE BOOKS FOR ENGINEERING

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Abstract: In this Industrial Revolution 4.0, the digital technology has played its important role in shaping the the education. Digital technology for teaching and learning materials improves progressively, and the implementation is now taking place especially for engineering subjects in the universities in Malaysia. In this paper, we discuss the perception of students on the digital interactive books—iBooks (for the Apple iPad and iPhone)—we created for undergraduate engineering students in Universiti Teknikal Malaysia Melaka (UTeM). The findings demonstrate that students can learn the engineering subject better with the iBooks and they want to spend more time with iBooks to learn independently. The latter finding is important for the implementation of flipped learning pedagogy in the university.

Key words: *iBooks, engineering, learning*

Introduction

Today's students are completely engaged with technologies. They interact with the world through smartphones, computers and tablets. If in the previous decades the teacher is the source of knowledge, now the sources of information and knowledge are available at the finger tips. As such, the learning styles and the needs of the student in this 21st century must be accommodated.

Keane et al. (2012) reported that the use of iPad and Netbook influenced and enthused teachers and students, allowing more student-centred pedagogies to be developed, improving communication and literacy of students. However, dedicated teachers are important and they must be prepared to shift into the technological-based pedagogy.

The conventional didactic lectures especially in the university (where the students are adult learners) is now questionable in terms of its effectivity to transfer knowledge, and thus various pedagogies are gaining popularity, for example problem-based learning and flipped learning (Begmann and Sams, 2012; Keane et al., 2012). In particular for the latter, use of digital technology is crucial to ensure the self-learning (at home) happens and to keep the students engage with the subject. Interactive content is therefore necessary.

One of the digital technologies which provides interactive media is iBooks from Apple. iBooks is an interactive book which can accommodate not just pictures, but also videos, HTML animations and 3D images integrated in 'one book'. Students can highlight the texts, create notes, and can directly share the thoughts with peers. iBooks also has accessibility features which allows the book to also be accessed by the blind impaired student. The iBooks can be just a substitution of a normal pdf e-Book if it is not properly designed, especially if the interactivity elements are not fully utilised. iBooks must designed to redefine the student's learning.

A study conducted on the student's performance in Biology subject indicates that: (i) students using iBooks had significantly higher post test scores when compared to their peers using printed books, (ii) students using iBooks showed gains in achievement over the course of the year, while those using printed books shows significant decrease in achievement, and (iii) students using printed books experienced a decrease in motivation score, while the score of students using iBooks remained the same (FLN, 2018). There is still a lack of research about the impact of iBooks on learning, particularly for engineering subjects. This paper is aimed at contributing to the preliminary study on the impact of iBooks for undergraduate students in our university.

Methodology

Development of iBooks

We created two iBooks for undergraduate engineering subjects, namely Mechanical Vibration (3rd year students) and Multimedia Signal Processing (4th year students). We consider two main factors in developing the iBooks, i.e. design and interactivity.

Design - The aspect of design is rarely taken into consideration by lecturers and teachers when developing the teaching slides or lecture notes; documents used as the main learning materials by students. Design here is not only about the content, but merely on the visual appearance of the document which affects the visual communication with the reader. As pointed out by Norman (2015), "Attractive things make people feel good, which in turn makes them think more creatively...positive emotions are critical to learning, curiosity, and creative thought"

We adopted some basic principles in our iBooks, namely contrast, alignment, proximity and generosity (Reynolds, 2014). The default templates in iBooks Author actually apply these principles implicitly. Figure 1 summarises the application these design elements in our iBooks.

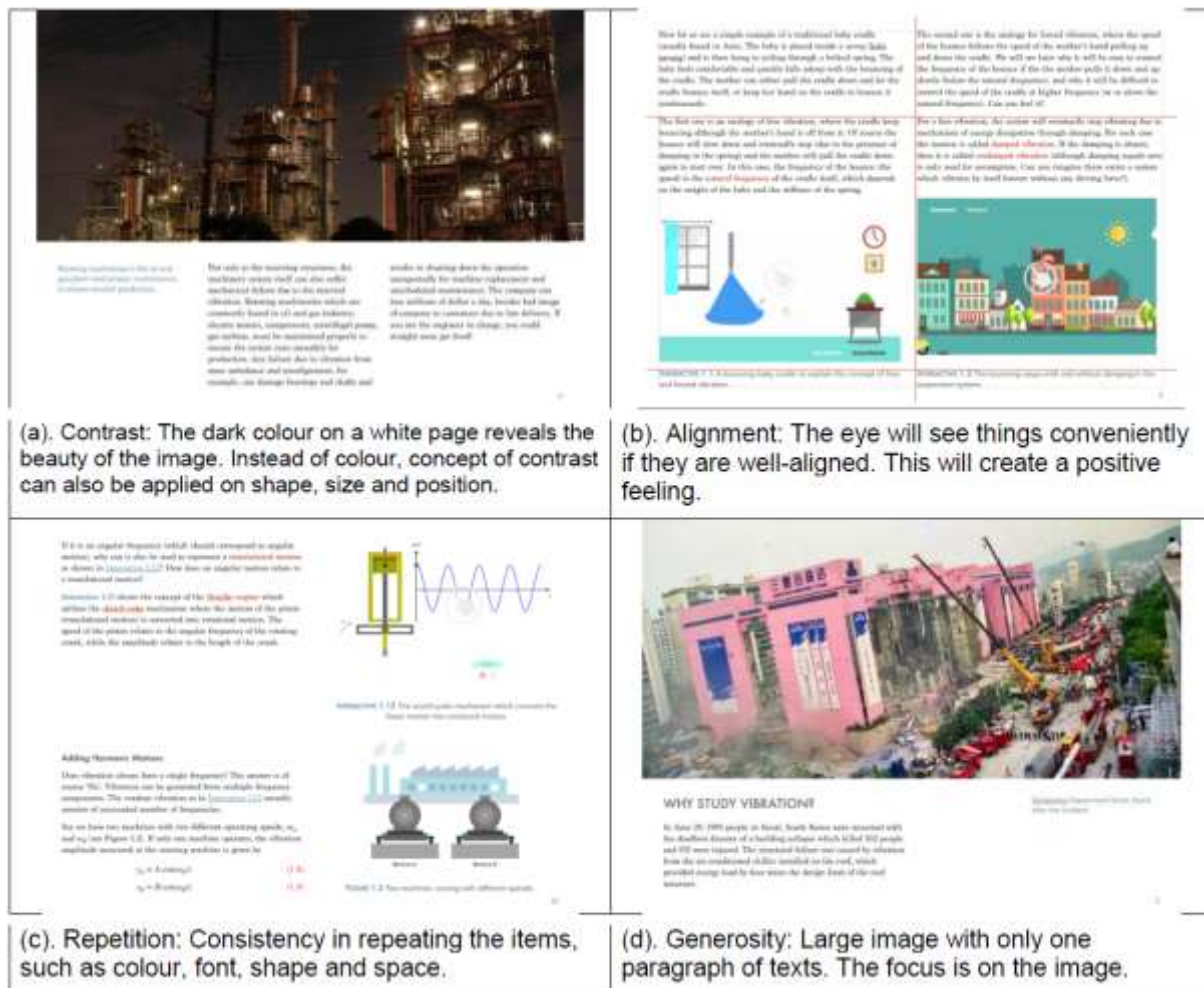


Figure 1: Examples of pages in the iBooks applying the principles of design.

Interactivity - In engineering subjects, many physical phenomena involved. Interactive elements to visualise the phenomena are thus required for student to better grasp an engineering concept. Thanks to iBooks where the element of interactivity can be integrated such as videos, keynote and HTML files.

In Mechanical Vibration subject where dynamic movement is involved, interactive elements are thus important. Figure 2(a) shows the example of interactivity in iBooks of a Bourke's engine to explain the scotch-yoke mechanism which visualises the process of converting the translational motion to rotational motion. The speed of the piston can also be changed by tapping a button. Figure 2(b) shows example of digital sampling in image processing. The image of Mona Lisa for correctly sampled or undersampled is shown by swiping the image right and left.

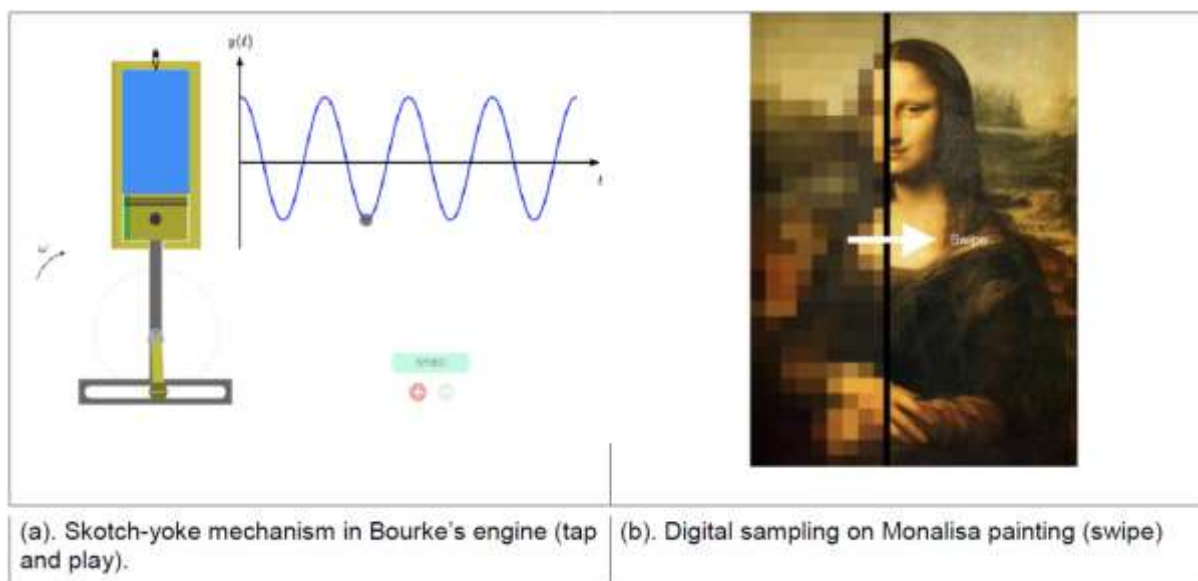


Figure 2: Examples of interactivity in our iBooks.

Survey

The survey was taken after the semester was over. This involves 15 third year students taking subject Mechanical Vibrations (BMCM3743) in Faculty of Mechanical Engineering and 48 fourth year students taking Multimedia Signal Processing (BMCT8393) in Faculty of Electrical and Computer Engineering. For the former, the students used iPhones to read the iBooks, while for the latter, the students used iPad in the classroom. The following are the questions in the survey:

- What is the common learning materials for you to learn at home?
- With Text Book, Power Point Slides or Modules, do you think that you can learn yourself easily?
- According to you, what is the main problem with the current learning materials?
- For Flipped Learning, what is the tendency that you will study at home before coming to the class?
- Do you find my iBooks interactive and engaging? How would you rate?
- What is the most engaging feature of my iBooks?
- Did my iBooks change your feeling about Engineering subject?
- Do you feel that using iBooks you can learn Engineering subject better?
- Do you feel that you want to spend more time studying at home with the iBooks?

Results and Discussion

Figure 3 shows the response from the survey about the conventional teaching materials, namely text book, power point slides or modules. Some materials are available to student in soft copy forms (pdf files, ppt files). Most of the students from two classes study outside the class using the teaching module consist of example questions and solutions, which indicates that student most likely prefer to do the exercises on solving problems at home to understand the theory taught in the class.

Almost half of the respondents say they are not sure or cannot learn by themselves outside the class using these materials. The most reason is that the material is a static material which cannot visualise any physical phenomena in Engineering. This could lead to deficiency of student's motivation in self-study (Norman, 2015).

The indication is further strengthened in the last chart where more than half of the students shows low tendency (ratings 1-3 out of 5) that they will conduct self-learning using the conventional materials. The self-learning (learning the material at home) is one of the key successes of flipped classroom or flipped learning.

The response concerning the iBooks are shown in Figure 4 & 5. Almost all students (84%) find that the iBooks are engaging, where the animation feature (with tap and play) is the most engaging part. Animated graphics can improve the cognitive aspect of learning and thus it has to be properly designed (Lowe, 2001; Lowe, 2003). Students learned better of complex computer algorithm using animation (Byrne, 1999). The same was also found in teaching, where animated learning materials were more useful to undergraduate computer games students than traditional learning materials for learning mathematical concepts (Taylor et al., 2008).

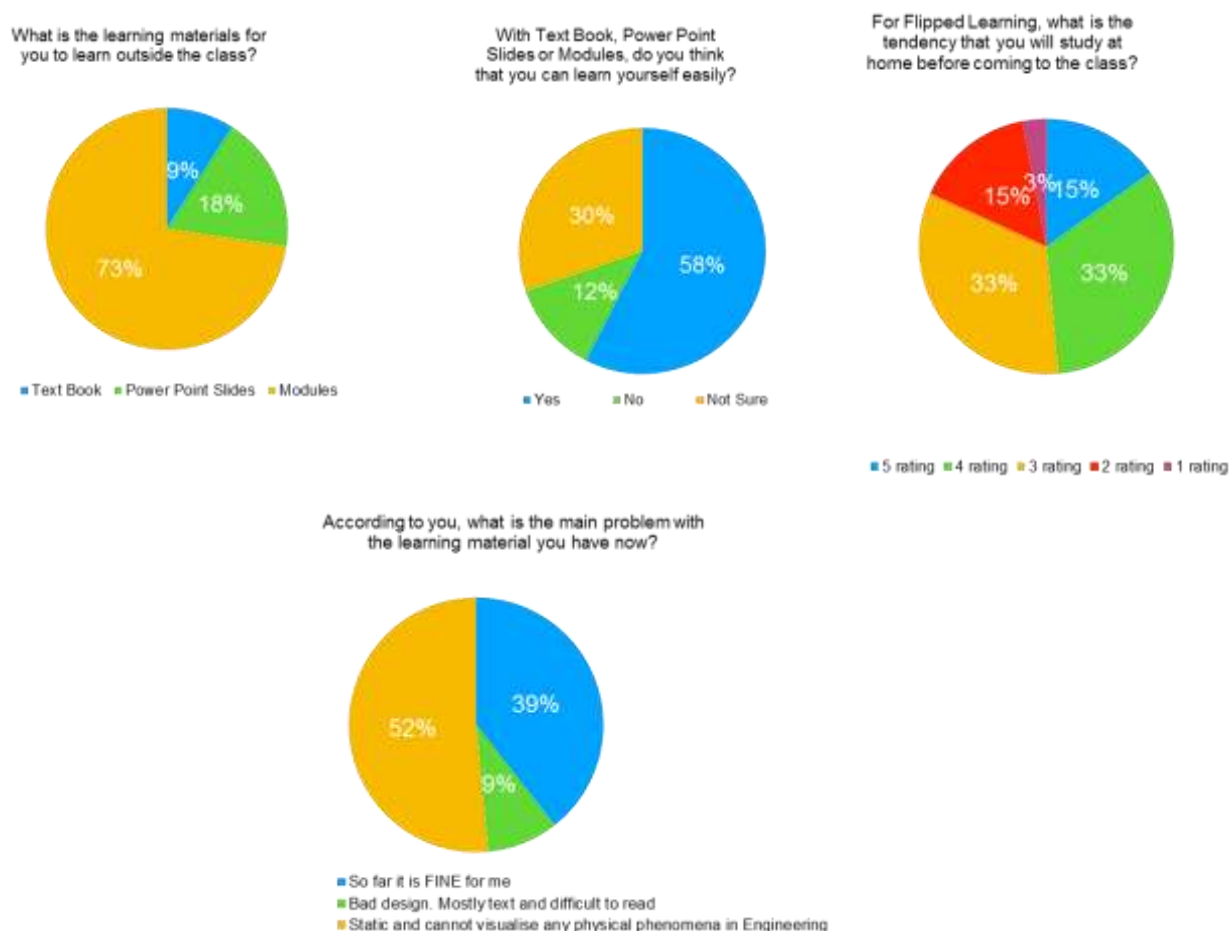
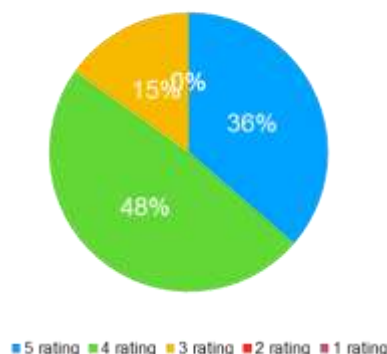


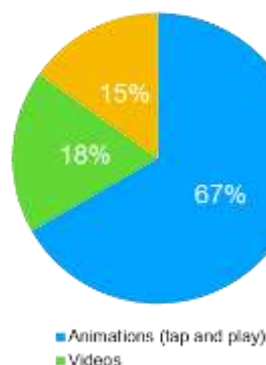
Figure 3: Response relating to common learning materials other than iBooks.

All students also find that they can grasp the engineering concept better with iBooks. And most importantly, 74% of students think they spent more time with the iBooks. Because the process of remembering and understanding (the lowest part of bloom taxonomy) has been catered outside the class, the higher part of the bloom (applying, analysing, evaluating and creating) can be focused in the class (flipped learning) (O'Flaherty and Phillips, 2015). It was suggested that the format and structure of learning materials in the flipped classroom contributed significantly to the student's satisfaction with their flipped learning experiences (Hung, 2014). For this purpose, the iBooks can be a suitable choice among any interactive media.

Do you find my iBooks interactive and engaging? How would you rate?



What is the most engaging feature of my iBooks?



Do you feel that using iBooks you can learn Engineering subject better?

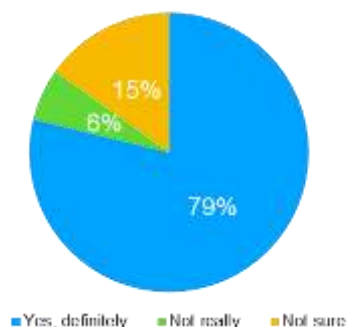
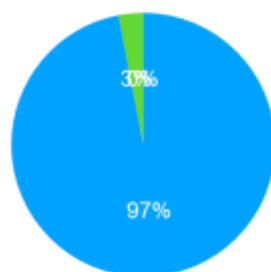


Figure 4: Response of students relating to iBooks.

Did my iBooks change your feeling about Engineering subject?



Do you feel that you spent more time studying outside the class with the iBooks?



Figure 5: Response of students relating to iBooks.

Conclusion

Survey on the perception of iBooks has been done. The main findings reveal that students can learn better with iBooks to grasp the concepts in engineering and they want to spend more time to study outside the class, which is important for the implementation of flipped learning. Again, the impact of iBooks depend on how the author design the content, i.e. by optimising its interactive features. Otherwise the iBooks is just a substitution of digital e-Book. The long-term study of its impact on student's learning can be further conducted by analysing the student academic performance with and without the iBooks.

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ID NO. UTEM 004	TOPIC: An Adaptive Self-Assessment Model for Improving Student Performance in Language Learning using Massive Open Online Course (MOOC)

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Abstract: Massive Open Online Course (MOOC) provides an effective learning platform with various high-quality educational materials accessible to learners from all over the world. On the other hand, assessment plays an important role to improve student performance in MOOC learning. However, issues in assessment designs contribute to lack of student engagement. Hence, a suitable assessment model should be developed to improve student performance in MOOC learning. This study proposes an adaptive self-assessment model based on learner characteristics to improve student performance in language learning using MOOC. A literature review was performed to identify existing learner characteristics, functional features in assessment and elements of learner characteristics. Four research questions have been constructed to assist the study. Results of the study are then used in formulating a conceptual model for an adaptive self-assessment based on MOOC functional features, and elements of students learning styles & cognitive styles. Based on the conceptual model, an adaptive self-assessment model for language learning was produced to build a complete learning design for Mandarin MOOC. The model was validated by two Subject Matter Experts (SMEs) and two Instructional Design Experts (IDEs) whom contributed in the production of the complete learning design. Findings of this study are two folds: i) a conceptual adaptive self-assessment model based on learner characteristics for improving student performance in MOOC learning, and ii) an adaptive self-assessment model based on learner characteristics to improve language learning using MOOC. The proposed models are meant to guide MOOC developers in assessment design. A complete learning design for Mandarin MOOC that applies the proposed model has also been developed.

Key words: Adaptive, Self-Assessment, Student performance, Language, MOOC.

1.0 Background of Study

Researcher highlighted, in MOOC assessment there is a big challenge for the large number of students to get detailed and timely feedback (Wong, 2016). The limitation of experiential learning and many high-impact practices in higher education is lacking of assessment for embedded learning outcomes at the individual learner level (Heinrich & Rivera, 2016). Taras (2010) also highlighted that Self-Assessment has been shown to support student learning.

