RESEARCH PROPOSAL DEFENSE

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CONCEPTUALISATION OF DESIGN PROCESS ON ARCHITECTURE STUDENTS IN UNIVERSITI TEKNOLOGI MALAYSIA.
1. Background of the study

The conceptualisation in design learning is...

![Diagram showing the infiltration process on concept and knowledge](source: Emir & Duzgun (2008))

- Ideas/abstract knowledge/experience
- CONCEPTS
- Knowledge
- DESIGN STAGE

- Accessed for
- Applied in
- To support for
- Synthesis from
- Is based on
- Recursive/cyclical interactions

- Design problem
- Ideas & depictions
- SM critique
- Student’s acceptance

Infiltration Process on Concept and Knowledge

Source: Emir & Duzgun (2008)
Lawson's Theory on Episodic Memory on Design Knowledge
Adopted: Lawson (1997; 2004a; 2006)
2. Problem Statement

- In Malaysia, this conceptualisation study of the design process in design learning particularly is **minimal or almost none** due to the present curriculum based on functional and aesthetic learning method rather than explicate the implicit knowledge in the whole design process.

- This implicit knowledge no doubt is important in the design process, but yet **it remains implicit and left to be ignored** in its own world.

- As well, there is **no such explicit framework for the design educators** to clearly understand what is going on with their students and help the students with an explicit cautious, knowledge and structural.
## 2. Problem Statement (cont.)

<table>
<thead>
<tr>
<th>Major studies of design education</th>
<th>Concern and findings</th>
<th>Setting (Context)</th>
<th>The parameter being measured</th>
</tr>
</thead>
</table>
| (Hassanpour, Utaberta, Zaharin, & Abdullah, 2011; Hushin & Rahim, 2005; I. Rao & Arbi, 2006; S. Rao & Arbi, 2003), Zuhairuse & et al. (2007) | **Concern:** Curriculum assessment & learning outcomes on studio pedagogy, evaluation system & student’s performances | First year and second year architecture students in UKM (Malaysia)  
Final year architecture in UM (Malaysia) | • Student's design knowledge  
• Leadership  
• F.Y.E perceptions  
• Types in studio evaluation system  
• Design approach |
| (Higgins, Aitken-Rose, & Dixon, 2009; Kurt, 2011; Peel, 2006; Tucker & Reynolds, 2006)            | **Concern:** Design pedagogy of methods and implementation, and its effects on cooperative learning, perceptions & enhancement on environmental design learning | Postgraduates in planning & architecture program (N. Zealand)  
Research Assessment Exercise - RAE (UK)  
Third year architecture (Australia) | • Pedagogical approach  
• Threats & dilemma to studio learning  
• Teaching-research links  
• Teaching methods  
• Characteristics of study |
(Sachs, 1999; Uluoglu, 2000)                                                                 | **Concern:** Implicit knowledge of conceptual design thinking and evidence in design learning in the form of sketches, drawings, student’s strategies in reasoning as a comparison between the novice students and expert designers. | Graduate of industrial design and architecture programs (Israel)  
Architecture graduates (Turkey) | • Cognitive approach  
• Modelling skills  
• Modelling representation  
• Sketching and drawing activity  
• Types of sketches  
• Design reasoning  
• Visual analogy |
2. Local statistics on institutions offered architectural courses (cont.)

<table>
<thead>
<tr>
<th>Source</th>
<th>Universities</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 main universities</td>
<td>UTM, USM, IIUM, UiTM, UPM</td>
<td>Bachelor BSc. &amp; Dip in UTM &amp; UiTM</td>
</tr>
<tr>
<td>Other universities</td>
<td>UM, UKM, KUTPM,</td>
<td>Bachelor</td>
</tr>
<tr>
<td>Politeknik</td>
<td>Politeknik Ungku Omar, Port Dickson POLIMAS</td>
<td>Dip.</td>
</tr>
<tr>
<td>Kolej Kemahiran Tinggi MARA</td>
<td>KKTM Pasir Mas</td>
<td>Dip.</td>
</tr>
<tr>
<td>Kolej Komuniti (JPKK, KPTM)</td>
<td>There are 38 kolej komuniti, more than 20 offered Sijil in Archi.</td>
<td>Sijil Modular Kebangsaan (of 6 months training)</td>
</tr>
<tr>
<td>Private College</td>
<td>Taylor’s, LimKokWing, UCSI, UTAR</td>
<td>BSc. &amp; Dip.</td>
</tr>
</tbody>
</table>
3. Research Gap

- This study strikes to investigate the conceptualisation of design process among students that integrates the design concepts, skills, and knowledge been ignored and left to be gained implicitly through experience in the studio project.

