

EXPLORING STUDENTS' LEARNING STYLE THROUGH FLIPPED CLASSROOM METHOD

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Abstract

Technology has changed many of educators' teaching patterns. The use of technology in teaching and education has long been applied since time immemorial. Technology, to some extent, has also affected educators' teaching methods and this gave rise to the emergence of a number of pedagogical methods, such as blended learning and flipped classroom, which resulted from the integration of technology with traditional methods. Hence, many studies related to pedagogy, including flipped classroom have been conducted at the University and school levels. However, based on previous studies, effective educators' teaching methods should be consistent with the learning style of students. Although flipped classroom methods have been widely studied, not many emphasized on students' learning styles in flipped classroom methods. Only a handful of the researchers emphasized on students' learning styles in flipped classroom methods. This research will discuss previous studies about the needs and issues of students' learning styles, especially in the flipped classroom teaching methods. In addition, this paper will also briefly comment on in-class activities studied by previous researchers. Finally, the authors will state the learning styles and activities incorporated into the study. However, the survey data cannot be reported since the data collection process is still ongoing.

Keywords: Flipped Classroom; Learning style; Project based learning; Technology.

1 INTRODUCTION

Flipped classroom is also known as inverted classroom or reversed classroom. Although different in terms, it refers to the same pedagogical methods. Flipped classroom method was first introduced as early as in year 2000 [1]. This pedagogical method uses technological cutting edge in teaching and learning. Flipped classroom learning consists of two phases. During the first phase, students will be provided with digital materials for reference and guide prior to the actual class. The use of technology takes place in the first phase when students access information from the Internet either in the form of video, audio, podcast or any educational portals such as Khan Academy, YouTube, Coursera and TED talks. These educational portals provide a variety of materials that can be used in teaching and learning. There are also researchers who provide material in the form of CD, pen drive and DVD to avoid problems such as lack of computer and slow information access [2]. Therefore, in the second phase of the flipped classroom, students will do in-class activities based on initial readings made by self-learning through the first phase of the flipped classroom. Since students have been exposed to the initial learning in Phase 1 of flipped classroom, more time in the classroom can be used by students to do hands-on activities with their peers under the guidance of educators [2], [3]. According to [4], hands-on approach in the classroom may enhance students' interest in the subject being presented. Past studies have also shown that the flipped classroom is feasible for basic and complex subjects [5].

However, [6] found that the implementation of the flipped classroom for students who have not mastered certain subjects makes them feel uncomfortable. Nevertheless, the problem of inconvenience felt by the students could be overcome by the educators since they have the opportunity to be together much longer in class activities. In addition, there are also researchers who developed map concept as an initiative to help students learn subjects through visual aids diagrams [7]. The flipped classroom method also allows educators to identify and rectify students' misconception immediately [8], [9].

2 REVIEW ON PUBLISHED FLIPPED CLASSROOM

It is obvious from previous studies that, the flipped classroom method has become a field for the educators to diversify their teaching methods, because flipped classroom is beneficial in fulfilling students' learning styles. This finding is supported by [8] who stated that diversified teaching methods by educators help students to learn more meaningfully. Although, based on previous studies, there

were a number of researchers who proposed the application of learning styles in the flipped classroom method [8], [10], [11], researches which apply students' learning styles in flipped classroom method such as that implemented by [13] are still lacking. Whereas, the educators' teaching methods and students' learning styles are interrelated and they must be synchronized to ensure that students' learning takes place well [11], [12]. Table 1 shows the studies about flipped classroom based on in-class activities and students' learning styles.

TABLE 1

Author(s)	In Class Activities	Learning Style
[8]	Group project	Felder-Solomon
[10]	Inquiry based learning	None but strongly suggested
[11]	Group work	None but strongly suggested
[12]	Opinion based queries	Myers-Brig
[13]	Open ended problem solving	Kolb
[14]	Team based learning	None
[15]	Cooperative problem based learning	None
[16]	Project based learning	None

Based on Table 1, it clearly shows that the number of authors who apply the elements of learning style is very limited. Although [8], [11], [12] touched on students' learning styles and recommended the application of learning styles elements in flipped classroom, the explanation provided is fairly basic and not too detailed.

2.1 Learning Style

Table 1 shows the previous studies on flipped classroom based on learning styles with focus on in class activities. [8] implemented flipped classroom methods to a group of engineering students at a University. This research by [8] involved a large group of undergraduate students. The research findings revealed that, for a study involving a large sample, only half of the total number of students preferred to continue with the flipped classroom methods. The other students preferred the traditional methods. However [8] stated that the flipped classroom has the potential and is beneficial to students who enjoy the learning style of learning environment type. According to [17] and [18], students classify their learning according to four types of domain dimensions, namely:

- 1) Active / reflective
- 2) Sensing / intuitive
- 3) Visual / verbal
- 4) Sequential / global

Through the flipped classroom methods, [8] believes that students can learn more effectively if they learn in a learning environment that they like as contained in the flipped classroom methods.