Using MOOC, student learning time involves more independent learning time than guided learning time. In MOOC learning, student independent time will involve self-study time which mainly requires self-assessment. Therefore, there is a need for a self-assessment model that can be used to guide MOOC developers in assessment designs to give continuous improvement to students in MOOC learning.

This study aimed to propose an adaptive Self-Assessment model for improving student performance in language learning using Massive Open Online Course (MOOC) and the research questions were constructed as follows:

- (i) What are the existing functional features for assessment in MOOC platforms?

- (ii) What are the elements for each dimension of learner characteristics?
- (iii) How to design MOOC activities that incorporate elements for each dimension of learner characteristics?
- (iv) How to design MOOC activities that incorporate assessment functional features?

2.0 Related Works

Researcher highlighted, in MOOC assessment there is a big challenge for the large number of students to get detailed and timely feedback (Wong, 2016). The limitation of experiential learning and many high-impact practices in higher education is lacking of assessment for embedded learning outcomes at the individual learner level (Heinrich & Rivera, 2016). According to Taras (2010), Self-Assessment has been shown to support student learning. The author mentioned that the term 'Self-Assessment' is used to cover all judgements by learners of their work which subsumes terms such as (i) 'self-evaluation' and (ii) 'self-appraisal'. Traditionally, models used for adaptive assessment have been mostly summative: they measure or rank effectively examinees, but do not provide any other feedback (Vie et. al., 2017).

Liebetrueth (2017), mentioned that, assessment model has to cover the (i) aspects structure (framework within which the content has to be filled in), (ii) content (criteria that separate a good and a poor execution of the focal function) and (iii) method of the assessment process (process how a maturity assessment is conducted). Taras (2010) (2015) and (2016) classified self-assessment models into three classification with five models : (i) weaker (self-marking, sound standard), (ii) median (standard) and (iii) stronger (self-assessment model with integrated peer/tutor feedback, Learning Contract Design). In this study, the stronger self-assessment type 4 models, which is self-assessment model with integrated peer/tutor feedback, has been chosen as a model to improve student performance in language learning using MOOC platform.

3.0 Design & Methods

This study involves four phases: (i) literature review, (ii) analysis, (iii) design & development and (iv) evaluation.

Literature Review: The study was initiated by conducting literature review to find answers for RQ1 and RQ2 of the study.

Analysis: Analysis of RQ1 results tabled out the existing functional features for assessment in MOOC platforms. Meanwhile, results of RQ2 analysis listed the elements for each dimension of learner characteristics.

Design & Development: Based on findings from the analysis phase, RQ3 and RQ4 are then used to guide the researchers in proposing a conceptual model of self-assessment that is adaptive to learner characteristics to improve student performance. By applying the conceptual model, the researchers built a draft learning design for a Mandarin MOOC.

Evaluation: Two Subject Matter Experts (SMEs) in Mandarin language and two Instructional Design Experts (IDEs) participated actively and played important roles in applying, improving and verifying the adaptive self-assessment model that was used in producing a complete learning design for teaching Mandarin language via MOOC. Based on the expert feedbacks', few minor structural changes were made to improve and finalize the model construction.

4.0 Result & Discussion

In this section, the results of the analysis and design phases are presented and discussed based on the research questions.

RQ1: What are the existing functional features for assessment in existing MOOC platforms?

Five popular MOOC platforms were analysed to find existing functional features for assessment. Results of the analysis show that Open Learning has the most assessment features required on a MOOC platform. However, Open Learning is as placed as the second top based on the average score for 10 requirement assessment features on a MOOC platform. In order for us to do further study, we focused on two assessment features that are provided by our chosen MOOC platform which is Open Learning. The two features are (i) hints and (ii) interactive exercises. The choices are supported by S. Y. Chen & Yeh (2017) who highlighted that hints are used to support students to learn academic and Zhong et. al. (2017) also highlighted that interactive is the support methods to increase students' understanding of difficult concepts in online education. Meanwhile, many learners also indicated that instructors needed to be more involved, interactive, and responsive in the online course (Howell et. al, 2006).

RQ2: What are the Elements for Each Dimension of Learner Characteristics?

According to Park et. al. (2015), learner characteristics are important in all forms of online learning. Lever-Duffy & B.McDonald (2009) listed three types of learner characteristics that are effective factors for student learning: (i) learning style; (ii) cognitive style and (iii) multiple intelligence. In this study, the researchers have focused on learning styles and cognitive styles only. The findings of the first literature study, there are 29 existing elements in 8 dimensions of learning styles: Active, Reflective, Sensing, Intuitive, Visual, Verbal, Sequential and Global. Based on findings of the second literature study, there are 27 existing elements in 8 dimensions of cognitive styles: Extrovert, Introvert, Sensing, Intuitive, Feeling, Judging and Perceiving.

RO3: How to design MOOC self-assessment activities that incorporate elements for the selected dimensions of learner characteristics?

To answer RQ3, the researchers focused on designing MOOC self-assessment activities for two selected dimensions of learning styles and two selected dimensions of cognitive styles. The chosen dimensions were made based on findings of our preliminary study (H.Hashim et.al, 2017) on 50 students using Felder and Silverman Learning Styles Model and Ancona et.al (1997) cognitive styles questionnaire. Once the dimensions have been determined, the MOOC topic learning outcomes were used as guidance in selecting which types of MOOC self-assessment activities can be incorporated with which learner characteristic dimensions. Finding shows the dimensions of learner characteristics that can be adapted into potential MOOC self-assessment activities to improve student performance in language learning using MOOC. Then, the results of further analysis on each question/item in self-assessment activities for each element in learner characteristic dimensions are specified.

RQ4: How to design MOOC self-assessment activities that incorporate assessment functional features?

In order to answer RQ4, the researchers focused on designing MOOC self-assessment activities using selected MOOC functional features that are suitable for a particular learner characteristic dimension. As mentioned earlier in sub-section RQ1, two assessment functional features were selected to be focused in this study: (i) hints and (ii) interactive. Finding shows the assessment functional features that can be adapted into potential MOOC self-assessment activities in order to improve student performance in language learning using MOOC platform.

Based on findings from RQ1, RQ2, RQ3 and RQ4, the researchers proposed a conceptual model for an adaptive self-assessment model based on learner characteristics that can be applicable by other

MOOC developers and MOOC platform developers. Figure 1 show the proposed adaptive self-assessment model based on learner characteristics to improve student performance in language learning using MOOC. In this model, MOOC self-assessment activities are adaptive to learner characteristics by using functional features in MOOC platform.

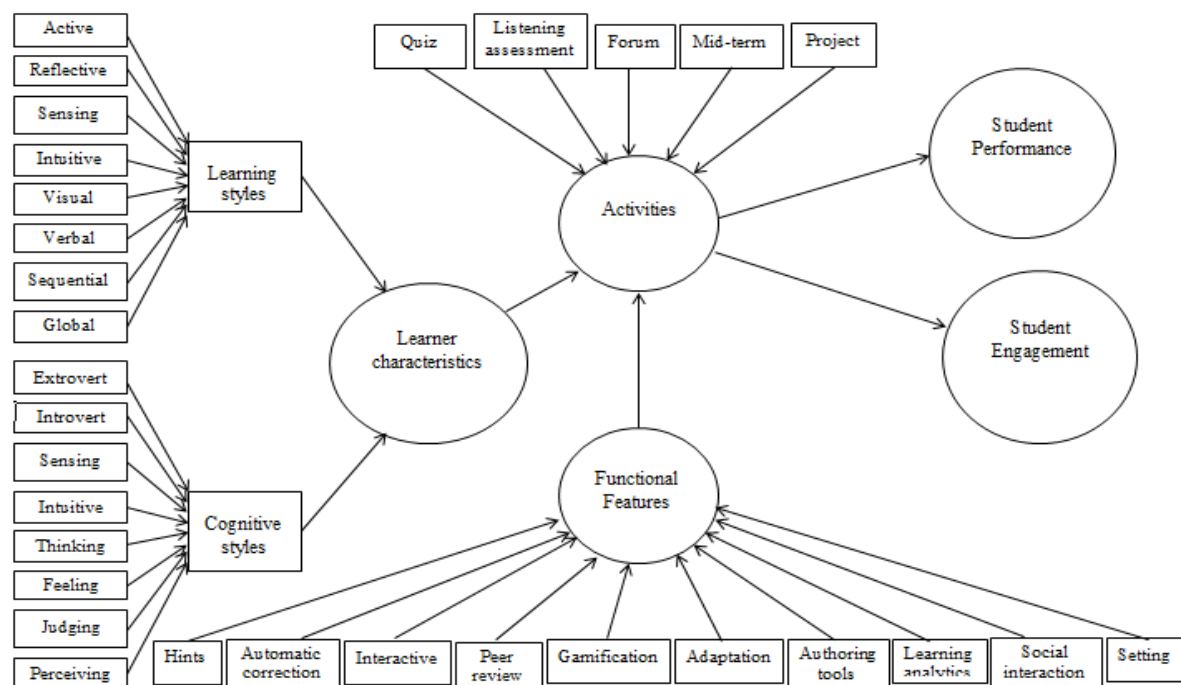
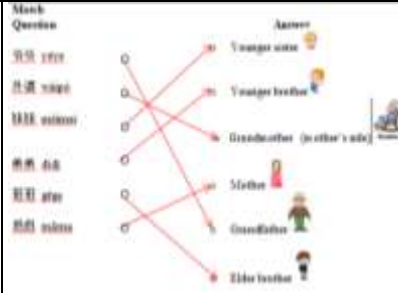


Figure 1: A Proposed Adaptive Self-Assessment Model for Improving Student Performance in Mandarin Learning Using MOOC

In this study, the researchers proposed a storyboard template that consists of 4 elements: (i) Assessment types: formative or summative, (ii) Domain of Learning: affective, cognitive or psychomotor, (iii) Self-Assessment Activities: quiz, listening assessment, forum, project or assignment, and (iv) Indicators: marks, no. of views, no. of comments or time spent. In addition, for each question in a self-assessment activity, the researchers proposed another 4 elements: (i) learning outcomes (LO), (ii) questions, (iii) functional features and (iv) item design. Table 1 shows an example of a storyboard for a quiz question with LO 3 in Lesson 6.

Table 1 : An Example of a Storyboard for a Question in a Self-Assessment Activity

LO/CLO	Question	Features	Item Design
Lesson 6			
LO3/ CLO2 Identify how to address family members.	Quiz 2 Match the Chinese characters with the correct meanings.	Hints - Text (Hanyu Pinyin) -Graphic	Interactive - Match - Drag & drop 

5.0 Conclusion

This study presents the findings on the development of an adaptive Self-Assessment model based on learner characteristics for improving student performance in language learning using MOOC. The formulation takes account learning styles and cognitive styles to be adapted into the learning design of Self-Assessment activities in language learning using MOOC. The framework also incorporates the roles of SMEs and IDEs to ensure the proposed model is practical and applicable.

This study listed three contributions to education and developed:

- (i) Provide guidelines for developing adaptive Self-Assessment in language learning using MOOC.
- (ii) Provide conceptual model in assisting MOOC developers to develop adaptive Self-Assessment.
- (iii) Provide learning design in assisting MOOC developers to develop adaptive Self-Assessment.

However, four commercial value for this study are listed:

- (i) A novelty idea on the use of learner characteristics in designing MOOC adaptive self-assessment model.
- (ii) Designed and enhanced technical MOOC assessment design (e-activities) based on learner characteristics and assessment functional features.
- (iii) Design and approach adaptive MOOC Self-Assessment activities in case study.
- (iv) Design and proposed conceptual adaptive Self-Assessment model.

In future, student performance and engagement will be investigated using that adaptive MOOC Self-Assessment model.

Acknowledgement

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ID NO. UTEM 005	TOPIC: DESIGNING AN ENGAGING TECHNICAL MOOC USING WEARABLE TECHNOLOGY

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Abstract: The low completion rate issue in MOOCs has become one of the main highlights by researchers. It is reported that only 10 to 15 per cent of the students are able to complete the MOOC courses. This low completion rate is due to the students are less engaged with the MOOCs content causing them to demotivate to complete the whole MOOCs. Engaging students in MOOCs environment especially for non-technical subjects was suit very well. However, for a technical MOOC it involved significant challenges because technical MOOCs must be able to offer the students with practice-oriented learning outcome in-order for the MOOCs to be effective and engaging. Due to the above issues, this study present and propose a technical MOOC learning design to engage students in technical MOOC with the intervention on the use of wearable technology. The aim of this study is to evaluate the students' perception on the use of wearable technology to improve student engagement in technical MOOC environment. We examine the students' perception by identifying the relationship between wearable technology variables and student engagement variables. We employed a quantitative methodology and used online questionnaire as a method of data collection. There is a total of 382 technical students participate in this study. Statistical based analysis approach is used to analyse the data. A discussion on the e-content and e-activity of the technical MOOC learning design also presented in this study. The results revealed that all smart glasses variables contribute positive relationship with student engagement variables which reflects that students are positively engaged with the learning process when using wearable technology.

Key words: *wearable technology, MOOC, students' perception, quantitative analysis.*

Content

One of the key concern of MOOCs as reported by Hew (2015) and Thanasis, Roxana, Fatos, & Santi (2013) in their study is a high learners' dropout rate. The study also highlighted on several sources indicating that only 5 per cent to 15 per cent of MOOCs participants able to finish the courses on average. The low completion rate in MOOC is a result of lack of enthusiasm in the course engagement to motivate the learners toward participation in the learning. Underpinning MOOC high dropout rate and retention issue, few solutions by previous studies suggested MOOC improvement from the pedagogical criteria (Spyropoulou, et al., 2014; Gamage, et al., 2015; Formanek, et al., 2017), technical criteria (Garcia, et al., 2014; Yousef, et al., 2014; García-Peñalvo, et al., 2017). Under the same context, few other studies suggested inclusion of additional engaging online elements, such as gamification (Vaibhav & Gupta, 2014; Gené, et al., 2014; Furini, 2016), animation (Gütl, et al., 2014; Ward, 2016; Nordin, et al., 2016), and media social (Ventura, et al., 2014; Ostashewski, et al., 2016) in order to engage and motivate the students more towards the learning process.

Engaging students in MOOCs environment, especially for non-technical subjects, was suit very well. However, there are few challenges for all educators in creating effective and engaging technical MOOCs. This is because technical MOOCs must able to offer practice-oriented learning for the MOOC

course to be effective and engaging (Garcia, et al., 2014; Buchem, et al., 2015; Alcock, et al., 2016; Douglas, et al., 2017). Due to this issue, the main target of this study is to improve student engagement with the technical MOOC using wearable technology. Several researches in the field of application of wearable technology in education highlighted the below advantages of wearable technology (Parslow, 2014; Paro, et al., 2015; Evans, et al., 2016; Lee, et al., 2017; Ortensi, et al., 2017):

- Eases the video editing process, as the video being captured directly from the wearer's view-point. This can save time and cost of video editing;
- Able to offer better visualization of the operative field;
- Connectivity ability - very essential for sharing operation, in person training and real-time tele-proctoring of surgery. Video captured by can be streamed via wireless Wi-Fi and Bluetooth to distant mobile device or monitor, could be cast for web in real time;
- Allows two-ways communication;
- Voice command function - allows surgeon to control device without contaminating touch during the whole procedures;
- The most convenient and lightweight device for wearing and holding throughout the long operation time;
- Microphone and speaker system allow surgeon to communicate with the other person wherever they are. It can be operated by the touch and gesture of head as well, which allow more input source; and
- Video quality and resolution from the camera are enough to describe or record usual procedures/ activities.

This study discussed in detail the application of wearable technology in developing an engaging technical MOOC course by proposing a technical MOOC learning design structure that consist of the e-content and e-activity. A technical MOOC course also has been developed based on the proposed model. The objective of this study is to evaluate the students' perception on the use of wearable technology to improve student engagement in technical MOOC environment. We examine the students' perception by identifying the relationship between wearable technology variables and student engagement variables. We employed a quantitative methodology and used online questionnaire as a method of data collection. There is a total of 382 technical students participate in this study. A correlation analysis was used to identify the positive or negative relationship between wearable technology variables and student engagement variables. Table 1 revealed the results of the correlation analysis. The results revealed that all smart glasses variables contribute positive relationship with student engagement variables which reflects that students are positively engaged with the learning process when using wearable technology.

The proposed technical MOOC learning design structure can servers as a guideline for MOOC developers, which are the educators and business partners, to produce an effective and engaging MOOC learning especially for technical courses using wearable technology.

Table 1: Formatting used in heading paragraph formats, table and figure.

Student engagem nt	Wearable technology				
	FP	RA	RT	SA	N
CE	0.4780**	0.479**	0.428**	0.646**	0.366**
BE	0.646**	0.632**	0.602**	0.646**	-
AE	-	-	0.622**	-	-

** Correlation is significant at the 0.01 level (2-tailed).

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ID NO. UTEM 006
TOPIC: A Gamification Design to Support Students' Intrinsic Motivation to Completing Courses in MOOC Platform
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Abstract: The growth of the digital industry encourages education professionals to play a role in thinking about how to transfer knowledge easily and fun. However, some issues need attention, especially in the low rate of learners who want to complete online courses. A gamification approach has been used primarily in online-based learning. On the other hand, gamification is also considered to have created new problems in student motivation if it is not designed and planned properly. To address this problem, a new framework and design of Learning Management System (LMS) is proposed. The methodology includes systematic literature study, framework formulation, design and development and expert evaluation. The aim is to formulate an LMS model that is effective, in line with expectation and would enhance student's intrinsic motivation. The proposed LMS is built based on our gamification framework which prioritises the provision of four primary factors, namely; i) provide learning through meaningful learning instruction, ii) raises retention through teamwork and relatedness to shape social identity, iii) provide students autonomy to choose their destiny and learn from failure, and iv) offer challenges and achievement to support competence & mastery. The framework was evaluated by panel of experts in games & e-learning. As a contribution, this study presented a new framework and an LMS architecture that emphasise in enhancing the intrinsic motivation of learners to complete the courses being taken and get a more interactive, exciting and different learning experience.

Key words: *Gamification, Design, Students' Intrinsic Motivation, MOOC Platform.*

Description of Innovation

The G-MOOC Platform builds upon the gamification model that is compiled and proposed based on various aspects of both the Interactive learning environments (learner to contents, learner to learner and learner to instructor interaction) and the game elements resulting from the literacy review process. Based on these approaches, a gamification-based MOOC platform was established to increase the learner's interest in completing the course.

As with Learning Management Systems (LMS), we provide features for instructors to build courses. What is different is that we use naming on features adapted to the story of heroes' journey that is adapted from the game world. Each class we call the Heroes Trials, in each heroes' trial there is a weekly meeting which we call a quest, and in each session, there is a sub-meeting which we call path. The aim is to give the impression of adventure for learners when they take courses provided by the instructor. Regarding learning content, our platform supports content features for text and video material, quizzes with multiple choices and true & false models. There are also forums for discussion that involves instructors and learners.

In the gamification design that we propose, there are various game elements used, including avatars (The Knight, The Priest and The Sorcerer), Player levels, Skill Trees for each avatar, Interaction with other lines through collaboration and competition, Utilization of various types of points from Base Experience Points (BEP), Heal Points (HP), Skill Points (SP), Gold Points (GP) and Extol Points (EP). There are also leaderboards elements to display the greatest number of BEP players globally, as well as in each heroes' trials. From GP and EP that have been obtained by a learner can be exchanged for various types of different armour. We also provide a virtual map that gives learners the autonomy to determine which paths to go through and work first on every quest they follow. With that, the learner can decide for

themselves how to complete the course they follow. The gamification design that we propose is shown in Figure 1.

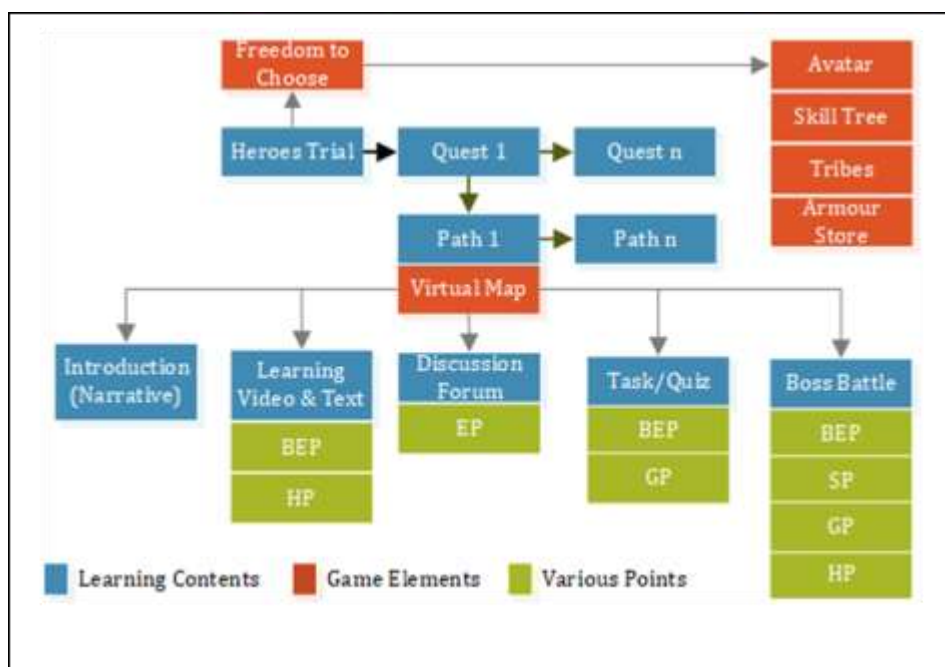


Figure 1. The Gamification Design in MOOC Platform

Background of Innovation

Massive Open Online Course (MOOC) is one of the online learning methods that has become a trend lately. Currently at least one MOOC has been published by 800 universities in various parts of the world (Shah, 2018). According to Porter (2015), MOOC is considered to provide a real contribution to education equity and make it easy for anyone who wants to learn a learning material through an online course without any limitations on distance and time to study. However, despite this, there are still various obstacles faced by instructors and providers of MOOC, especially in maintaining learners in taking courses and completing the course (Wu & Gao, 2018). Boredom and monotony influence the leading cause of the low level of completion of the course in taking courses offered. Because most existing MOOCs only apply the conventional learning model mechanism that still provides material in the form of text, audio and video (Miller, 2013).

The game element has its appeal to tie players to stay afloat and finish the game. The use of game elements in non-game contexts is called gamification (Deterding et al., 2011). Gamification is one approach that has been used by researchers to solve the problems of learning motivation in online learning (Lee and Hammer, 2011; Nah et al., 2015; Domínguez et al., 2013; Bellotti et al., 2013), but with a less precise design it can cause learners to lose their learning motivation (Gütl et al. 2014). The poor design uses game elements, and the lack of interactive content provides a gap for students' interest in completing the course. (Kalogeraki, 2016).

The Importance of Innovation for Education

21. For instructors to manage learning material, interact with learners and monitor learner activities easily.
22. For Learner to provide different learning support and experience to increase learning motivation and course completion through meaningful learning, autonomy, relatedness and competence to mastery.

Advantages of Innovation for Learners

The LMS emphasises on increasing the motivation of students to complete the course followed by providing a more interactive learning experience, with different presentations through meaningful learning, availability of autonomy for students to achieve goals through their chosen paths, collaboration

and competition and support for competencies for mastery. With that, learners do not feel compulsion when taking courses and feel challenged to complete the course. The technical guidelines from the framework shown in table 1.

Table 1. Technical Guidelines

MARC Framework	Gamification Design
Provide learning trough meaningful learning instruction.	- Using a story or narrative models like "the hero's Journey". - Use multiple paths on the virtual map to give students the freedom to choose which submodules will be completed first
Raises retention through teamwork and relatedness to shape social identity	- Provide positive feedback for each action in the discussion forum (Extoll Points) - Use learner performance to improve their social status - Provides ease in self-expression through avatars - Build relationships with teamwork (Tribe)
Provide students autonomy choose their own destiny and learn from failure	- Provides freedom to the learner to choose which path or task to complete first. - Provide an opportunity for students to learn from failure when following the quiz - Provide an opportunity for students to learn from failure when following the quiz or final exam
Provide Challenges and achievement to support competence and mastery	- Build learner emotional involvement through the challenges provided in each quest through each path so they can gain meaningful experience in learning. - Provide a dashboard for learners as well as instructors as a medium to show progress events and facilitate the measurement of performance that is running or has been passed (Performance Graph and leaderboards). - Provide element transaction through gold points that have been obtained by students to buy new armour (Armour market). - Give Positive feedback for every action performed by the learner, both for the individual and in the social environment. (Base experience points, gold points, skill points, heal points). - Give feedback for every action performed by the learner, both for the individual and in the social environment.

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ID NO. UTEM 008	TOPIC: Measuring Affective Domain in Programming Technique Course using MOOC

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Abstract: This study evaluates the affective domain of students learning Programming Technique course that have at Universiti Teknikal Malaysia Melaka (UTeM). This course is taught using blended learning approach where the sources is put on Massive Open Online Courses (MOOC). For the chosen topic, the students have undergone self-learning process without going to the classroom. Samples were asked to use a questionnaire instrument for assessing attitudes and behaviours. Results of the study indicate that development of MOOC provide a holistic element that will produce students with excellent academic achievement and good behaviour. The study also proposed a MOOC development life cycle model. MOOC Programming Technique development was carried out based on a life cycle model which involved five phases namely analysis phase, design phase, the development phase, implementation phase and evaluation phase. This study proposed a model which is called Model Lifecycle MOOC Programming Technique. This research has produced findings that involve the development of Programming Technique course in MOOC. MOOC Programming Technique development process has considered various factors in ensuring MOOC Programming Technique is suited to Information Technology education such as syllabus, and learning and teaching objectives that have been set. A holistic development model is designed and developed to serve as a guide to designers, builders and specialist subjects of MOOC for Information Technology related fields. With the development and growth of e-Learning, lecturers at the universities must develop the materials needed for the e-Learning such as the iBook, videos containing lecture series and other e-learning materials. The e-content should be available for the students to use at any point of time. As for example is by putting learning materials inside university's Learning Management System (LMS). LMS can act as the Virtual Learning Experience (VLE) for the students and the educators can either use the vast variety of platforms available online or they can use the LMS that are already developed by the university. Once the e-content have been developed and it has reached the specification required by the educators, the educators are now able to turn the learning process around or as they call it Flipped Learning.

Key words: *Affective learning, Attitude, online Learning, MOOC, Behaviors*

Content

Introduction

Affective domain in learning and teaching is the most complex, the emotional life of the students and reflects the confidence of the students, attitudes, perceptions, desires, feelings, values, priorities, and interests [1, 2, 3]. This paper will discuss on the literature review of 21st century learning approach using e-learning and how the affective domain is measure using Massive Open Online Courses (MOOC). After

that, the paper will explain the methodology that we use to measure the affective domain. Later, the discussion will continue with the evaluation of affective domain for this sample case. Lastly the paper will end with the discussion and conclusion.

Literature Review

With the use of ICT in education has increased and the spread of network technologies, they have caused the e-Learning practice to evolve significantly. The term e-learning may be defined as learning facilitated and supported using ICT. This may include several activities from the use of the technology to support the learning process as part of an approach called blended learning to learning that is entirely delivers [4]. The term e-Learning therefore covers the use of computers and technology as the main tools for knowledge exchange within teaching and learning. The term 'e' in e-learning used to represent 'electronic' but now; it merely signifies the use of technology [5]. Some circles within the education sector itself refer the 'e' as 'enhanced'. The implementation of e-Learning will be able to provide distance learning or off campus learning for the students [6]. It is also a great tool for a blended learning and teaching approach which mean the students will be exposing with both face-to-face interactions as well as using the technology. E-Learning also will support the uses of technology to support a wide range of educational activity [4].

With the development and growth of e-Learning, lecturers at the universities must develop the materials needed for the e-Learning such as the iBook, videos containing lecture series and other e-learning materials. These resources can be classified as e-content materials are also important in the growth of the local learning system. The e-content should be available for the students to use at any point of time. As for example is by putting learning materials inside university's Learning Management System (LMS). LMS can act as the Virtual Learning Experience (VLE) for the students and the educators can either use the vast variety of platforms available online or they can use the LMS that are already developed by the university [4]. Once the e-content have been developed and it has reached the specification required by the educators, the educators are now able to turn the learning process around or as they call it Flipped Learning.

Research Question

This study try to emphasis the following research questions:

- (i) Is MOOC Programming Technique development methodology for teaching suitable for use among students in higher education?
- (ii) Is MOOC Programming Technique effectively implement students' affective domain?

Methodology

MOOC Programming Technique development was carried out based on a life cycle model which involved five phases namely analysis phase, design phase, the development phase, implementation phase and evaluation phase. This study proposed a model which is called Model Lifecycle MOOC Programming Technique.

MOOC Programming Technique Development

This section describes the findings of a study on the development of MOOC Programming Technique, which have been choose as a sample. MOOC Programming Technique contain twelve sub-topics which is deliver for one semester of study. This subject implemented online approach using the MOOC platform. At Universiti Teknikal Malaysia Melaka (UTeM), C++ language is used as programming technique subject. This is a compulsory subject for engineering and ICT undergraduate students. MOOC Programming Technique provide menu selection as listed below:

- Home Menu
- Student Guidelines Menu
- Modules & Activities
- Peer Content
- Groups
- The Team Profile
- UTeM Portal
- UTeM MOOC
- Administer Students
- Course Setup

Discussion

In general, this study has two main findings. Firstly, the outcomes regarding the development of education MOOC Programming Technique itself. Secondly, regarding the MOOC Programming Technique evaluation of students' affective learning using MOOC Programming Technique in learning and teaching process.

Conclusion

This research has produced findings that involve the development of Programming Technique course in MOOC. MOOC Programming Technique development process has considered various factors in ensuring MOOC Programming Technique is suited to Information Technology education such as syllabus, and learning and teaching objectives that have been set. A holistic development model is designed and developed to serve as a guide to designers, builders and specialist subjects of MOOC for Information Technology related fields.

Acknowledgement

The authors would like to take this opportunity to acknowledge the guidance, help and support provided by Universiti Teknikal Malaysia Melaka (UTeM) Malaysia in making this research possible. The authors also wish to express their appreciation to all the staffs from Faculty of Information and Communication Technology (FTMK) UTeM, Centre for Instructional Resources & Technology (PSTP) UTeM and Research & Innovation Management (CRIM), UTeM for their full cooperation in making this research a reality.

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ID NO. UTeM 009

TOPIC: An Innovative Framework to Cultivate and Strengthen Blended Learning Implementation in UTeM

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Abstract:

In Malaysia, the Ministry of Education through the Higher Education Department and Council of e-Learning Coordinator for Malaysia Public Higher Learning Institution (MeIPTA) has agreed that blended learning is one of the important aspects of 21st-century pedagogy. In order to implement the blended learning in Malaysia Higher Education Institutions, they have done an uncountable amount of discussions, meetings, and workshops regarding blended learning implementation and standardization. The output of those workshops is workable and they finally have come up with some mechanism to measure the blended learning implementation status in all Public Higher Learning Institution (HLI) in Malaysia. In fact, the blended learning implementation status is one of the indicators for the online pedagogy domain which is one of the six major domains in National e-Learning Policy (DePAN 2.0). Therefore, the blended learning implementation is accepted as one of the key performance indicator (KPI) in the initiative for shift 9 (Globalised Online Learning). All 20 Public Higher Learning Institutions in Malaysia need to give their report of blended learning implementation status for every semester to the Higher Education Department through Malaysia Centre of eLearning (MyCeL). Some Public Higher Learning Institution has some problem to achieve the key performance indicator (KPI) target set by the Ministry of Education. In UTeM, specifically in PSTP, all ideas, ways, and efforts have been discussed at several levels to find a solution to increase the number of blended learning implementation among the academicians. An innovative framework is then formulated to cultivate and strengthen the blended learning implementation in UTeM. This innovative framework is used as a reference to plan, introduce and cultivate the blended learning pedagogies in UTeM.

Key words: *Blended Learning, Online Pedagogy, Key Performance Indicator (KPI)*

Introduction

Higher Education has undergone a huge transformation over the centuries. The introduction of technology in education is the cornerstone of innovation in teaching methods and pedagogy. Hence, the introduction of blended learning which is the combination of face to face (F2F) and online learning (non F2F) is being increasingly accepted and explored as an effective method for teaching and learning. According to the operational definition (OD) by the Ministry of Higher Education Malaysia, blended learning (BL) refers to a course that has a mixture of online learning mode (non F2F) and onsite learning mode (face to face - F2F) with the 30% - 79% of the course content and activities are conducted online. This online contents and activities are either to support or replace the face to face (F2F) learning. In

Malaysia, the Ministry of Education through the Higher Education Department and Council of e-Learning Coordinator for Malaysia Public Higher Learning Institution (MeIPTA) has agreed that blended learning is one of the important aspects of 21st-century pedagogy. In order to implement the blended learning in Malaysia Higher Learning Institutions (HLI), they have done an uncountable amount of discussions, meetings, and workshops regarding blended learning implementation and standardization. The output of those workshops is workable and they finally have come up with some standardize mechanism to measure the blended learning (BL) implementation status in all Public Higher Learning Institution in Malaysia. The blended learning implementation status is one of the indicators for the online pedagogy domain which is one of the six major domains in National e-Learning Policy (DePAN 2.0). Therefore, the blended learning implementation is accepted as one of the key performance indicator (KPI) in the initiative for shift 9 (Globalised Online Learning). Table 1 shows the KPI in the domain of online pedagogy in shift 9: Globalised Online Learning.

Table 1. Target of Online Pedagogy domain in DePAN

Domain	Focus Area	Phase 1 2015	Phase 2 2016-2020	Phase3 2021-2025
Online Pedagogy	Blended Learning	30% courses in HEI is in BL	50% courses in HEI is in BL	70% courses in HEI is in BL
	Open Course	Each HEI offered 3 open course (MOOC)	Each HEI offered 315 open course (MOOC)	Each HEI offered 30 open course (MOOC)
	e-Assessment	5% e-Assessment in BL	10 % e-Assessment in BL	15% e-Assessment in BL

All the 20 Public Higher Learning Institutions in Malaysia need to give their report of blended learning implementation status for every semester to the Higher Education Department through Malaysia Centre of eLearning (MyCeL). Some Public Higher Learning Institution has some problem to achieve the key performance indicator (KPI) target set by the Higher Education Department, Ministry of Education.

Learning Management Systems (LMS) and Blended Learning (BL)

Learning Management System (LMS) has become a powerful tool for universities where it can be the main platform to develop and implement an e-Learning environment for the university. Majority of all HLI in Malaysia do have their own LMS for eLearning. In UTeM, the LMS is called ULearn. In ULearn, the instructors /lectures can upload various kinds of learning materials and activities for the students for each course. The students can easily access them, and communicate both synchronously and asynchronously with the instructors/lecturers. Based on the mechanism introduced by the MeIPTA, the status of blended learning implementation in a particular course offered in LMS can be measured. For example, in order to achieve the minimum 30% of blended learning activities, the instructor/lecturer need to upload one (1) course outline, minimum seven (7) resources, conduct a minimum of three (3) activities and create a minimum two (2) online assessment. The resources can be in the form of files, pages URLs, e-books, and video lectures. The activities can be in the form of chats, forum discussions and surveys. The assessments can be in the form of online quizzes and assignments.

BL Implementation Framework in UTeM

In UTeM, Center for Instructional Resources and Technology (PSTP) is the responsible party for developing ULearn as the university's LMS. ULearn in UTeM has gone through several phases of development starting from using the claroline as the early platform until currently use the moodle based platform. Since ULearn is introduced to the UTeM communities, all the ideas, ways, and efforts have been discussed at several levels to find the best solution to increase the number of blended learning implementation among the academicians. Strategic plans for PSTP have been developed to sustain the eLearning initiative in UTeM follows by the UTeM eLearning policy. An innovative framework as in figure 1 is then formulated to cultivate and strengthen the blended learning implementation in UTeM. The framework is based on four grids which are Eliminate- Reduce- Raise –Create that is developed by Kim and Mauborgne (2005). It is a simple matrix like a tool that can drives companies to focus simultaneously on eliminating and reducing, as well as raising dan creating while unlocking a new blue ocean. This innovative framework is used as a reference to plan, introduce and cultivate the blended learning pedagogies in UTeM.

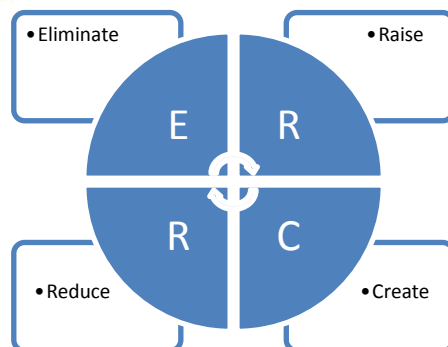


Figure 1. The proposed Blended Learning implementation Framework

Results and Conclusion



Figure 2. The BL Implementation in UTeM before and after the introduction of the framework
For academic session 2017/2018

As shown in figure 2, the BL implementation in UTeM has a drastic incremental percentage after the proposed framework is executed. In semester 1 2017/2018, the blended learning status is only 11% of the overall courses but the percentage increased to 58% in semester 2 2017/2018 after the framework established. We can conclude that the lecturers and students are now more aware and make full utilization of ULearn in UTeM for their teaching and learning activities. The successfully proposed framework can be adapt and adopt by other HEIs that decide to introduce and implement the BL in their institutions.

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ID NO. UTEM 010
TOPIC: Enhancing MOOC for Language Learning Using Social Learning Strategies

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Abstract: This study was initiated by a literature review to investigate whether social learning approach can improve student engagement, and what are the existing social learning strategies that can be implemented to improve student engagement. Results of the study is a conceptual model of learning design. The key principles of social learning theory and its associated ways of applying social learning strategies were used as a guidance in designing our MOOC for learning Mandarin language on OpenLearning platform. Various social learning strategies are applied in the MOOC learning design for each category of the key principles in Social Learning Theory. The design resulted with 14 Lecture Videos accompanied with 24 Dialogue Videos to allow students to observe and imitate the demonstration of various Mandarin dialogues. Also, various Forum questions were designed for each MOOC lesson to allow students to recall and talk about what they have learned. The MOOC has been used by 6 cohorts of students, however Discussion Forums have only been implemented to Cohort 4, 5 & 6. Recent design received 17257 comments from 331 students in Cohort 6 as compared to 9271 comments from 528 students in Cohort 5 and 2993 comments from 309 students in Cohort 4. Completion rates also have increased from 39.31% in Cohort 4 to 90.14% in Cohort 6.

Key words: learning design; social learning strategies; MOOC; language learning

1.0 Introduction

Social Learning Theory was introduced by Albert Bandura (1977). According to Bandura, people actually learn from each other. Learning happens when people generated information through observation, imitation, and modeling. Spencer (2015) concluded that there are three main categories of conditions that contribute to effective modeling during the learning process: 1) Attention – various factors may affect people attention including individual sensory capacities & past reinforcement, 2) Memory – includes people retention and reproduction ability, and 3) Motivation – which cause people to imitate what they learned. Based on Bandura's Theory (1973) (1977) & (1986), Spencer (2015) recommended ways in using technology to implement a social learning strategy in e-learning.

This study aims to investigate the application of Social Learning strategies in MOOC for language learning. The following research questions are addressed:

- i. Can social learning approach be used to improve student engagement?
- ii. What are the existing social learning strategies that can be implemented to improve student engagement?
- iii. How to implement social learning strategies in MOOC for language learning?
- iv. Is there any difference in student engagement before and after the implementation of social learning strategies?

2.0 Related Works

According to Pilli and Admiraal (2017), MOOC platforms can facilitate both online and offline communication. Authors stated that the platform is suitable for designing social learning experiences. The study connects the pedagogy of a MOOC and the interaction and communication of students (Pilli &

Admiraal, 2017). According to Cartner and Hallas (2017), social constructivist learning theory blends two perspectives: (i) constructivism and (ii) social learning.

Marzano and Ochoa-siguencia (2017) stated nowadays, social learning represents both an opportunity and a challenge for the training profession. Social learning as an interactive group process in which learners actively construct knowledge and then build upon that knowledge through the exchange of ideas with others (Henry & Marrs, 2015). A social learning approach assumes that students will find it less difficult to construct new knowledge when they are able to think through new concepts and problems in discussion with peers (Cartner and Hallas, 2017). In the social learning process in the discussion forum analyzed, results will help to get useful feedback about the learners in time from their early behavior and improve the understanding of the evolution of discussion forum (Zhu, Wang, Zhao, & Zhang, 2017). The author concluded that can be used to inspect the relationship with participation retention and performance as well. Manathunga et al. (2017), mentioned that social learning may; (i) bring a sense of community, (ii) avoiding isolation in online learning and (iii) providing possibilities to learn from others.