By contrast, authors [10], who did not do any study on the type of learning styles in his research, viewed the use of technology as being able to accommodate students' learning styles. In other words, in the implementation of flipped classroom, students tend to adapt their learning styles to be more dominant.

The integration of learning styles in flipped classroom is actually not something new as it began to be emphasized since the flipped classroom method was introduced as early as 2000 by [11], known then by the term inverted classroom. [11] outlined an instructional strategy, namely, inverted classroom that

is capable of being in synchronized with students' learning styles. It started when [11] agreed with [19] who found that the consistency of pedagogy with learning styles is very important in ensuring that students learn more efficiently. Thus, educators need to diversify their teaching methods to accommodate the learning styles, although this seems difficult to happen in the existing traditional methods. This is because, diversifying the teaching methods according to students' learning styles is difficult due to time constraints. If educators want to fulfill the needs of students' learning styles, they need to extend the teaching time, and this is impossible to implement. Hence [11] set strategies to develop inverted classroom methods capable of implementing various students' learning styles without having to extend the existing teaching time or ignoring any topic in the syllabus. Therefore, [11] developed inverted classroom pedagogical methods, taking into considerations a few types of learning styles which have the potentials to be adapted as follows:

- 1) Grasha-Reichmann Learning Style
- 2) Myers-Briggs Type Indicator
- 3) Kolb

However, the authors believe that the students are able to absorb any type of learning style as long as it benefits them. The authors also feel that the study on flipped classroom which applies students' learning styles need to be implemented since the school level. This is supported by the findings from the research context of [12] that most of the University students do not participate actively when class activities such as debates and discussions take place. [12] also suggested some type of learning styles that can be adapted in the flipped classroom methods such as Myers-Briggs. The learning style of Myers-Briggs that uses Myers-Briggs Type Indicator is divided into four domains, namely:

- 1) Introvert-Extrovert
- 2) Sensing / intuitive
- 3) Thinking-Feeling
- 4) Perceiving-Judging

All the domains of the learning styles can be applied in the flipped classroom, which leads to an active and effective learning.

[13] meanwhile customized Holistic Learner Development (HLD), a model developed to be used to improve students' cognitive development as a result of combining a few learning styles such as Kolb and Vark. [14], [15] and [16] on the other hand, implemented the flipped classroom methods to a group of University students without applying any learning style. The authors see the opportunities for other researchers to explore the untouched area of study by making flipped classroom as a platform for educators to diversify their teaching methods to be synchronized with students' learning styles.

2.2 In Class Activities

In this section, meanwhile, the authors will comment on in-class activities undertaken by previous researchers. [8] and [11] focused on activities that involved group work as in-class activities. [10] on the other hand, used a combination of Inquiry based learning to ensure effective engagement among students. [12] took a very different approach by implementing opinion based learning activities. However [12] found that students remain passive when given activities which involve debates and discussions. Students also do not dare to argue against educators and they lack of ideas or opinions when requested. Open ended questions prepared by [13] aim to improve students' critical thinking. The research findings indicated that students could improve their thinking skills through problem solving activities provided. Almost the same results were found by researcher [8] and [11] in whose studies, team based learning was implemented in students' learning activities. Similarly, [14] and [15] considered that the use of activities in the flipped classroom is important to make learning more active, thus, undertaking cooperative problem based learning and project based learning activities.

3 DISCUSSION

In addition to fulfilling the requirement of the 21st century learning, flipped classroom is a method that is able to unearth students' talents. While a student is seen to be excellent academically at school, he may not be able to show desired characteristics such as voicing up pithy opinions and giving ideas at the tertiary higher education. He may not be active in group discussion sessions. Thus the implementation of the flipped classroom is able to guide the existing traditional class in the right direction in such a way that it becomes influential to students' learning. In the opinion of the authors,

the students should have their learning nurtured since their schooling days. School life is a platform for students to have their talents unearthed and is the time where flipped classroom methods should be introduced.

In the context of the flipped classroom itself, learning styles and student activities are elements which receive less attention. Hence, the authors are conducting a study which emphasizes on in-class activities, namely, project based learning, applied through the VAK students' learning styles. The significance of the authors' proposal was supported by The Intel Education Initiative report, which suggested the application of VAK learning styles through the use of technology [20]. While, the use of technology is suitable to be applied in project based learning. Thus, the authors would like to see the resulting impact produced in the flipped classroom method [21]. However, the data collection from this study is still on-going.

4 CONCLUSION

Students' learning styles and educators' teaching methods must be synchronized despite the various pedagogical methods being implemented. Applying students' learning styles can be done through the use of the proliferating technology being widely adopted in teaching and learning. Therefore, any available opportunity must be seized to fill the void in the research area to further enhance the effectiveness of the flipped classroom method.

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