According to Crossley (2014), discussion posts are of interest within research on student participation in MOOCs because they are one of the core methods that students use to participate in social learning. In discussion forums activities, students with a platform to exchange ideas, discuss lectures, ask questions about the course, and seek technical help, all of which lead to the production of language in a natural setting. However, other than discussion forum, some initiatives offering collaborative and social learning opportunities are emerging within MOOCs, given the concern of implementing novel pedagogies and learning theories (Manathunga et al., 2017).

3.0 Design & Methods

The study was initiated by literature review investigating whether social learning approach can improve student engagement, and what are the existing social learning strategies that can be implemented to improve student engagement. Results of the study produced a conceptual model of learning design encompassing of the 3 key principles of social learning theory and all the associated potential social learning strategies that can be implemented for language learning: i) Observational Learning which includes Lecture Video, Dialogue Video, Video Conference, and Language Clinic, ii) Memory Retention which includes Interesting Forum, Storytelling Activities, Mini Project, knowledge Sharing, Peer-to-Peer Activities, and iii) Motivation & Reward which includes Bonus Points, Badges, Leader Board, Peer-to-Peer Grading Points, and Points/Marks. Figure 1 shows various social learning strategies applied in the MOOC learning design for each category of the key principles in Social Learning Theory. There are 14 Lecture Videos with an average duration of 7.72 minutes/video. Lessons are also accompanied with 24 Dialogue Videos with an average duration of 7 seconds/video to allow students to observe and imitate the demonstration of various Mandarin dialogues.

Key principles of Social Learning Theory	Social learning strategies applied in MOOC learning design
Observational Learning • People learn through observation.	 14 Lecture Videos, and 24 Dialogue Videos
Memory Retention • People internalize information in their memories and recall the information to respond to a similar case. An information is memorable if it is connected with context & emotion.	12 Forums
Extrinsic Motivation	Badges
Intrinsic Motivation • People need motivation to learn. Motivation can be in the form of reward or punishment. • People also need intrinsic motivation or intrinsic reinforcement to learn.	40 e-Activities with Progress Checklist, and Certificate of Completion

Figure 1 : Various social learning strategies applied in MOOC learning design for each category of principle in Social Learning Theory

The MOOC has been used by 6 cohorts of students, however Discussion Forums have only been implemented to Cohort 5 and 6. This study involves four phases: (i) literature review, (ii) analysis, (iii) design & development and (iv) evaluation.

4.0 Result & Discussion

In this section, we analyze the results of applying various social learning strategies discussed in section 3 to find the answers for research question: Is there any difference in student engagement before and after the implementation of social learning strategies?

4.1 MOOC Completion Rate

Based on the data analyzed, we can conclude that the MOOC completion rates for each cohort have kept on increasing every time it is offered. Cohort 6 shows the highest completion rate with 90.14% for 90 to 100% completion. Result analyzed shows the overall status of students' completion rate for Cohort 6 which highlights that 256 students managed to complete the course with 100% completion. Most probable cause would be the learning design has been given continuous improvement by the MOOC developers, and new learning strategies designed.

4.2 Lecture Video

Table 1. Results of applying Video Lecture and Discussion Forum for cohort 6

Lesson		Duration of Video	% of students viewed		% of students completed		Views		Comments		Average Time spent on Page (Minutes)		Average Comments per	Average Views Per Student per
Vide	Foru	Vide o	Vide o	Foru m	Vide o	Foru m	Vide o	Foru m	Vide o	Foru m	Vide o	Foru m	Foru m	Foru m
1	1	9.4	82.83	78.61	82.23	80.12	885	542	140	607	29	10	1.83	1.64
2	2	8.06	78.92	76.51	80.12	79.52	623	458	159	503	11	10	1.52	1.38
3	3	8	78.61	76.2	79.52	78.92	580	608	145	507	12	9	1.53	1.84
4	4	3.54	76.81	-	78.92	-	571	-	152	-	10	-	-	-
		0.53	77.11		78.92		428		138		8			
		6.49	76.81		78.61		482		136		9			
5	5	10.07	76.51	77.41	78.61	78.61	531	517	114	421	16	9	1.27	1.56
6	6	9.09	76.51	77.11	78.61	78.61	493	464	140	337	13	15	1.02	1.40

7	7	6.58	77.4 1	76.8 1	78.61	78.61	336	443	118	337	10	14	1.02	1.34
8	8	9.22	77.7 1	76.8 1	78.61	78.61	445	387	127	353	14	16	1.07	1.17
9	9	8.02	77.4 1	76.2	78.61	78.31	446	412	124	358	14	16	1.08	1.24
10	10	12.5 5	77.1 1	77.1 1	78.61	78.31	463	385	122	353	16	16	1.07	1.16
11	11	9.12	77.4 1	77.7 1	78.61	78.31	410	392	123	363	18	18	1.10	1.18
12	12	7.45	78.0 1	76.8 1	78.92	78.31	376	428	121	398	17	19	1.20	1.29
Overall		7.72	77.8 0	77.0 3	79.11	78.75	21.36	15.21	5.62	13.71	14.07	13.8 2	1.25	1.38

Table 1 shows the results of applying Lecture Videos for Cohort 6. As we can see from the results, in average, 79.11% of the total students complete their learning by watching a Lecture Video. Also, in average 77.80% of students watched a Lecture Video with an average of 14.07 minutes being spent for each video.

Self-learning efforts via MOOC require students to have high motivation to learn using the lecture videos by observing and imitating the demonstration by instructors. It is expected that students would spent on each lecture video more than once. From the average time spent for each video, we can conclude that each student learn by repeating the video 4 to 5 times considering an average duration of a lecture video is 7.72 minutes.

4.3 Discussion Forum

Table 1 shows the results of designing 11 Discussion Forum for students in Cohort 6. In average, 77.03% of the students viewed the Forum, and 78.75% of students have completed the required task in the Forum. Also, in average, each Forum received 13.71 comments/posts by each student, and average time spent by a student on a Forum is 13.82 minutes.

5.0 Conclusion

In conclusion, the application of social learning strategies in MOOC has shown a difference in student engagement, in particular students have shown learning efforts by engaging with Lecture Videos and Discussion Forums as evidenced by the results discussed in 4.2 and 4.3 above. However, this is referring to students that have motivation to learn which only about 80% of the enrolled students that managed to complete both Lecture Videos and Discussion Forums. In future effort, we will need to work on strategies that can increase students motivation whether intrinsic or extrinsic motivation.

Acknowledgement

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ID NO. UTHM 001	TOPIC: Question-led Approach to Present Instructional Content in Game-Based Learning of Data Structure

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Abstract: Data structures are ways of organizing data in computer memory for efficient storage and retrieval. It is an important course in computer science or information technology programs as it is applied in most other courses. Mastering it is imperative to be a high-achieving student and a good worker. However, understanding it is a global problem because of its abstract and complex nature. Past efforts to simplify learning including static, animated and interactive visualization gave mixed outcomes. Game-based learning has proven to positively affect learning outcomes of data structure. But most data structure game-based learning are for the purpose of assessment, meaning the games were created to test players on how much they have learn in class, rather than actually teaching them the algorithms of various operations of various data structures. An improvised method to present instructional content in data structure game-based learning was introduced, whereby the algorithms of data structures' operations is converted into a series of questions that mimics the thinking process that a student should go through in order to solve data structure problems. The method will enable easier recall of algorithms, which in turn enable easier understanding and therefore easier to apply in problem solving, as suggested in Bloom's Taxonomy of cognitive learning domain.

Key words: *algorithm, data structure, game-based learning, question-led*

Introduction

Data structure is the way data in computer memory are organized (Matzko and Davis, 2008) for efficient manipulation. Because it is applied in many areas of Computer Science and Information Technology (Wassila and Tahar, 2012), it became a core course that a student needs to master to be successful academically and job-wise. The usual data structures covered in syllabus are array, linked list, stack, queue, tree and graph.

However, teaching and learning data structure is difficult because of the abstract (Shabanah et al., 2010) nature of the course. Teaching requires lengthy explanation, often aided with illustrations (Shabanah, 2010). There are also many data structures to teach and learn, with each data structure having several operations, and each operation having its own algorithm. This causes confusion to the students, leading them to often mixing one algorithm with another during assessments, thus negatively affecting their academic performance.

Past research came up with various methods to simplify data structure learning. Unfortunately, static (Matzko and Davis, 2008), dynamic (Lauer, 2008) and interactive (Boilen et al., 1999) visualizations unable to engage learners continuously, frequently and actively. Shabanah et. al (2010) proposed a game-based learning (GBL) of data structure, combining the attractiveness and benefits of game with the instructional content of data structure. But review of literature shows that most data structure GBL are used for assessment i.e. students apply the data structure algorithms learnt in class during game rather than learning the algorithms through the game.

The Socratic Method is a long-standing excellent instructional tool as teaching by questioning has been proven to be better than teaching by telling (McCain, 1999) as it stimulates thinking, learning, action, and results (Adams, 2010). Question-led approach has been used in various discipline such as economy (McCain, 1999) and .mathematics (Soancatl et al., 2010). In this paper, we present an alternative way of

designing data structure GBL, which is through the use of question-led approach, to create a gameplay that leads to meaningful learning.

Methodology

Our GBL design is based on GBL model by Garris, Ahlers and Driskell (2002), consisting of three phases; input, process and outcome. In input phase, instructional content is presented using game characteristics, resulting in a game cycle of judgement, behaviour and feedback. After debriefing, a player will conclude whether the learning outcome is achieved or not.

Three data structure GBL is designed and developed for the purpose of this research, covering three data structure topics; linked list, graph traversal and shortest path. Notes for each topic is included in the games for player to study or revise before play. Game characteristics utilized in games are game context, graphics, sound, time, life, score and screen.

Player interact with game using a mouse or finger (touch display). Game graphics are in 2D. Two types of audio are used in games; background audio (plays continuously during game) and sound effects (heard during certain events e.g. button click/touch, correct answer, incorrect answer, won, and lost). A 'positive' audio is played for correct answers and game won, while a 'negative' audio is played for incorrect answers and game lost. All three games have a zombie theme, therefore zombie-like audio is played during the start of all game application.

The background story of the three games are actually related to one another. In linked list data structure GBL, an evil scientist created a virus that can turn a human into a zombie. The virus is injected to several humans which then released into the busiest train station in Malaysia, spreading the virus as the train embark and disembark along its line. In graph data structure shortest-path GBL, a group of scientists must find the shortest path to a research facility to distribute the antidotes to the virus using Dijkstra algorithm. In graph data structure traversal GBL, a group of scientists must travel to find and cure the zombies with the antidotes using Breadth-First-Search and Depth-First-Search algorithms.

23. During game, overhead display (OHD) consisting of time, life and score will show time left, life left and score attained respectively. Life decreases for each incorrect answer whereas score increases for each correct answer. Player wins when mission finishes within given time and life and loses when time or life reaches zero before mission ends. Game screens are Title, Menu, Demo, Story Overview, Play, Won, Lost, Exit and Credits.
24. Linked list data structure GBL covers several operations; create list, insert first node, insert node at the beginning, at the end, in the middle as well as delete node at the beginning, in the middle and at the end. Algorithms of operations are presented in non-sequential order. Thus players need to arrange the algorithms according to the correct sequence. Question-led approach is used whenever the next step is a condition or a loop (Figure 1 (i)). In graph data structure shortest-path GBL, Dijkstra algorithm is presented as a series of questions from start to end. Players answer questions based on a map and a table (Figure 1 (ii)). The same goes for graph data structure traversal GBL. Breadth-First-Search (BFS) and Depth-First-Search (DFS) algorithms are simulated as a series of question from begin till end. Players answer questions based on two diagrams (Figure 1 (iii)); a map and a stack (DFS) or queue (BFS).



i. Linked list data structure GBL



ii. Graph data structure shortest-path Dijkstra algorithm GBL



iii. Graph data structure traversal GBL

25. Figure 1: Data structure GBLs using question-led approach

26. Game graphics are edited using Adobe Photoshop. All multimedia elements namely text, graphic, audio, animation and video are integrated using Adobe Flash.

27. Conclusion

This study presents implementation of a question-led approach in designing data structure GBLs. Commercialization is possible since market size is big as data structure is usually a core course in most Computer Science and Information Technology programs in higher education institutions. Thus profitability is projected to be significant. In future, we will strive to design data structure GBL's gameplay that can achieve a perfect balance between fun and learning, making learning more meaningful.

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ID NO. UTHM 002
TOPIC: Go Virtual! Mobile Application for Japanese Language Using Virtual and Augmented Reality Technology
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Abstract: Multimedia elements commonly being applied in many applications in recent times due to the ability of enabling people to engage with the current technology while making learning fun. This enhanced the effectiveness of teaching and learning process especially among children. Through the implementation of current technology such as virtual and augmented reality into mobile application, it is effectively enable learning platform are reachable to the user with lesser cost compared to hardcopy materials for learning. This paper discusses on the development of mobile application for language learning through implementation of current virtual and augmented reality technology. The post evaluation indicate the effectiveness of such application with current technology has made educational environment more engaging and fun. Furthermore, the paper discusses trends towards the future for further research in implementing virtual and augmented reality for educational settings.

Key words: *mobile application, augmented reality, virtual reality, language learning, education*

Introduction

Technology enhanced learning application has been widely being used in many educational related applications recently. Among such emergent technology that are widely being used is virtual reality (VR) and augmented reality (AR) technology which are used in many application recently. Incorporating such attractive elements in any application enable teaching and learning process to be conducted effectively while attracting number of learner compared with traditional method of teaching and learning with blackboard (Bacca, Baldiris, Fabregat & Graf, 2014). VR and AR technology has been implemented in mobile and non-mobile applications recently where it demonstrated for the extreme usage in increasing the motivation of students in the learning process (Jara, Candelas, Puente, & Torres, 2011; Bujak et al., 2013; Chang et al., 2014; Ibáñez, Di Serio, Villarán & Kloos, 2014). Studies show that learning process become interactive and understandable when the students are able to be involved directly to experience it. "Tell me and I forget. Show me and I remember, Involve me and I understand" (Chaplot & Khan, 2016) statement proves the importance of student participation to enhance understanding. It is growing in popularity due to its interactive way in communicating user with technology (Sicaru, Ciocianu & Boiangiu, 2017). As such, technology such as VR and AR plays vital role in engaging people and developing practices that was unable to be conducted with other technology (Foster & Cuniff, 2016; Lee, Chau, Chau & Ng, 2017; Sicaru et al., 2017). Objective of this paper is to develop prototype of mobile application to teach Japanese language combining both VR and AR technology to enable in identifying how these current technology are being used effectively in the learning experience more interactively. Moreover, it is quite difficult to attract children to learn something that is extraordinary with traditional learning technique in the extensive use of technology. They will be bored easily as lack of fun in learning to attract them. This application would be a useful teaching aid

that can change the technique and learning activity attractively rather than normal traditional way of learning.



Content

Description of Innovation

The AR-VR Japanese Language Mobile Application operates on smartphones with Android based operating system. Relevant material which is the image marker for viewing augmented images and Android glass for viewing the virtual images are needed to be used together with this application. Development of this application was done by implementing the design of user interface and the functionality of application with integration of the technology. Software such as Vuforia, Unity 3D, Microsoft Visual Studio, Android Studio, Autodesk 3Ds Max, Adobe Photoshop, Adobe InDesign and Sound of Text were used in developing this application.

The main component of this application is the education component with three different categories in learning Japanese namely; animal, shape and numbers. This categories teaches the user especially the preschool children or beginner learner on pronunciation the Japanese words with selected category. The words can be played through

audio embedded in the application. This is includes in the AR images or markers created to display the 3D images which is scanned using the smart device camera.



Figure 1: Screenshots of the AR-VR Japanese Language Mobile Application

The application having three categories. Animal and number category consists of 10 target images each and shape category have 6 target images. All the elements to develop this application been combined in Unity and being compiled by using Android Studio SDK. Then the application can installed into the mobile devices. The application consists of main menu, quiz, gallery, category, and an information page.

Background

Making learning attractive and engaging especially among pre-school children is a challenging process. As such AR-VR Japanese Language Mobile Application will enable learning and teaching process more easy as multimedia and attractive newest augmented and virtual reality technology has been embedded into this application. Besides that, learning can be made easily available from anywhere since mobile platform has been highlight for this application as well.

Importance to education

The followings are some of the importance of AR- VR Japanese Language Mobile Application to education:

Pre-school Children

- i. It will help the pre-school children's to engage in learning process as multimedia content has been a highlight in this application.
- ii. Learning became easy for the children as mobile platform application enable learning from anywhere and at any time for them.
- iii. Learning new language became easy as different module with voice over and text are provided for easy learning.

Teacher/ Parents

- i. Helping the teachers or parents to implement the application for learning from anywhere.
- ii. Reducing traditional paper and book method instead more towards technology enhanced teaching.
- iii. Increasing the reliability of learning among pre-school children's as current traditional process are found to be rather less engaging for the children's.

Advantages of innovation towards education and community

AR-VR Japanese Language Mobile Application specifically help teachers in pre-school to make learning language among the children in more engaging way through the usage of current technology. Furthermore, this application can also be used by parents in teaching their children from anywhere as mobile platform make the application easy assessable. The use of this application is not limited to pre-school children but the easy learning and augmented technology elements can be used by different ages of people to learn the language easily as it focus for beginner level.

Commercial value

The idea of developing AR-VR Japanese Language Mobile Application can be commercialized to all pre-school in Malaysia as part of technology embedded teaching and learning process in classrooms as this application are implemented on mobile platform with latest technology; augmented reality as main highlight. Besides that, this application can also be used by parents as part of teaching and learning process outside school which can motivate the children to be more engaging in learning alongside getting closer to the technology.

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ID NO. UTHM003
TOPIC: Mobile Based Periodic Table Game (M-PTG)
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Abstract: Periodic Table Game (PTG) is periodic table game based on mobile application for PT3 Science subject. This application targets secondary one to secondary three students as part of their preparation for examination. The M-PTG enable the students to identify and help in memorization through effective and interactive way of learning. Elements of multimedia enable to attract students in enabling them to engage in learning while mobile based application ensure learning became easy from anywhere and at any time. The application developed using Adobe Flash and consists of different levels of interactive game based on the periodic table.

Key words: *game, mobile application, Periodic Table, science subject, secondary-school, PT3.*

Introduction:

The mobile applications has been extraordinary changer of the popularity for smartphones in everyday life. Almost everything can be done on smartphones including learning activities. Undeniably, applications type game is most popular downloaded in the world. This is because, people prefer fun and entertainment. There are many methods for interactive learning that are currently able to stimulate the students' interests and abilities besides having fun. They are not necessarily learning formally. The multimedia elements adapted in the form of mobile application are part of learning platforms nowadays. These innovative outcomes can help students in remembering skills.

Mobile Based Periodic Table Game (M-PTG) is a periodic table game used by PT3 students. It functions as an introduction to 30 elements of chemical in the periodic table. This game use periodic table notes in the form of games. The application is a virtual quiz that allows students to answer questions given while memorizing information content. M-PTG provides score and displays the result every time the user answered. They will be motivated easily and redefine failure to a higher score. The displayed results allow students to be more inclined not to make the same mistakes. According to Ford and Roby (2013), one of the main problems in academics is the lack of motivation for academic activities due to the lack of intriguing teaching strategies to meet the needs of students. Learning based on the game is the best application because it makes the concept of learning more effective. With the current learning and technological advancement, games can be used to create new learning processes that are much more interesting than traditional based learning, especially for memorizing subjects. Many students have no memorization skills, but they are credible in the activity. This application will be a helpful teaching aid that can transform learning techniques and activities application in learning rather than the usual traditional way of learning.

Content

1. Description of Innovation:

Periodic table game applications (PTG) operate on smartphones with Android-based system handling. Multimedia element with a classroom theme has been selected as a preview of this M-PTG interface. This M-PTG provide two-way interaction whereas the user answer and receive feedback. Software such as Adobe Flash and Adobe Photoshop have been used in developing M-PTG.

The main components of this application are educational components with two different categories of beginners and experts. This category teaches user at level beginners by introduce chemical names and random questions at level experts. There are have audio, animations embedded in this application and some pages like main menu, quiz, notes, and results page. This application can be installed to mobile device.



Figure 1: Screenshots of the Periodic Table Game

2. Background:

Making learning attractive and engaging especially among student PT3 is a challenging process. This application will allow the teaching and learning process easier as multimedia technology has been incorporated into this application. Additionally, learning can be made easily from anywhere as mobile platforms have been highlighted for this application as well.

3. Importance to education:

Students:

- i. This will help PT3 students engage in learning process because multimedia content is the focus of this application.



- ii. Learning is easy for students to learn and practice from any platform and any time.
- iii. Skills remember to be easy with continuous training.

Teacher / parents

- i. Reduces traditional paper and book methods and more on technology-enhanced teaching.
- ii. Facilitate teachers or parents to attract children to learn and practice.
- iii. Multiple teaching methods.

4. Advantages of innovation towards education and community:

M-PTG specifically helps teachers in school to teach in the science subject of PT3 among students in more ways through the use of current technology. Additionally, this application can also be used by parents in teaching their children from various platforms and everywhere. Use of this application is not limited to PT3 students but can also be used by chemistry students to learn from the initial level.

5. Commercial value:

The idea of developing a mobile application of regular timetable games can be commercialized to all secondary schools in Malaysia as part of the technology-embedded teaching and learning process in the classroom as this application is implemented on a mobile platform with the technology. In addition, this application also can be used by parents as part of an outside teaching and learning process that can motivate students to learn more while applying technology for better usage.

Acknowledgement:

Special thanks to everyone who helped and contributed to making this project a fabulous success.

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ID NO. UTHM 005	TOPIC: Engaging Classroom Using Game Based Quizzes (EDventure)

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Abstract: Games provide a context for engaging practice. For example, mathematic is one of the subjects that need a lot of practice so that the students can understand how to apply certain concepts and formula on various types of problem. However, for the practice to be meaningful, students must be engaged. Countless workbook pages or textbook exercises are not always highly engaging, especially if this type of learning medium is presented in other subject as well. Through lively games students willingly work hard to get the correct answer and try repeatedly, gaining much-needed practice. Research has continuously shown such that game-based learning (GBL) is a way to engage students and appeal to diverse learning styles. **EDventure** is a game based application developed to serve as an assisting tools for teacher and student to engage in a fun learning environment in the classroom. It is based on a quiz game concept in which students are offered 3 types of adventure game with sets of questions for each game. The questions in these quizzes are 'dynamic' questions meaning it can be change and updated at 'runtime'. **EDventure** is being presented as an android mobile game (.apk) and also as windows based desktop game (.exe) while the questions and answers presented in the game can be updated by the teachers from an external file that acts as a database.

Key words: *games based learning, engaging classroom, dynamic quiz, learning tool*

1. Introduction

Various methods of learning and teaching or in Malay called 'Pengajaran & Pembelajaran' (P & P) that can be applied in the classroom to enhance students' skills. According to Jamaluddin (2000), different approach in P & P is able to provide opportunities for students to apply what they have gained in the course of everyday life. One alternative approach that is associated with Research and Development (R & D) is through the use of technology (Hoon, T. S., 2010). According to Sanjaya M. and Ramesh C.S (2004), the application of technology in education brings benefits to the global economy. Multimedia-based learning approach to transferring information from a form of static text books to a new learning patterns are more interesting (Jamaluddin, 2000). **EDventure** may increases the student's engagement in the classroom when the game is being conducted as well as increasing the teacher's awareness regarding each student's ability in the particular subject. In addition, by using this tool in class, it is also able to tap their creativity and innovation by applying what they have learned via computer multimedia technology which also contributes to the teaching and learning advancement. **EDventure** addresses these following issues; i) current module-based learning which only incorporates texts and diagrams does not successfully capture the student's interests in doing exercises and ii) students have difficulties in engaging in the activities and teaching conducted in class. The goal of **EDventure** is to produce strengthening exercises and understanding through sets of 'dynamic' questions in the form of quizzes which applies adventure game playing. This is to create a fun learning environment that is less stressful in order to help raise the level of student understanding and participation. For game testing purposes,

EDventure incorporates Mathematics UPSR 2017 past year questions which consists of 40 objectives questions. The objectives of **EDventure** are listed as follows:

- (i) To design a 'dynamic' learning media that is based on game based learning.
- (ii) To produce a 'dynamic' learning application that uses a 'game-based' approach that incorporates multimedia elements to attract students.

2. Background

The background studies have been conducted towards 2 types of multimedia based learning sources which are i) module-based learning application such as courseware, videos and quizzes and ii) game-based learning application. Most courseware that have been studied are those produced by previous Diploma students in UTHM for their final year project such as courseware for course Data Structure (Afiah I. *et al.*, 2014), Systems Analysis and Design (Mohd H.M., 2014) and Java Programming (Rasyiqah A. *et al.*, 2014) and in which all are produced in 2014. Videos and quizzes from various sources over the internet have also been explored. Meanwhile, studies on game-based learning application were conducted on Educational Game for Introduction to IT course (Mohd I. *et al.* 2014) developed by diploma students from UTHM. Article displayed by New Media Institute in <http://www.newmedia.org/game-based-learning--what-it-is-why-it-works-and-where-its-going.html> discussed the meaning and impact of game-based learning application. Based on the article, an effective game-based learning applications can draw us into virtual environments that look and feel relevant and familiar. According to Dr. Susan Ambrose, director of Carnegie Mellon's Eberly Center for Teaching Excellence, this is motivational because we can quickly see and understand the connection between the learning experience and our real-life work.

3. Scope

'**EDventure**' target audience and users will be the teachers and students in Primary and Secondary schools as this game used simple concept of playing as well as adorable characters that are more suitable for kids. This application consist of 3 themes (Penguin in North Pole, Zombie on Halloween, Lion in a Circus) with different character in which the character needs to walk and jump to reach the target item which represents questions that need to be answered before able to continue with the game. It is a 'quiz' game where the questions are retrieved from an external file which is a 'json' format file. This means that the quiz can be updated anytime ('dynamic') by the owner, teacher or educator which then will be reflected in the game. There is no programming language or complicated software needed to change the content of question file thus making it user friendly and faster to be executed and used. The product is published in android mobile format (.apk) and windows based game (.exe). The external file (.json) can be opened and edited using any text editor. The user manual for owner or admin to edit the questions are also provided for reference.

4. Process and Design

To develop this game-based learning application, ADDIE model was selected as a development methodology. Each phase has its own purpose, which lets developers set the pace of work while carrying out the construction process. ADDIE stands for Analysis, Design, Development, Implementation and Evaluation.

4.1 Analysis Phase

In this phase, the process of analyzing requirements based on the learning game development was being done. For example, an analysis of the content of lessons and learning styles. Learning style refers to how they receive and process information to be converted to a form of knowledge. In addition, some analysis such as the analysis of potential users and the analysis of the learning environment is also carried out. The UPSR past year paper and a couple of exercise books for Mathematics, History and Malay subjects were studied.

4.2 Design Phase

This phase is carried out after the needs analysis process is completed. The whole view about the shape of the product, structure, learning theory, types of media and technology that will be involved were confirmed after the analysis phase. Among the element that needs to be determined in this phase is the user interface. To confirm the interface, look and flow of the product, methods of sketching storyboard is implemented.

4.3 Development Phase

In the development phase, the application is developed using game development software which is the Unity 3D, meanwhile Adobe Illustrator was used to design the character and themes. Unity 3D is a widely used application for 3D android game development. It uses C# programming language as well as incorporating JSON file format to store the questions and answers which act as a knowledge base for the game. JSON file is a file that stores simple data structures and objects in Javascript Object Notation format, which is a standard data interchange format. JSON files are lightweight, text-based, human readable and can be edited using text editor.

4.4 Implementation Phase

The implementation phase is aim to make sure that this application is built to meet the objective and is suitable for the usage of the targeted users. This way, problems can be identified which were not realized during the design phase and during development. Before the formalization of the product, aspects of weaknesses that were identified before has been improved such as elements of 'Lives' in which player will be given 3 try outs, if the character died upon falling of the edges, the lives will be deducted. Meanwhile, 'Marks' reflect the number of correct answers, and was also improved as well as the level of land movement in this phase.

4.5 Evaluation Phase

Evaluation is divided into two parts namely, formative assessment and summative assessment. In this study, a formal assessment is carried out with Mathematics teacher and her students from Sekolah Kebangsaan Kampung Raja, Panchur, Johor. The results shows that 75% satisfies with the animation and graphics, while 25% categorized it as 'great'. 100% agreed that the audio in this product is 'good'. Meanwhile, 100% agreed that it is a great alternative other than the ordinary exercise book.

5. Importance to Education

The aim of usage of this product is for the Primary and Secondary students in Malaysia or even outside of Malaysia as the game is mainly graphics or visual rather than text based. The display or instruction in the game is in English, while the content of questions depend on the owner's or teacher's preference language as the questions are being inserted by them. The results of the study and collection of information was carried out amongst standard 6 students and Mathematic teacher at the Sekolah Kebangsaan Kampung Raja, Panchur, Johor. The application can help the students perform exercises in an interesting way, ease the educator's work and also enhance the quality of teaching and learning. The importance to students and educators are explain as follows;

a) Student

This learning media applications has its own way of conveying messages in a way which cannot be achieved by the print media. Multimedia application, is expected to give a new dimension to students which embed learning techniques that lure the audience focuses to deliver information effectively. Next, it also may help students to address or focus more on their weak parts.

b) Educator

Educators can use the media as a tool to help ensure the delivery of learning and teaching environment that is engaging, active and effective. With this, the teaching process becomes more meaningful and the quality is in line with the Ministry of Education.

6. Advantages

Advantages of this product towards education and community;

i) Introduced an alternative and a 'portable' medium of learning in the form of a 'quiz' adventure game whether using mobile phone, tablet or a notebook.

ii) It enhances the engagement in learning and teaching in the classroom which take place effectively through combining multimedia elements thus closing the gap of traditional method of teaching and learning.

iii) The product will not be obsolete as the content or questions can be edited and updated through time by the owner or teachers according to their preferences.

7. Commercial Values

We believe that this product has a commercial values in which it can be published as a desktop game (.exe) as well as mobile application for android (.apk). It can be uploaded to Google Play Store for easy download to the students as well as distribution by the teachers themselves. As the game is in English and questions are store in a knowledge base concept (JSON file), thus it is user friendly and may be used by other country apart from Malaysia.

Acknowledgement

We are grateful for the help and participation of Sekolah Kebangsaan Kampung Raja, Panchur, Johor in this project.

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ID NO : UTHM 006
TOPIC: The Development of Mobile Learning Apps to Enhance Jawi Learning Experience for Preschool Towards Education 4.0
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Abstract: Mobile learning (M-learning) is an educational system that soon will take place the old fashion way, M-learning support by mobile device to ensure a continuous learning process. M-learning enable user to experience learning process anywhere and anytime. Thus, making learning experience more fun with an interaction that engaging learning environment. However, there are still problems and challenges including to understand the critical success factors on the development of M-learning apps that suits the students. This paper discuss the development methodology of "Adik-adik Jawi" a Mobile Learning Apps for Preschool students to learn Jawi (Arabic Alphabets) and the criteria's that need to be implement to enhance learning experience. The design and development process need to consider several critical success factors such as the use of attractive colour, animation, graphic, text and audio in order to optimize the learning engagement. This will allow the learning process becoming more fun and meaningful. It will also embrace the student's skills on critical thinking, problem solving, creativity and many more positive aspects. To justify the objectives, the student's engagement during learning session is observed to see the enhancement of students' learning experience. This application is very important as a social responds to instil patriotism values. As we know Jawi is the essence of Malay's writing and identity. For the Muslims, it is important to learn Jawi in order to recite the Holy Al Quran. The development of Jawi in the archipelago is in line with the propagation of the religion of Islam which has become the holding of the Malays.

Key words: Mobile Learning Apps, learning experience, collaborative learning, Education 4.0

Content

Description of innovation.

Jawi was first introduce during Malay Sultanate era (Malacca Malay Sultanate) by the Arabic trader in the 10th Century (Hashim Musa, 1999). The development of Jawi in the archipelago is in line with the propagation of the religion of Islam which has become the holding of the Malays (Hamdan Abd Rahman, 1999). From the statement, it's clear that Jawi is the essence of Malay's writing and identity. It is important to learn Jawi in order to recite Al Quran. However, from the observation and research from a Professor Pusan University of Foreign Studies that has been reported in local newspaper article (KOSMO, 2012). Jawi is gradually decrease by year because of younger generations are not interested to learn Jawi anymore. Moreover, children are not being nurture from the beginning. This become a problem to our tradition due to lack of motivation and education from parents and teachers. These situation encourage

and motivate to the development of M-Learning Apps for young generation (Preschool Students) to learn Jawi.

M-Learning is an educational system which engaging students to self-learning with their mobile devices, it is in line with the desire of Education 4.0 that the learning process can be conducted anywhere and anytime. This allow the studies environment becoming more fun and more meaningful to the children. M-learning is growing in popularity due to technological developments in 21st century. M-learning exist in many different form for example audios, words and videos. There are two ways of M-Learning, the first one is asynchronous way which is a learning without an interaction such as preparing homework while watching a video. The other one is synchronous way which enable user to interact for example using an application where user enable to interact with the content or get a direct feedback from a teacher (Brian, 2015).

As to enhance the learning experience it is believed to have a collaborative learning styles taken place. Collaborative learning is an educational approach to teach and learn that involve a group of students (Gerlach, 1994). This method involving a group of student discussing with each other in order to achieve a significant result and a meaningful project. According to (Gerlach, 1994). Collaborative learning is a natural social act which the participant talk among themselves. This method create an opportunity where a passive student involving themselves to the discussion, also a teacher can learn a few things from their student and student can achieve a meaningful studies from the discussion. Collaborative learning allow students to co-operate with each other to strengthen their skills also develop their weaker skills (Fuchs et. Al, 1997).

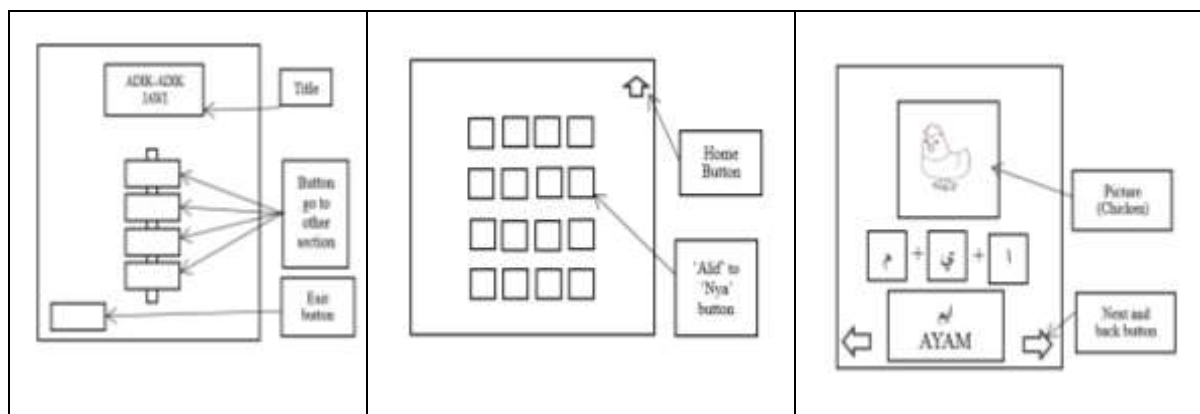
Background of the innovation and development.

Methodology use to develop the application is ADDIE (Analysis, Design, Development, Implementation and Evaluation). This method use to introduce an approach to instruction design that has a proven record of success (Branch, 2009). In the first phase, which is an analysis is taken place to get the information regarding the user requirements and the Operating System(OS) that need to be analyze before developing the application. From the survey of Mobile Operating System Market Share in Malaysia it is found that 84.25 % is an Android' user as shown in Table 1. This is due to the fact that Android is an open source and free licensing OS. With the spirit to penetrate more user and commercial value, the application was developed using android-based apps.

Table 1 :Mobile Operating System Market Share Malaysia

Android	iOS	Unknown	Windows	Samsung	Series 40
84.25%	13.52%	1.65%	0.13%	0.12%	0.1%

Secondly is the design phase where the storyboard and interfaces are taken place. This phase illustrates the overall implementation of prototypes through story boarding methods. Storyboard design shown in figure 1. The story board are separated to four parts based on the learning module. First part is on how to learn Jawi's alphabetic characters. Second part is the application on Jawi's alphabetic combination to make a word. While for the third part is the quiz and the final part is story.



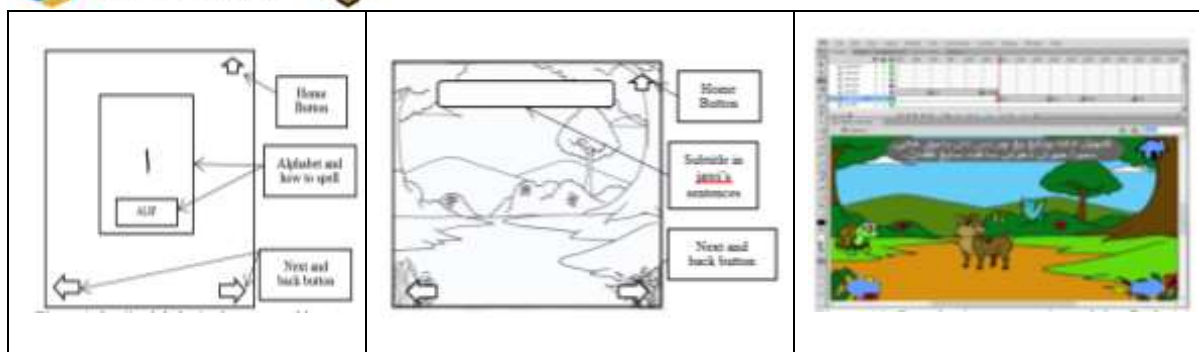


Figure 1 : The Storyboards

In the third phase of the development, is about the development phase. The application is developed based on the information of specification and requirement obtained from the design phase. Certain software has been used in the development process such as using Adobe Photoshop 6.0 as and Adobe Flash 6.0. In the implementation phase, the complete application will be testing to find out the error that might occur and improvements will be made. Then a survey was conducted to obtain feedback from users. The final phase is evaluate. In this phase the application will be assessed based on the capabilities and effectiveness of the application developed.

The application development is based on a few critical success factors to enhance student's learning experience. The factors that need to be considered was the use of attractive colour, the animation, graphic, the use of text and the use of audio. The first element is use of attractive colour. Colour is the important aspect after functionality in an application (Nick, 2017). The human and computer interaction is heavily based on interaction with Graphical User Interface (GUI) elements and colour plays as an important role in the interaction. The combinations of attractive colour were use in designing the interface to make user interested in using the application. Second element is the use of animation in the application. With the animation inserted in the application, it will bring out the scene that can attract more attention from user especially kids while using the application. With the animation, it looks like a character is alive and moving. It is much better than look at a static character without any movement. Moreover, learning through animation has no age limit and it can be used for early childhood, in primary and high schools, and even in universities (Lilian, 2015). Using graphic in the application help user in better understanding during the learning process and also help them easy to remember. For example, use the picture of an animal as a button and when user click the button it will show how to spell the name of the animal. Use of text is important and must be able for user to understand what we want to tell user to do. So, the size and the type of text uses must be suitable and understandable. The last element is audio. It is important to provide the non-boring atmosphere while using the application. The use of audio also help in presenting the information to user. Use of audio also can attract user when using fun and enjoyable audio. To validate this factors, we have some observation to the students while using the apps. Application testing is an investigation conducted to provide stakeholders with information about the quality of the application or software product or service under test. This test session was held at a pre-school located in Pekan Pagoh, Johor Malaysia, involving 18 students, aged range between 3 to 5 years old. Before this testing session, a demonstration session was conducted with students and teachers. After the demonstration, a test session was conducted by the teacher to test the effectiveness of the students in the learning session using the application compared to traditional learning. Example of demonstration session shown in Figure 12. As a result of the testing process for learning Jawi's writing is satisfying. Often, it is difficult for teachers to teach students but with 'Adik-Adik Jawi' application, students can learn more easily and appealing. Example of the application shown in Figure 13.



Figure 2: Example of demonstration session shown.

Analysis focuses on the level of effectiveness and convenience of users. As a result of the analysis, more than 90% of the pre-school students are interested in applications used due to the use of the application. This analysis shown at Figure 14. Accordingly, the application makes them more interested in using it (. Example of attractive animation in application shown in figure 15. This clearly shows that applications should be extended to pre-school. This proves that the app is suitable to attract students to the learning process. Improvements can be made so that these applications can be used as applications. It reinforces audio and improves the interface with more eye-catching colours.

Importance to education

The followings are some of the importance of Adik-Adik Jawi to education:

Students

- iv. It will help students to enhance their learning experience in Jawi
- v. Students will become more engaged with the subject and will be highly motivated to learn.
- vi. Embrace the student's skills on Critical thinking, problem solving, creativity and many more.
- vii. The values of patriotism in students will be increase.
- viii. First step towards reciting the Holy Al Quran

Teacher/Institution/Government

- iv. Helping the teacher to implement a new method of teaching Jawi.
- v. Increasing the teacher's passion on teaching Jawi.
- vi. Helping the institution to achieve higher performance in Jawi.
- vii. More people able to recite the Holy Al Quran and encouraged the understanding of Islam.
- viii. Supporting the government on *Pelan Pendidikan Tinggi Nasional, Dasar e Pembelajaran Negara* in terms of e Content
- ix. Helping the environment by reducing text book material (paper less).

Advantages of innovation towards education and community

Adik-Adik Jawi will help students to enhance their learning experience in learning Jawi. This is due to the fact that students will become more engaged and will be highly motivated to learn. On top of that, it will also embrace the student's skills on critical thinking, problem solving, creativity and many more positive

aspects. As a whole by having this innovation, students will have a new great perception on learning Jawi.

For the teachers, it will help the teacher to implement a new method of teaching Jawi. Via that, the teacher's passion on teaching Jawi will be increase. When students and teachers have been sparks with the positive environment it is believe the school / institution achievement and performance will also be increase.

As for the community, we will have a young generation with rich values of national and cultural identit. As a whole this initiative will support the government on *Pelan Pendidikan tinggi Nasional, Dasar e Pembelajaran Negara* in terms of e Content. Finally, least but not least, it will helps the environment by reducing text book material (paper less).

Commercial value

Adik-Adik Jawi can be commercialized to all preschool in Malaysia in order to help teacher and students implementing a new approach in teaching and learning Jawi. Furthermore, it will also available in Google Playsore and can also be embed with Augmented Reality (AR) signage in the text books.

Acknowledgement

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**ID NO. UTHM
007**
TOPIC:MYKUIZTORY: MELAKA (A HISTORY LEARNING APPS)

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Abstract: In 2017, Ministry of Education has implemented a new subject which is History into primary schools' syllabus to cultivate a sense of love and decent towards our country since at a very young age. The news was a taboo for the kids which lead to the increasing of the subject need to be taken at their school and become a curiosity to parents towards the ability of their children. The subject is to be taught starting from year 4 student in primary school. As history is considered as one of the hardest subject in school, therefore we develop an apps in order to help students learning history in a more interesting way. The apps had been developed based on ADDIE instructional design model. A satisfying result has been achieved with the increasing total number of the students that get correct answer in the post-test session as compared to pre-test session. For future enhancement, it is recommended for the school to encourage their students to install the application into their mobile devices.

Key words: please provide up to 5 keywords. Please try to stick to one line.

Content

Please address as many of the following sections as possible in your paper, as relevant.

Introduction

History subject is well-known with the challenges in reading and remembering the facts. The problem of lacking interest in learning history among students is not a new issue in Malaysia ("Mata pelajaran Sejarah membosankan, sampai bila?," 2017). This issue create worriedness especially when Ministry of Education Malaysia (MOE) include a history subject as the compulsory subject to be taken in Sijil Pelajaran Malaysia (SPM) examination starting in the year 2016. The negative perception towards history subject as compulsory subject to pass in SPM examination can be seen as the barrier to increase the patriotism spirit among new generation. Hence, MOE had implemented Malaysia Educational Blueprint (PPPM) 2013-2025 in which one of the effort to strengthen which had been labelled by the students as a boring and lack of commercial subject (Ministry of Education Malaysia, 2013). Seeing this unresolved problem, we had developed a history apps named MyKuizTory as a supportive learning tools to be chose by students especially the primary students. This apps was developed as one of the approach to motivate student to learn history in a more interesting way. MyKuizTory had been developed according to a Year 4 Unit 9: Parameswara Pengasas Melaka history textbook.

Description of your innovation

This educational app has two types of teaching approaches, quizzes and stories/notes. In the 'Main' section, there are quizzes made based on the Form 4 history textbook. Each set of questions has 10 objective questions. In the 'Belajar' section, there are 3 types of learning methods: animated stories, sound boards and simple notes. All the illustration in the apps are the hand-drawn images that turn to be animated graphics in the apps. Figure 1 shows some of the screenshot of MyKuizTory.



Figure 1: Screenshot of MyKuizTory

Background of the innovation

Among all subjects taught in school, history is often perceived as among the most boring subjects. One of the main reason probably why history has been considered as a boring subject is because of the traditional ways on how it is being taught in class. Typically, a teacher would just stand in front of all the students and start reciting all the details of the topics including all those many dates, places, names of prominent people and events that appear to be very challenging to memorize. The monotonous, seemingly non-active and non-participative way of teaching combined with all the many dates, names, places and events to preserve in mind are probably what make students think that history is a perplexing and challenging subject matter. However, this perception can be changed by trying to put effort on changing the way of how conventionally history subject were taught in class.

It basically depends on how the information being taught is being packaged. This just implies that similarly, the process of packaging or wrapping the information taught in history is what determines whether or not students will find it boring and tiresome. One of the way is to create inventive ways of discussing the subject matters either by making it extra participative or interactive so that students will get to take part of the discussion and not just stay as passive listeners- which makes the discussion boring. Therefore, the development of history apps in order to cultivate the student's motivation towards learning history can be considered of one way to make learning history more interesting.

Important to education

The important of MyKuizTory apps to education are:

- i. For assisting learners in revising their lesson.
- ii. Support learning across different context as their portability enables them to be used by learner in whichever context she or he is.

- iii. The developed apps focusing on ease of access, clarity and user-friendly features.
- iv. As an alternative learning aid in order to help students to adapt with the nature of learning history.

Advantages of innovation

- i. Easily understandable User Interface specially designed for learner needs. This will contribute to attract them to use the apps.
- ii. Simple presentation all the useful content. This make the apps easy to be used and to understand the content.
- iii. Alternative tools for learning history besides the implementation of conventional method.

Commercial value

As the history subject had become the compulsory subject to pass in SPM examination, hence MyKuizTory can be commercialized to all school student in Malaysia.

Acknowledgement (if any)

Special thanks to everyone especially the members of ICT as Enabler (iCAN) Focus Group who helped and contributed to making this project a fabulous success.

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**ID NO. UTHM
008**

**TOPIC: "Kiddo Disleksia Mobile Application: A Dyslexia
Screen Tool in Malay Language**

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Abstract: Identification of potential dyslexic among Malaysia student is crucial to ensure earlier intervention program able to given. Current practice in the Malaysian school system, screening test has been given based on teacher's observation and intervention. The low number of student enrol in special education indicate this task is difficult. It is due to untrained and lack of awareness regarding dyslexia among Malaysia teacher. Therefore, the easy, simple and accurate screen test tool are required. Kiddo Disleksia, a dyslexia screening tool based on mobile application has been designed and developed. The application exploits the uses of text, video, audio and graphic in multimedia to screen student with dyslexia based on visual and auditory. Kiddo Disleksia is developed by using Malay language as it's specifically develops for student in earlier learning to recognize and distinguish the alphabet. Besides, this application able to use as learning tool for dyslexia student to identify alphabet letter and phonic (alphabet sound). The mobile gamed based approach is used to screen the student with fun and innovative way. A usability study has been conducted towards 20 dyslexia students and result shows 85% of respondent feel the application able to help them learn easier. They agree that Kiddo Disleksia able to screen the dyslexia student with fun and easy way.

Key words: *Dyslexia, Kiddo Disleksia, Screen Tool, Malay Language.*

Introduction

In Malaysia, Ministry of Education recognized dyslexia as a kind of Specific Learning Disabled (SLD) and the students are included in special education program. Current practice in the Malaysian school system, screening test has been given based on teacher's observation and intervention. Identify dyslexia among student is proved difficult task. Enrollment statistic of SLD student at special education school is 53,617 students in 2016 which represent 1.05% of Malaysian student. The enrollment percentage is smaller than expectation since the expert estimate 5%-10% of population having dyslexia (Husni and Jamaluddin, 2009 ; Umar *et al*, 2011, Hassan *et al*, 2017).

International Dyslexia Association (IDA) define dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. Dyslexia is not disease and it doesn't have the cure. Earlier intervention is crucial to ensure early intervention program and support are given to them. Past researcher (Oga and Haron, 2012; Baily *et al*, 2015) indicate the lack of awareness of dyslexia among Malaysia and unexperienced teacher which may lead to misjudge student even before screen test given. Therefore, the easy, simple and accurate screen test tool are required.

Multimedia is proven as effective learning tool to SLD students. ICT technology like touchscreens, accelerometers, gyroscopes, voice recognition, sound reproduction, powerful processing and wide availability of mobile device are among tools that are very useful (Daud and Abas, 2013). The multisensory approach uses visual, auditory and kinesthetic is very helpful in teaching the learning disabled (Purkayastha et al, 2012). The same approach is applied to screen dyslexic student with fun and innovative way.

Methodology

At the beginning, it was understandable that for the design of such an mobile application, we needed to use good methodology design for development. Differentiating from the traditional software development methodologies, a combination of Addie Model provide sufficient development methods for software or application development cycle. Figure 1 show Addie model for software development.



Figure 1: Addie Model

Based on recurring analysis, design, and evaluation cycles, rather than a linear design processes, we gathered the results which occurred from the final evaluation and we were able to improve various elements of the application during its stages of development.

Design and Development

Kiddo Disleksia is developed as dyslexia screening tool based on mobile application. This application is developed for student in in earlier learning to recognize and distinguish the alphabet. Malay language is used in instruction to ensure students able to understand and react as per instruction. Kiddo Disleksia is suitable for student between age 5-10 years old. The application has following objectives i) to assist alphabet identification and phonic ii) to motivate dyslexic student to learn and read and iii) to screen dyslexic student in easy and fun way.

Letter identification is the first step for dyslexic student before they begin to read and write. The skill requires the children to recognize, memorize and repeat the process again, again and again. Kiddo Disleksia employs multimedia element such text, graphic audio and animation in letter identification and phonic blended with multisensory approach. Screen test for dyslexic student are desgined based on game approach. The students require to play alphabet games to distinguish the alphabet based on screen. With game based approach, student more concentrate and less pressure during the screen test.



Figure 2 : Kiddo Disleksia Interface Design

Result

A usability study has been conducted towards 20 dyslexia students at Special Education School Batu Pahat. From the result 85% of respondents feel the application able to help them learn easier. They also comment that they feel enjoy play game rather than been screening. Respondents also agree that the application able to give awareness to public about dyslexia.

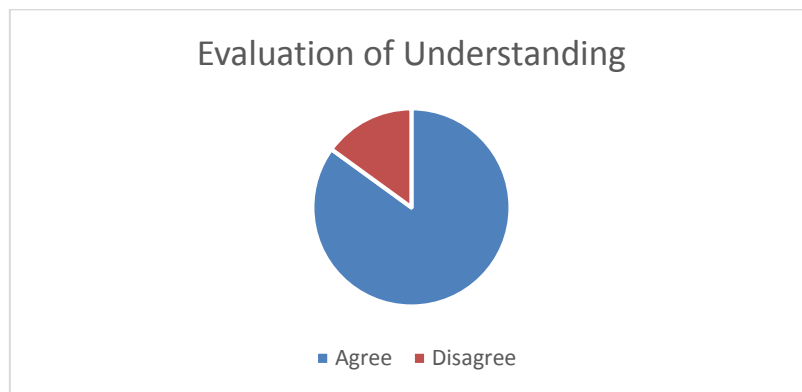


Figure 3 : Evaluation of Understanding for Kiddo Disleksia Application

The students with different levels of dyslexia indicated differences in the duration of each test, while the students with mild symptoms of dyslexia completed the tests much faster than the others. Also, the students with mild dyslexia demonstrated higher reading recognition and comprehension compared to the students who showed severe dyslexia symptoms. Those groups of students didn't differ significantly in spelling or listening.

Kiddo Disleksia able to commercialize as teaching tool, earlier learning tool and screen test tool to dyslexic student. It has potential for further research in the teaching and learning for dyslexic student. The innovative features of this application are:

1. Identification of alphabet and phonic.
2. Learning can be at anywhere and anytime.
3. Learning process more enjoyable and interactive.
4. Screen test are able to done at anywhere and anytime.
5. Screen test in fun and enjoyable mode.
6. App able to use to motivate and draw student attention.

Conclusion

Given the possible benefits of a smartphone or mobile application for children with different learning requirements, we dedicated on designing a mobile application which is focused at improving children's fundamental learning skills through the use of unconventional technology advancement (m-learning). We focused on developing a mobile application which could potentially substitute learning and

hopefully helping a children with their learning problems by cultivating some of their elementary skills, such as language abilities.

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ID NO. UTM 001
**TOPIC: Renewable Energy: Teaching and Learning using
a Novel Pico Hydro Turbine Kit**
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Abstract: A pico hydro turbine kit, which is an electric power generation system, has been developed specifically for the STEM-based education system. This turbine kit is built to give exposure to school students towards implementing science, technology, engineering and mathematics (STEM), specifically in hydropower renewable energy sources. Its small size, portable and maintenance-free allows this turbine kit to be easily used as a complete reference source in enhancing students understanding and interest on renewable energy sources. This turbine kit is equipped with a guidebook containing instruction in conducting simple and fun experiments, which are different from the existing experiments available at school. The pico hydro turbine kit is made from easily obtainable materials such as a water container as the turbine housing, turbine blades made from 1/2" pipes and a generator that can be purchased from local suppliers. It requires a head of 7-10 m and able to produce 30W power output. It only requires tap water as water source and can generate electricity for basic use such as lamps, televisions, laptops and mobile phones. The production cost is low compared to the existing imported products in the market. The pico hydro turbine kit has been successfully demonstrated in several programs in secondary schools from various states in Malaysia such as SMK Undang Jelebu, SMK DUSAJ, SMK Jelebu and SMK Triang Hilir from Negeri Sembilan, SK Intan Baiduri Kuala Lumpur and SK Bukit Marak, in Kelantan. The programs were conducted without involving high costs and participants are expected to share the knowledge acquired with other students as well. The duration of learning session is short, involving four sessions equivalent to 96 hours for all program components. From the feedback received, all students involved were excited to explore and experience the pico hydro turbine kit with interactive and fun learning activities.

Key words: Renewable, energy, STEM, pico turbine, teaching and learning

Introduction

Pico means a very small quantity that is smaller than a micro and denoting a factor of 10^{-12} in the measurement system. Pico hydro turbine means a very small turbine where the output power is below 1kW. Hydro turbine is a water machine used to generate electricity. The hydro turbine consists of several blades known as turbine blades made of corrosion resistant materials such as plastics and stainless steel. The pico hydro turbine kit produced by our researchers is a mobile power generating system developed specifically for the STEM-based education system. The pico hydro turbine kit is made from easily available materials such as water container as turbine housings, turbine blades from 45 degree bent pipes and generators that can be purchased from local suppliers.

The kit has five main components as follows;

- Turbine blades
- Jet nozzle
- Generator
- Inlet pipes

- Turbine housing

Product Features

The Pico Hydro Turbine Kit is equipped with a guidebook containing explanations on STEM concepts, fundamental of renewable energy, procedures of carrying out the experiments and an assessment tool to evaluate understanding and motivation of the students. The objectives of the pico hydro turbine kit are:

- 28. To provide students with knowledge in renewable energy.
- 29. To inculcate creative and innovative skills in design and development.
- 30. To provide students with hands-on experience in producing renewable energy.
- 31.** To understand water flow rate concept and electrical power generated using Pico Hydro Turbine.

Methodology

This fun and effective learning project has been planned to assist in strengthening the fundamental knowledge of science, technology, engineering and mathematics for Form Two students. Currently, four secondary schools in Jelebu District, Negeri Sembilan and two national schools in Kuala Lumpur and in Kelantan have been involved in this project. The list of schools involved in teaching and learning activities;

- Sekolah Menengah Undang Jelebu (SMKUJ)
- Sekolah Menengah Kebangsaan Dato' Musa Al-Haj (SMKDUMA)
- Sekolah Menengah Kebangsaan Dato Undang Syed Ali Al-Jufri (SMK DUSAJ),
- Sekolah Menengah Kebangsaan Teriang Hilir (SMKTH)
- Sekolah Kebangsaan Intan Baiduri Kuala Lumpur
- Sekolah Kebangsaan Bukit Marak Bachok Kelantan



Figure 1: Teaching and learning using Pico Hydro Turbine kit

Figure 1 shows the hands on application performed by the students during one of the sessions. Students are introduced to the concept of hydro renewable energy system prior to the hands on application.

Discussion

The development of pico hydro kit is aimed to motivate and encourage the students in learning the subjects of Science, Technology and Mathematics. The students are exposed to more fun teaching methods using experimental experiments. The module can be used as a reference to school teachers in the teaching of Science, Technology, Engineering and Mathematics.

Several advantages of the product are low cost, free maintenance; the turbine kit is also lightweight and portable. Commercial value in terms of marketability or profitability of the product innovation has been identified as potentially marketed to several parties such as the Orang Asli Community, the Orang Asli

Development Department (JAKOA), the Ministry of Education Malaysia, Primary and secondary schools, resorts and individuals.

Figure 2 shows the distribution of identified markets where Orang Asli communities in remote areas need electricity, data show 50% of Orang Asli in Peninsular Malaysia located in the remote or interior areas used oil lamps or generators. Each house will have this product to supply electricity to residential houses.

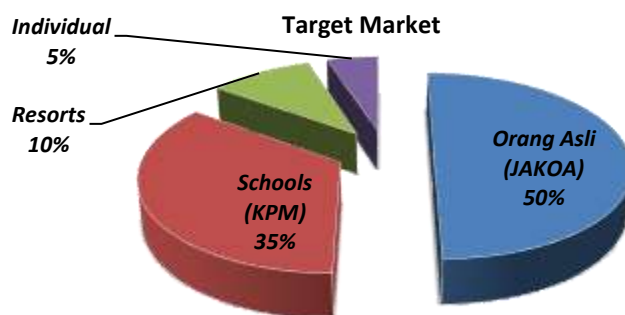


Figure 2: Data distribution for identified markets

This product has a market value because some of the factors that have been obtained from market surveys such as very low product cost, manufactured local, product is uniquely better, make things easier-plug and play. Table 1 shows the strategy used to plan the marketability of this product.

Table 1: Competitive Strategies



Conclusion

STEM education needs to be highlighted especially in primary schools to attract students to Science, Technology, Engineering and Mathematics. We should increase motivation among students in STEM and improve students' knowledge in STEM while at the same time provide interesting and effective teaching and learning environments. The teaching aid such as the pico hydro turbine Kit, is best suited for STEM learning to attract students especially primary and secondary students. The concept is learning and exploring the real tool while taking experimental data and interacting with group members. This innovative pico hydro turbine kit is also equipped with a handbook titled 'Renewable Energy STEM Education'. The content of this book covers Science subjects that relate to the topic of Scientific Skills, measurements, solar systems, energy, light, electricity, heat and technology. This book will help students to explore renewable energy, especially hydroelectric power generation systems such as hydro power. It also contains engineering topics where the Kit is used as a real tool on how an electric power station works. This kit can attract students to produce a simple tool that can generate electricity for daily use. To make pico hydro turbine an important brand in the field of teaching and learning that represents quality in electrification Renewable Energy we need to use high quality manufacturing and research, creative



marketing programs, and a comprehensive distribution network using retail outlets, internet presence, and catalogs.

Acknowledgement

This work is supported by the Razak Faculty of Technology and Informatics, GUP Tier 1 (Vote: 17H56) grants scheme and the Centre for Community and Industry Network (CCIN), Universiti Teknologi Malaysia, and in collaboration with UTM Ocean Thermal Energy Centre.

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ID NO. UTP 001
TOPIC: Learning Fundamental of Programming Through Robotic Approach
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Abstract:

Learning programming especially to new students who do not have any prior experience in coding can be a daunting tasks. Fundamental of Programming subject has been taught in traditional form mainly using input / output from screen without student fully understand the concepts in programming. The problems faced by students when they learn programming; they could not visualize how the programs works especially when it comes to sequence and repetition concepts, which lead to lack of motivation to learn programming. Currently, this course is taught using Pascal programming language in which this language is not interactive enough (students write the program, compile and run a black screen). Therefore, the objective of this research is to investigate the effectiveness of applying robotic in teaching the course. The idea is not to replace the existing course outline/syllabus but just to apply robotic in few lab sessions. For this research, simple line follower robot has been used as a learning tool. The robot application is simple, low cost, easy maintenance and hands-on approach will help students to learn programming in much more interactive ways. Study has also covered syllabus development and mapping to current course (Bloom's Taxonomy) to minimize cost and produce high impact to student learning outcome. The results showed this approach has increased students' motivation and their understanding of the tested programming concepts.

Key words: Programming, robotic, STEM education, teaching and learning
Content

Learning programming is very difficult to the new students who do not have any experience in coding. Fundamental of Programming, is a course taken by all students of Universiti Teknologi PETRONAS (UTP) including Engineering, Science and Technology streams in Foundation program. This course is very crucial for students to grasp the basic concepts of programming which will later been applied in their Undergraduate programmes. This course is currently taught in Pascal programming language where it involves program writing and later be tested and executed in input/output screen. Based on preliminary study conducted students could not visualize how the codes work, thus demotivate them from studying more advance concepts. Therefore, this project proposes the use of robotic approach in learning this course.

This innovation leverages the pre-programmed line follower Arduino-based robot called MBot. This robot is pre-programmed so that students will not have to understand on how to assemble the robot, thus they can focus more on how to apply the programming concepts and write the program to do certain tasks. The main goal of this innovation is to teach programming concepts instead of programming language. In reality, the concepts in programming are similar except for syntax (code). MBot is programmed using block program. Research shows that students in lower level of study (primary and secondary) could



understand programming concepts using thing approach. This finding motivates us to apply this approach to the Foundation students in our project to help them in improving their understanding and skills in programming.

This innovation is very important to our Malaysian education. Education in all levels including primary, secondary and tertiary are talking about Science, Technology, Engineering and Mathematics (STEM) education. Our government envision Malaysians to be the technology makers rather than the users of imported technological products. Programming is one of the important skills that needs to be equipped by the students to ensure their relevancy in the era of Industry Revolution 4.0 (IR 4.0). Most of the companies either from government or private have initiated the digital initiatives in improving their daily business process. They understand by adopting technology, their daily business process will be more efficient and even can reduce the costs. Therefore, programming skills are very important. Hence, we proposed an innovative way of learning this skill so that students could understand better and motivate them to learn more advance programming skills required by current and future job market.

This innovation comes with two deliverables which are learning module and robot design. In the learning module, there are four sub-modules included; Introduction & Basic Programming Structure, Decision Structure, Repetition Structure and Function. All these modules are designed following the Bloom's Taxonomy which is followed by most of the education institutions in Malaysia. For each single sub-module, different robot design is applied to suit the activities included. The first advantage of this innovation is that students could visualize how the codes work better (line-by-line) by looking at tangible robot movement and it can motivate the students rather than evaluating the program from input/output black screen. The second advantage is adaptability where the learning modules could also be used by secondary and primary level.

Originally, this innovation (learning modules) will be marketed only in UTP. However, this innovation should be eyed by many stakeholders who are very much interested in STEM education. Many people will benefit from this innovation either by individual or institutions such as Ministry of Education, Ministry of Energy, Science, Technology, Environment and Climate Change (formerly Ministry of Science, Technology and Innovation) and all STEM movers. Therefore, the commercialization of this innovation could be extended to all these parties.

ID NO. UUM001
TOPIC: AcaPro Gateway @UTLC
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Abstract: Malaysia as a nation that moves forward into a different world in 2050 require a major shift in governance services and educations. Academicians inspire learning, creating and sharing knowledge that form the backbone of Malaysia's knowledge economy. The important roles and vital contributions of academic staff and institutional leaders in Malaysia's Higher Learning Institutions are recognised in Shift 2 of the Malaysia Education Blueprint (2015-2025). This Shift highlights the importance of developing, nurturing and supporting Talent Excellence among academic staff and institutional leaders. Keeping academia talent into right pathway is a challenge faced by many universities. Therefore, it is important to know and understand the talent of academicians in their university, so that the management can plan for enhancing the academic talent. Academic Profiles (AcaPro) Gateways @UTLC is a web-based application that harnessing the powerful tools of data mining, data visualization and data analytics to assist in summarizing, visualizing, tracking and identifying academic talent development especially in teaching and learning track. This application offers a systematic way that capable to integrates data from various resources including teaching and learning data, student performance records, human resources data and lecturer training and workshop data. Currently AcaPro Gateway@UTLC offer a decision tree model to classify and label of academician track using web based predictive tools known as AcaPro Miner. AcaPro Miner capable to classify academician into certain teaching track as to provide future professional development and advancement opportunities for academia.

Key words: *teaching track, predictive modelling, inspiring lecturer, learning analytic*

Content

USEFULLNESS: AcaPro Gateway@UTLC has uniqueness especially in terms of the used of open source software that is platform-independent. One of the most significant advantages of this feature is its ability to move easily from one computer system to another. The ability to run the same program on many different systems is crucial to World Wide Web software. The algorithm developed with the AcaPro Gateway@UTLC tool is easy to integrate into various data mining software. This system can be utilized by most of the lecturers/academician at higher learning institution as the user interface for the system is easy to use and navigate. This application can help lecturers/academicians to understand their weaknesses and strengths in teaching and learning.

COMMERCIALIZATION POTENTIAL: The AcaPro Gateway@UTLC was developed using PHP and JAVA, which is open source software. Thus, it's capable to be integrated with various data mining software such as SAS Enterprise Miner, Python, WEKA and Clementine. AcaPro Gateway@UTLC has a very good potential to be commercialized, as it is practical to solve the problem of handling data in an integrated manner that a more systematic, paperless information can be documented in a massive form albeit easy access using technology which eventually reduces carbon footprint whilst providing economical alternatives to HE in Malaysia and possibly may be commercialized as an income generation to the local institution if not our country. By so doing this project could provide revenue for the nation.

Acknowledgement

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ID NO. UMK 016
TOPIC: Gamification Method in Teaching and Learning Retailing Management Subject
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Abstract: Nowadays, the use of gamification element in teaching and learning has become prevalent. Generation Y students are more receptive to this technique as it is easier for them to grasp the information either inside or outside of the classrooms. Due to this, a research on students' engagement has been conducted in order to compare between traditional method and gamification method of teaching and learning among 140 students at a public university in the East Coast of Peninsular Malaysia. The result indicates that students' engagement is higher when using gamification method. To put it in a nutshell, the use of gamification element has been proven to increase the students' interest in learning difficult subjects as well as improve the ability of lecturers to communicate information in a more efficient and effective manner.

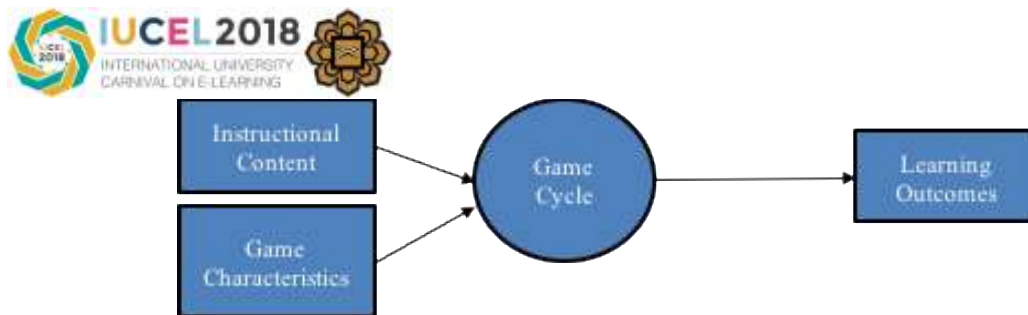
Key words: Gamification, Generation Y, Retailing Management, Teaching and Learning

1. INTRODUCTION OF INNOVATION

Teaching and learning in education industry has reached to the new method in terms of interaction and assessment. Gamification element is one of the new methods to enhance the students' engagement in class session (Nah, Zeng, Telaprolu, Ayyappa, & Eschenbrenner, 2014). In this study, positive engagement of students was found in terms of communication, engagement, interaction, involvement and participation. This finding managed to support a study by Hamari, Koivisto, & Sarsa (2014) which found that the students will get involve in class activities which are embedded with the gamification element. Therefore, the academicians should be creative in delivering teaching and learning method to ensure more participation (Bishop, 2014). Moreover, the world that we are living in is changing rapidly especially in the area of science, technology and economy. Hence, in order to put ourselves at par in the entire globe, one should be creative in all areas and become a reformist to cope with domestic, national and global problems (Tarman, 2016).

2. BACKGROUND OF INNOVATION

Implementation of gamification method has become popular and is being practically practiced among the academicians in the classroom environment (Hanus & Fox, 2015). Additionally, the application of gamification totally suits to the Generation Y within the class session (Iosup & Epema, 2014). The motivation model of this study was adapted from the Input-Process-Output model of serious game design (Garris, Ahlers, & Driskell, 2002). Practically, current teaching technique impacts the students' interest in the classroom. Thus, instructional content and game characteristics are the inputs to a recurring game cycle that will ultimately produce learning. Figure 1 shows the process of input-process-output model. Concurrently, this model has the potential value to be implemented in higher learning institutions in Malaysia by embedding gamification perspective towards a new approach in teaching and learning. This initiative will definitely steer the Generation Y as well students to get involve in class participation.



3. IMPORTANCE TO EDUCATION

Davis (1993) concurs that traditional lecturing is a one-way communication in which the student is a passive participant. As a matter of fact, lectures still remain as one of the most common higher learning educational approaches in college teaching (Mulryan-Kyne, 2010). Nevertheless, recent research found that traditional approach has been shifted to inculcate towards active learning (Su & Cheng, 2015).

A study conducted by Su and Cheng (2015) suggests that the gamified course led to greater students' engagement and participation in online course activities based on the number of downloads of the lecture slides and number of online posts (online discussions of class materials and online queries related to course content). Furthermore, Buckley & Doyle (2016) demonstrate through a research that a statistically significant increase in students' general knowledge of the national taxation system was found after the gamified learning intervention.

Due to that, an empirical survey was conducted at a public university situated in the East Coast of Peninsular Malaysia involving 150 students. The method of the survey started with one question which was asked to the students verbally. As a result, only a few of the student responds to the question. Subsequently, the students were asked once again by using the online discussion in Padlet application. At the end of the class session, the researcher ended up by using the Kahoot application so as to test the understanding level after the lecture session. Surprisingly, the engagement of the students increased to 98 percent compared to the previous method. The gamification element by Kahoot application further impacted the students' interest. Table 1 displays the result of students' engagement before and after gamification method.

Table 1: Students' Engagement Before and After Gamification Method

Assesment	Percentage
Before	5%
After	98%

4. ADVANTAGE OF INNOVATION

Prior studies reveal many potential advantages of gamification in education such as immediate feedback and productive learning (Gee, 2003). Furthermore, Connolly, Boyle, MacArthur, Hainey, & Boyle (2012) present a systematic literature review on game-based learning and serious gaming focusing on positive outcomes to the learning activities. Accordingly, many researchers conducted theoretical and empirical studies on gamification approach. Gamification in e-learning platform seems to have the potential to increase students' motivation and big effort is required in the design and implementation of the experience for it to be fully motivating for participants (Domínguez et al., 2013).

5. COMMERCIAL VALUE

This study manages to produce the model of gamification method that is very much suitable to be implemented by academicians regardless of disciplines in order to increase students' engagement and involvement in classrooms. The findings of this study have definitely verified the fact that by implementing gamification method, the perspective of delivering knowledge of retailing management subject has successfully changed from one-way communication to two-way communication that further supports the process of teaching and learning environment. This method certainly suits the characteristics of Generation Y students.

6. CONCLUSION

The use of technology influences students' engagement especially among the Generation Y. Specifically, gamification indeed plays a significant role in embarking the students' engagement and

interest in retailing management subject. Hence, the academicians should apply various techniques in teaching and learning which includes gamification method. This would undoubtedly enliven the teaching and learning process of any subjects.

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**ID NO.
UNIKL 002**

**TOPIC: MIXED REALITY E –LEARNING ANATOMY (MRLA) ON
HUMAN BODY**

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Highlights:

The purpose of this study is to create a Mixed Reality e-Learning Anatomy (MRLA) using 3D visualization anatomy of the human body structure in order which provides the conceptual learning process of affective, interactive, and more dynamic. Also, the Mixed Reality e-Learning Anatomy (MRLA) of the Human Body will transfer information and enable collaborative working, particularly in the field of Biology. This research will use ADDIE Model, which has been coherent with the instructional design model as an effective generic process traditionally to create dynamic learning content and user experience (UE). Overall, this research will hope to provide a better understanding of the convergence of tacit knowledge with new media technology especially using Mixed Reality and Anatomy studies.

Key words: Mixed Reality e-Learning Anatomy (MRLA), User experience (UE), 3D visualization, anatomy, dynamic

Purpose of the Study

The purpose of this study is to create a Mixed Reality e-Learning Anatomy (MRLA) using 3D visualization anatomy of the human body structure in order which provides the conceptual learning process of affective, interactive, and more dynamic.

Objectives of the Study

- To develop a prototype interactive application e-anatomy using Mixed Reality (MR) technology
- Providing immersive 3D Visualization and User Experience (UE) information related to anatomy using MR technology mediums as a new experience in learning environment.

Value Added (Important for Education)

- Providing immersive 3D Visualization and User Experience (UE)
- Immersive
- Among the pioneer on research medical studies (using MR) in Malaysia

Usefulness (Advantage)

- New method of learning
 - To provide a new experience of learning related to 3D visualization human anatomy.
 - Student more focus and providing a sense of immersive (MR).

- A new method for medical doctor or students to conduct experiments/operation
- Parallel with industry 4.0

Commercial Value

- UniKL
- Universiti Kuala Lumpur Royal College of Medicine Perak. (UniKL RCMP)
- Kementerian Pendidikan
- Kementerian Kesihatan

Acknowledgement

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ID NO.
UNIMAP 001

**TOPIC: Unpacking the Potential of Web 2.0 Tools for
Developing Culture of Thinking in Statistics Classroom**

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Key words: *statistical reasoning, statistical thinking, higher-order thinking, constructivist learning, technology-enhanced learning.*

Introduction

One of the arguments in statistics education was the traditional teaching approaches that focus on computations and procedural skills did not lead to students' reason and think statistically. In addition, the direct instructions in traditional statistics classroom did not foster active learning. Therefore, there is a need to design interactive classroom that promotes development of deep learning and opportunities for students to effectively engage with reasoning and thinking process. To move away from the traditional approach and emphasize on students' ability to reason and think with statistical information have open-up possibility of integrating technology within content instructions. In this project, four Web 2.0 Applications were applied to introductory statistics class for engineering students at Universiti Malaysia Perlis. The classroom instructions were carefully designed to enrich students' learning experiences and at the same time to achieve the learning outcomes with the support of these four tools. These blended learning instructional designs are given as in Table 1.

Table 1: Applications of blended learning in statistics classroom.

Web 2.0	Types of Usage and Advantages
	Upload files, videos, student's homework, think-pair-share thinking routine activity, make announcement, post learning outcomes notes. Easy access through mobile phone. Enable communication inside and outside of classroom.
	Usually used at the beginning of the class to evaluate conceptual understanding and encourage discussion. It is useful for students to reflect upon the materials and adjust the learning accordingly.
	Provide questions for self-assessment on certain topic before conducting formal formative assessment.
	Excellent tool for making students' thinking visible. Allows interactions and encourage peer-to-peer learning. Introvert students found that this approached build-up their confidence.

These blended learning strategies open-up the avenue to culture of thinking (CoT) classroom. To reason and think statistically, students need to demonstrate strong conceptual understanding. Therefore, establishing CoT classroom facilitated by technology provides environment where students' thinking are visible, promoted and valued. The 21st century learner requires diverse instructional strategies that

facilitate development of content knowledge constructively and foster deeper understanding. The interactive learning space, students' voices be heard and highly engagement with students' thinking empower and prepare students toward self-directed and self-regulated learner.

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ID NO. UPM 029
**TOPIC: INNOVATIVE TEACHING APPROACHES IN BIOLOGY
EDUCATION FOR PROMOTING SUSTAINABILITY**

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Abstract

Studying biology is considered difficult and bound to be boring if read from textbooks. Taxonomy and anatomy tend to be very terminology-rich, and overloaded biology curricula lead the student to learn the material through memorization. In addition, traditional teaching approaches decreasing their interest in biology. To overcome this obstruction, various efforts have been made to improve the science teaching especially using technology approaches. However, technology alone will not enhance learning, but using it as part of good teaching practice can open new doors to learners. Thus, the present study intended to evaluate the effect of innovative teaching strategies for plant biology subjects using system 3D model incorporated with technology approaches in classroom lessons. The system 3D model serves as useful way of communicating critical features of the plant parts and integrated with the inventive digital learning attempted to introduce realistic and meaningful innovative teaching approach especially for Generation Z. This implemented teaching innovation was assessed through task based performance. Furthermore, a survey based on Innovative Teaching Strategies Questionnaire (ITSQ) was conducted to obtain the students' perception on the teaching innovation. The finding revealed, the educators were not passive recipients of these pedagogical tools and the proposed teaching strategy has a positive impact on the performance of students' diversity. The results are found to be significant in favour of these innovative teaching methods. This teaching approach makes learning interesting and allowed for fast and efficient lessons delivery both in classroom and field. Generally, this innovative teaching approach encompasses the students to value the environment and to understand the science behind the great ecological dilemmas together prepare the students to grapple with the interdisciplinary nature of 21st century problems.

Key words: *Plant Biology education, education for sustainable development, system 3D model, teaching innovation, experiential learning*

Introduction

Biology is a unique discipline that provides knowledge of all forms of life. Student thinks biology lessons are boring, confusing or difficult if read from textbooks. Students' difficulties in learning biology have been studied by various researchers from all around the world (Lazarowitz and Penso, 1992; Bahar et al., 1999; Cimer, 2012). Many topics in biology, especially taxonomy and anatomy tend to be very terminology-rich, and overloaded biology curricula lead the student to learn the material through memorization. This technique is not an effective approach and prevents meaningful learning. Experiencing difficulties in biology topics especially in plant biology subjects, negatively affects students' motivation and preventing them from learning biology effectively. Students' difficulties in understanding biology have encouraged researchers to investigate what are the reasons for difficulties and ways to overcome those difficulties. There were many reasons have been identified in why students facing difficulties in learning plant biology subject. The uttermost important reasons were nature of science which overloaded with complex terminology and its teaching techniques (Cimer, 2007). Teaching biology topics in traditional way (face-to-face learning) may ignore students' interests and expectations cause several learning

problems as well as decreasing their interest in biology (Zeidan, 2010). Diminishing interest in learning science was due to lack of visualization and understanding of the mechanisms. From the above review, there appears to be clear needs for further insight into improve the quality of teaching and learning that can help students learn biology better. Therefore the aim of the present study is to improve the science teaching using system 3D model incorporated with technology approaches. This innovative learning technique in plant biology subjects is in-line with Generation Z students' learning needs.

Research question

An important question concerning biology education is how to teach plant biology topics incorporated with technology in an interesting way and they can promote sustainability.

Methodology

Research design

With the increased focus on enhancing teaching and learning, inquiry about student learning has become primary concern in higher educations. The Scholarship of Teaching and Learning (SoTL) is an emerging movement of scholarly thought and action that draws on the mutual relationship between teaching and learning (Boyer, 1990). It is a systematic reflection and investigation of our classrooms. An important goal of SoTL is to enhance and augment learning and between individual learners by investigating the many features of discipline specific expertise and best pedagogical practice (McKinney, 2006). There are many models have been published regarding this Scholarship of Teaching and Learning (SoTL). However, I have adopted model of Trigwell and Shale (2004) and modified to be used in my classroom. The SoTL research that have implemented includes five interrelated teaching components; i.e., Planning, modifying, assessing, reflection and sharing. The modifying element in the present study is innovative teaching strategies for plant biology subjects using system 3D model incorporated with technology. Basically, this study was carried out with a mainly quantitative research approach.

Participants

The participants were first year students of Diploma in Agriculture. They were total of 85 student's age ranged 19-22 year old were participated in this experiment. The demographic information of students is presented in Table 1.

Table 1: Demographic Profile of Respondents (n=85).

Item	Frequency	Percentage
Gender		
Male	34	40.00
Female	51	60.00
Previous background		
SPM	61	71.76
Pre-Diploma	5	5.88
STPM	2	2.35
Certificate	17	20.00

Data collection

A survey based on Innovative Teaching Strategies Questionnaire (ITSQ) was conducted to obtain the students' perception on the teaching innovation. The questionnaire used in this study contain 16 questions categories into 4 main factors; learnability, fun, motivation and usefulness. The students were assessed the questions with scale of 1–5. Scale 1 represent strongly disagree, Scale 2- disagree, Scale 3- Neutral, Scale 4-Agree and Scale 5= strongly agree.

Data analysis

The responses to question were analyzed quantitatively to identify descriptive statistics. Descriptive statistics were used to determine the frequencies as perceived by the students.

Results and Discussion

Finding revealed, the educators were not passive recipients of these pedagogical tools and the proposed teaching strategy has a positive impact on the performance of students' diversity. The students' reflection of the approached techniques using system 3D model incorporated with technology is presented in Figure 1. Students respond based on 16 questions were summaries into four main factors including learnability, fun, motivation and usefulness.

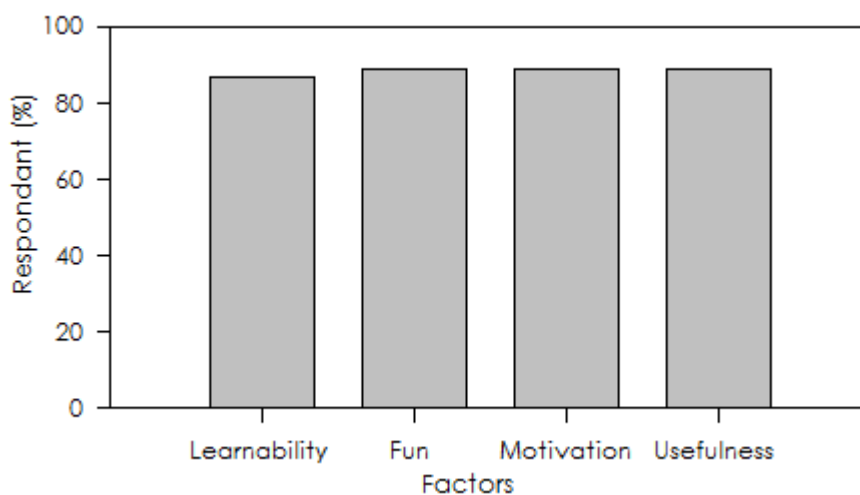


Figure 1: Students' reflection based on the applied innovate teaching method.

Generally, out of 85 students, 88% of them accept this technology based teaching method with Scale 5. Approximately 85% of the students responded that this technique make them easily understand the plant anatomy and structure without memorization. Many students in the study revealed that nature of biology forces them to memorize the facts in order to learn them. Several studies of Turkish biology teachers and students (Bahar, 1999; Çimer, 2007) have reported that memorization is common among students as a biology-learning strategy. When the teaching method involved visual materials, example 3D models, they can visualize the plant structures easily and able to understand the mechanisms clearly. This makes their learning in biology effective. Study through visualize materials able to make them connecting the topics with daily life. According to Cimer 2007, learning materials including models, computer simulations, videos, and real-life objects, both the teaching and learning of biology may become more effective. Because they defined effectiveness in learning as "retention of knowledge for a long time", they expressed that teaching biology through visual materials and tools helps them retain biological knowledge for a long time and thus remember or recall the information much more easily.

Apart from that students revealed that study biology is too boring. One reason for this choice might be the way biology is taught. Biology lessons are generally carried out through teachers' lectures and can be identified as teacher-centered lessons. Using this traditional way, students showed lack of interest in the classroom. Generation Z students learn better through digital technologies. This cohort is considered to be true digital natives, growing up with mobile devices, tablets and laptops. Thus, they much preferred learning through technologies then pen and paper. In-line with this fact, the present approached using technology in learning biology has attracted the students to learn in fun way. 88.99% of the students have responded that this innovative technique is fun while leaning. Based on the observation, when the students learn the topic through technology and share the knowledge with their friends, they were energetic and *enthusiastic* in the classroom. This method also have encourage the student learn beyond the syllabus. When the assessment have been conducted using high order thinking skill questions, the students able to find detail information on the subjects and explain in detail on what they have learned. This motivates them to lean the biology effectively. Besides, 88.90% students have responded that the present approach is also useful for them in learning the biology subjects. This strongly emphasizes that in

learning materials or skills, students should be given extensive opportunities to manipulate the environment because, students' cognitive structures will grow only when they initiate their own learning experiences (Cimer, 2012). Therefore, the participants suggested that teaching through visualization incorporated with technology make biology teaching and their learning more effective. Thus the present innovative approached have making the students learning in biology effective and also suggested that students use various study techniques in order to be successful in biology.

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ID NO.:
UPNM 001
**TOPIC: HUMAN COMPUTER INTERACTION PRINCIPLE –
DESIGNING WITH THE MIND IN MIND**
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Abstract: The Human Computer Interaction was developed to support the learning and teaching process on how to design users' interface application and interaction involved in technologies. By understanding the techniques such as the rapid prototype design, the learners can implement it during the prototype development. Besides that, the learners will be leveraging with knowledge acquisition on how to gather meaningful feedback from end users then evaluate it. Learners also will learn the principles and rationale of visual design selection; perception and cognition of learners and manipulation of informative feedback that comes from users. This may give an effective contribution towards interaction design.

Key words: *Human Computer Interaction, User Interface Design, Interaction*

Content

Computer technology has evolved to suit the human usage. The way for human to interact with the computer is by the medium of User Interface (UI). The first ever interface that human used to interact with computer was Batch Computing. It consisted of the input of a punched card. Thus, humans had no interaction with these early batch computers in real time. Then the UI changes to Command-Line (CL) that provides real time interaction by having request-response transactions. From CL, the interface gradually evolved to what UI look likes nowadays which is Graphical User Interface (GUI). The main purpose of GUI is to provide a user-friendly or human-centered usage of computers. Thus, the term Human Computer Interaction (HCI) is coined. HCI is focusing "on the snapshot of the interaction at the moment, usually focused on an individual, centered on the human-machine dyadic relationship itself." (Kuutti, K., & Bannon, L. J., 2014). Thus, to expose the students with HCI, a course about HCI was created.

This HCI course is included as one of the National Defence University of Malaysia's (NDUM) Massive Open Online Course (MOOC) subjects that can be viewed on OpenLearning's website as shown in Figure 1. All the content can be viewed online by just registering to the website and enrolled to the course. The main objectives for this course are to introduce some of the fundamental concepts, principles and guidelines concerning in designing the effective interface in application or system development. Besides that, this HCI course introduced students with the aspects of user-centered design process besides usability principles and evaluation. With the guidelines, the students can have the idea to develop a better HCI for any given system as sustainability is a bane to HCI (Silberman et al, 2014)

There are several benefits of learning this course. Firstly, to produce students with preferred way of interactive online learning. Students also be benefitted with the way of learning by connecting and sharing knowledge together. Furthermore, the modules are provided with the elements of multi-fusion such as video, animation, graphics and interaction to enrich learning process. Lastly, this module also leveraging the student of GEN-Z onwards to collaborate amongst themselves. With all the knowledge acquired, students can either update the existing UI of a system or they can also develop a new system that is user-friendly that well-equipped for future technology. As said by Vines et al (2015), the developing a new system is also a configuration for the user.

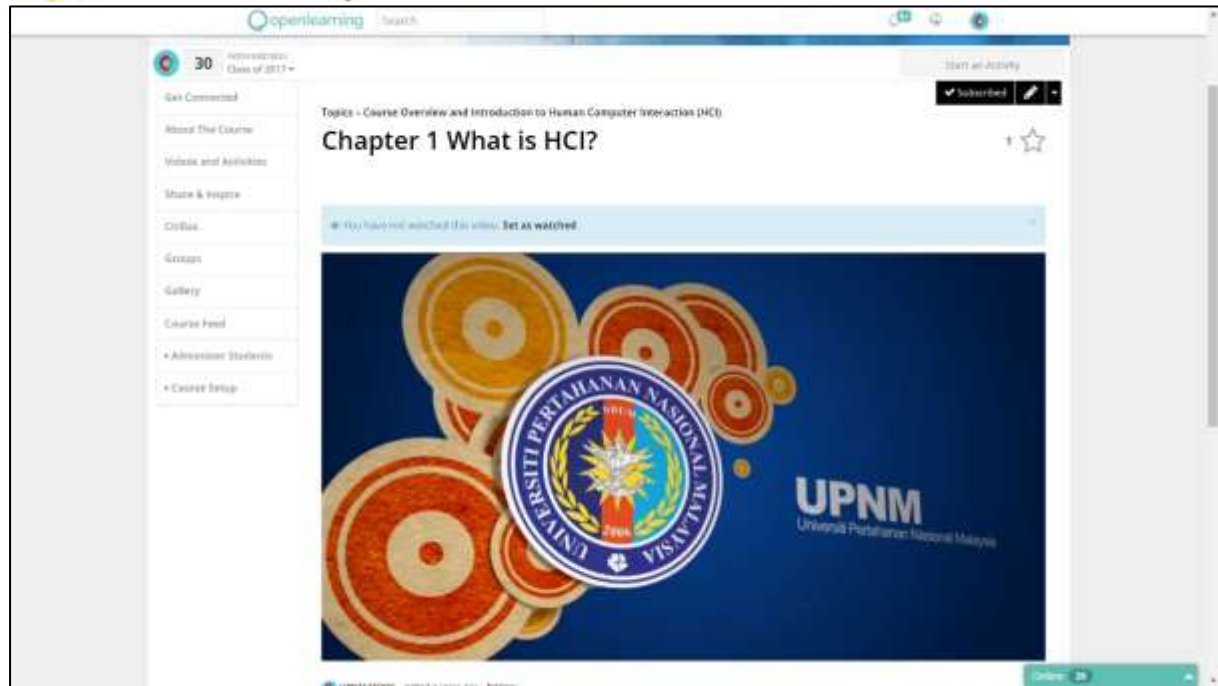


Figure 1: Interface of the HCI's MOOC webpage

This innovation also has several recognitions for this course. The highlight is a Gold medal e-Learning Carnival (eLC) Universiti Teknikal Melaka (UTEM). There are two Bronze medals won, the first was at e-Content Development (eCondev) Universiti Teknologi Mara (UiTM) and the latest at International University Carnival on E-Learning (IUCEL) that was held in Universiti Sains Islam Malaysia (USIM) on 2017. Currently, the innovators are working on Intellectual Property (IP) status as this innovation have a potential in the future undertaking and commercialization purpose.

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ID NO.: USIM 012
TOPIC: ArabISTB – Online Learning of ARABIC APPLIED GRAMMAR (NAHU WAZIFI)

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Abstrak

Pembelajaran Nahu Bahasa Arab sering dikaitkan kaedah pengajarannya dengan kaedah yang tradisional dan klasik. Kaedah ini, seperti mana sedia maklum, pada hakikatnya adalah satu kaedah yang tidak *up-to-date*, membosankan menyebabkan objektif pembelajaran yang dirancang tidak dapat dicapai. Dengan demikian, pembinaan ArabISTB telah memberi nafas baru terhadap pembelajaran Tatabahasa Bahasa Arab secara terbuka di atas talian dengan paparan yang mudah, menarik dan Jimat. ArabISTB adalah modul pembelajaran Nahu Bahasa Arab secara atas talian yang boleh digunakan oleh pelajar di peringkat menengah dan universiti. Ia menggunakan *website Open Learning* sebagai medium pesentasi Nahu Bahasa Arab At Tawabe'. Modul ini telah dibangunkan dengan menggunakan beberapa platform yang variasi seperti: kahoot, weebly, Prezi, Quizcreator, playposit, ARVR, go animate, powtoon dan lain-lain. Pembangunan ArabISTB ini adalah dengan tujuan untuk memaksimumkan kemudahan teknologi dalam pendidikan terkini agar ia dapat dipelajari oleh siapa sahaja dengan masa dan tempat yang fleksibel serta pemudah cara pembelajaran yang kontemporari. ArabISTB Mempunyai ciri-ciri yang menarik agar dapat menarik minat pelajar untuk belajar Nahu Bahasa Arab.

Kata kunci: Nahu Bahasa Arab, *Arabic online learning*, at-Tawabe'

KETERANGAN INOVASI:

ArabISTB adalah modul pembelajaran secara atas talian yang menggunakan *website Open Learning* yang fokus kepada Tatabahasa Bahasa Arab untuk topik Tawabe'. Modul ini telah dibangunkan dengan menggunakan beberapa platform yang variasi seperti: kahoot, weebly, Prezi, Quizcreator, playposit, ARVR, go animate, powtoon dan lain-lain. Ia bertujuan menarik minat pelajar untuk belajar Nahu Bahasa Arab secara atas talian.

ArabISTB mengandungi beberapa halaman yang terdiri dari muka hadapan, pengenalan modul, video pengenalan, Nota, keterangan, gambarajah, lukisan, latihan, ujian dan penilaian. Setiap modul akan diakhiri dengan latihan dan penilaian.



ArabISTB sesuai digunakan oleh pelajar diperingkat menengah atas dan universiti. Menggunakan 3 bahasa (Melayu-Inggeris dan B.Arab). Web ini dibina dengan tujuan membantu pelajar untuk belajar Tatabahasa Arab di mana-mana berada. Dengan tagline “**MAHIR BAHASA ARAB CEPAT**” di harap modul online ini menjadi pilihan utama dikalangan pelajar dan pensyarah dalam mengendalikan Pdpc bagi subjek Nahu di sekolah dan universiti.

LATAR BELAKANG INOVASI:

Pembelajaran Nahu Bahasa Arab sering dikaitkan kaedah pengajarannya dengan kaedah yang tradisional dan klasik. Kaedah ini, seperti mana sedia maklum, pada hakikatnya adalah satu kaedah yang tidak *up-to-date*, sangat membosankan serta objektif pembelajaran yang dirancang tidak dapat dicapai. Dengan demikian, pembinaan ArabiSATB telah memberi nafas baru terhadap pembelajaran Tatabahasa Bahasa Arab secara terbuka di atas talian dengan paparan yang mudah, menarik dan Jimat. Seiring dengan perkembangan teknologi terkini. Pembelajaran Bahasa Arab juga tidak ketinggalan apabila mampu menyahut cabaran Pendidikan di era IR4.0 ini iaitu dengan membangunkan modul atas talian yang eksklusif dan menyeluruh. Tatabahasa Arab sering menjadi masalah kepada bukan penutur jati untuk mempelajari Bahasa Arab. Kini ArabiSATB adalah pengenalan kepada salah satu modul atau tajuk Tatabahasa Bahasa Arab yang akan difokuskan dalam *Online Learning*.

ArabISTB adalah modul pembelajaran secara atas talian yang menggunakan *website Open Learning* yang fokus kepada Tatabahasa Bahasa Arab untuk topik Tawabe'. Modul ini telah dibangunkan dengan menggunakan beberapa platform yang variasi seperti: kahoot, weebly, Prezi, Quizcreator, playposit, ARVR, go animate, powtoon dan lain-lain. Ia bertujuan menarik minat pelajar untuk belajar Tatabahasa

KEPENTINGAN TERHADAP PENDIDIKAN:

Bahasa Arab adalah Bahasa kedua selepas Bahasa Malaysia. Dengan demikian ArabISTB ini dapat membantu pelajar:

- 1- Mempelajari Bahasa Arab secara online dengan paparan screen yang mudah difahami.
- 2- Menarik minat pelajar untuk mempelajari dan mahir Nahu Bahasa Arab.
- 3- Melatih pelajar menggunakan Bahasa arab dalam situasi Bahasa kedua.
- 4- Membentuk syahsiah seorang pelajar atau individu yang fasih Bahasa arab dan cendiakawan.

KELEBIHAN INOVASI:

Inovasi ini mempunyai keunikan dan asli. Bercirikan online, mudah diekses dan presentasinya sangat menarik dengan menggunakan platform-platform yang variasi agar hanya dapat menarik minat pelajar untuk mempelajari Nahu Bahasa Arab. Aktiviti-aktiviti yang pelbagai bagi membina kemahiran Nahu Bahasa Arab serta latihan pengukuhan dan ujian bertahap telah disediakan untuk menguji kemahiran pelajar secara atas talian. Pelajar akan di nilai dan diberi sijil setelah tamat kesemua modul ArabISTB ini.

NILAI PEKOMERSIALAN:

Bahasa Arab adalah Bahasa AlQuran, adalah Bahasa yang kedua tertinggi bilangan penuturnya di dunia, Keunikan Bahasa ini dan keasliannya menarik minat ramai untuk mempelajarinya. Dengan keadaan situasi dan kemampuan yang terhad, menyebabkan ramai yang tidak dapat mempelajari

Bahasa Arab. Dengan demikian ArabISTB adalah salah satu option yang boleh digunakan untuk mempelajari Bahasa Arab. 1/3 penduduk dunia adalah beragama islam, dengan demikian kepentingan Bahasa arab dalam kalangan masyarakat islam amatlah tinggi. Nahu bahasa Arab adalah elemen penting dalam yang perlu difahami semasa mempelajari Bahasa Arab.



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ID NO. UTP 001
TOPIC: Learning Fundamental of Programming Through Robotic Approach
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Abstract:

Learning programming especially to new students who do not have any prior experience in coding can be a daunting tasks. Fundamental of Programming subject has been taught in traditional form mainly using input / output from screen without student fully understand the concepts in programming. The problems faced by students when they learn programming; they could not visualize how the programs works especially when it comes to sequence and repetition concepts, which lead to lack of motivation to learn programming. Currently, this course is taught using Pascal programming language in which this language is not interactive enough (students write the program, compile and run a black screen). Therefore, the objective of this research is to investigate the effectiveness of applying robotic in teaching the course. The idea is not to replace the existing course outline/syllabus but just to apply robotic in few lab sessions. For this research, simple line follower robot has been used as a learning tool. The robot application is simple, low cost, easy maintenance and hands-on approach will help students to learn programming in much more interactive ways. Study has also covered syllabus development and mapping to current course (Bloom's Taxonomy) to minimize cost and produce high impact to student learning outcome. The results showed this approach has increased students' motivation and their understanding of the tested programming concepts.

Key words: *Programming, robotic, STEM education, teaching and learning*

Content

Learning programming is very difficult to the new students who do not have any experience in coding (Combefis, Beresnevicius, & Dagiene, 2016). Fundamental of Programming, is a course taken by all students of Universiti Teknologi PETRONAS (UTP) including Engineering, Science and Technology streams in Foundation program. This course is very crucial for students to grasp the basic concepts of programming which will later been applied in their Undergraduate programmes. This course is currently taught in Pascal programming language where it involves program writing and later be tested and executed in input/output screen. Based on preliminary study conducted students could not visualize how the codes work (Ahmad Rizal, Mohd Yusop, Abdul Rasid, & Mohamad Zaid, 2011), thus demotivate them from studying more advance concepts. Therefore, this project proposes the use of robotic approach in learning this course.

This innovation leverages the pre-programmed line follower Arduino-based robot called MBot (Kusuma & Utaminingrum, 2018). This robot is pre-programmed so that students will not have to understand on how to assemble the robot, thus they can focus more on how to apply the programming concepts and write the program to do certain tasks. The main goal of this innovation is to teach programming concepts instead of programming language. In reality, the concepts in programming are similar except for syntax (code). MBot is programmed using block program. Research shows that students in lower level of study (primary and secondary) could understand programming concepts using thing approach (Misirli & Komis, 2014). This finding motivates us to apply this approach to the Foundation students in our project to help them in improving their understanding and skills in programming.

This innovation is very important to our Malaysian education. Education in all levels including primary, secondary and tertiary are talking about Science, Technology, Engineering and Mathematics (STEM) education. Our government envision Malaysians to be the technology makers rather than the users of imported technological products. Programming is one of the important skills that needs to be equipped by the students to ensure their relevancy in the era of Industry Revolution 4.0 (IR 4.0) (Edy Hafizan, Ihsan, & Lilia, 2018). Most of the companies either from government or private have initiated the digital initiatives in improving their daily business process (Kane, Palmer, Phillips, Kiron, & Buckley, 2015). They understand by adopting technology, their daily business process will be more efficient and even can reduce the costs. Therefore, programming skills are very important. Hence, we proposed an innovative way of learning this skill so that students could understand better and motivate them to learn more advance programming skills required by current and future job market.

This innovation comes with two deliverables which are learning module and robot design. In the learning module, there are four sub-modules included; Introduction & Basic Programming Structure, Decision Structure, Repetition Structure and Function. All these modules are designed following the Bloom's Taxonomy (Munzenmaier & Rubin, 2013) which is followed by most of the education institutions in Malaysia. For each single sub-module, different robot design is applied to suit the activities included. The first advantage of this innovation is that students could visualize how the codes work better (line-by-line) by looking at tangible robot movement and it can motivate the students rather than evaluating the program from input/output black screen. The second advantage is adaptability where the learning modules could also be used by secondary and primary level.

Originally, this innovation (learning modules) will be marketed only in UTP. However, this innovation should be eyed by many stakeholders who are very much interested in STEM education. Many people will benefit from this innovation either by individual or institutions such as Ministry of Education, Ministry of Energy, Science, Technology, Environment and Climate Change (formerly Ministry of Science, Technology and Innovation) and all STEM movers. Therefore, the commercialization of this innovation could be extended to all these parties.

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