- There is an empty gap on discussions of the cognitive thinking and how its development has helped students in their design process.
4. Research Aim

To explore the student's conceptualisation of the design process in studio project and its effects on student's formation of concepts in design activities.
## 5. Research Objectives – Research Questions

<table>
<thead>
<tr>
<th>Research Objective</th>
<th>Research Question</th>
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</table>
| 1. To explore the characters of conceptualisation activity that exists in the student's design process of a studio project | i. What are characters exist in the student's conceptual design process in studio project?  
ii. What are differences in the conceptual process between different academic pools in the studio? |
| 2. To track the student's conceptual through their actions and learning preferences in the design project | i. How students from different academic pools perceived conceptualisation in their design process?  
ii. Are the differences in academic background influence student's concepts and design activities in mode of learning in a studio project? |
| 3. To find out the framework of conceptual design that permits student's capability for design learning | i. What is the suitable framework in a design process that permits student's design learning in UTM? |
## 6. Significance of Study

<table>
<thead>
<tr>
<th>Significance</th>
<th>Implication</th>
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<tbody>
<tr>
<td>It adds that design knowledge, previous design experiences, a cyclic design process and critiques play an important role in conceptual design.</td>
<td>The cognitive content of design are noted as explicit learning without being ignored and left behind.</td>
</tr>
<tr>
<td>It accentuate the students' capabilities play important role in design learning, as it is a critical tool in subsequent the student's thinking and direction in their graphical representations.</td>
<td>It should not be neglected that students perceived different set by different ways of learning.</td>
</tr>
<tr>
<td>It would reveal the properties, attributes and key dimensions that support student's conceptualisation process in a design studio.</td>
<td>Add an explicit framework on how students conceptualise design in design projects.</td>
</tr>
<tr>
<td>An extension for the design educators in the teaching and learning in the disciplines of design learning.</td>
<td>It offers opportunity for the design educators for explicit framework and ways to assist the students to be effective in design learning process.</td>
</tr>
</tbody>
</table>
7. Scope of Study

ARCHITECTURAL

COGNITION

PSYCHOLOGICAL

COGNITIVE DESIGN
Perpetual, strategic, perception, contextual

Student’s knowledge and experience in design

Student's graphical representation of concepts, sketches and drawings

Precedent architectural projects

Critique and feedbacks

Stress, anxiety and student's acceptance
8. Theoretical Framework

- Focus on the work of Schon, Kolb and Lawson in experiential and reflective learning.
- Reflective theory: Integration of theory and practices with realisation of learners on a cyclic process and conscious application.
- Experiential theory: Direct participation in learning activities has utilises a trigger for knowledge transmission, driven by reflection.
- Kolb (1984) and Schon (1982) agreed through tacit knowledge and procedures, the action can reflected, extracted and improved.
9. Research Methodology

DATA COLLECTION

- Student's profile: Scientific description on student's learning styles and preferences based on their personality test.
- Student's assessments: Return marks of student's assessment on design works by the faculty expertises.
- Student's evidences: Content mapping and perception on perceived behavioural and environmental learning using student's graphical evidence, verbal and survey.

DATA ANALYSIS I
- Ratio analysis
- Rasch model analysis

DATA ANALYSIS II
- Content analysis
- Interpretative analysis

FINDINGS AND DISCUSSION
- Critical assessment and analysis on development of student's concepts
9. Research methodology (cont.)

<table>
<thead>
<tr>
<th>Method of Data Collection</th>
<th>Types of data collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Survey questionnaires</td>
<td>*scores on student’s capabilities</td>
</tr>
<tr>
<td></td>
<td>*perceptions on conceptualisation by students</td>
</tr>
<tr>
<td>2) Observation &amp; participatory</td>
<td>*student’s marks on studio assessments</td>
</tr>
<tr>
<td></td>
<td>*student’s sketches and drawing on design process</td>
</tr>
<tr>
<td></td>
<td>*student’s final design works</td>
</tr>
<tr>
<td>3) Video recording</td>
<td>*student’s crit &amp; comments</td>
</tr>
<tr>
<td>4) Interviews</td>
<td>*student’s perception on conceptualisation, design process, and crit comments</td>
</tr>
<tr>
<td></td>
<td>*justification by studio masters</td>
</tr>
</tbody>
</table>
10. Variables of the Study

STUDENT'S PERSONALITY TEST
- Class and individual profile
- Types of thinking order

STUDENT'S MARKS AND ASSESSMENT
- Dynamic
- Complexity
- Coordination
- Accessibility

STUDENT'S EVIDENCES ON DESIGN PROCESS
- Form
- Connectivity
- Characters
- Logical
- Visual

INDEPENDENT VARIABLES

ACTION
- Movement
- Spatial Pattern
- Strategic
- Operational
- Technical
- Textual
- Contextual

ASPECTS OF STUDENT'S COMPETENCE
- Clear and simple
- Systematic & structural
- Cyclic returning
- Integrated knowledge
- Consciousness
- Expressiveness

FRAMEWORK OF CONCEPTUALISATION OF DESIGN PROCESS FOR ARCHITECTURAL STUDENTS

DIRECTION FOR DESIGN LEARNING ENVIRONMENT
- Tacit knowledge on understanding and its procedures
- Guidelines for framework

DEPENDENT VARIABLES

EXPECTED OUTCOMES
11. Preliminary data collection and result

THREE POOLS

30 Direct Entry

8 Diploma

12 Repeaters

<table>
<thead>
<tr>
<th>38 students</th>
<th>Linguistic</th>
<th>Logical</th>
<th>Visual</th>
<th>Musical</th>
<th>Inter</th>
<th>Intra</th>
<th>Body</th>
<th>Natural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest mark ratio</td>
<td>0.87</td>
<td>0.87</td>
<td>0.93</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>0.87</td>
<td>0.87</td>
</tr>
<tr>
<td>Average ratio</td>
<td>0.62</td>
<td>0.65</td>
<td>0.74</td>
<td>0.62</td>
<td>0.67</td>
<td>0.68</td>
<td>0.70</td>
<td>0.65</td>
</tr>
<tr>
<td>Lowest mark ratio</td>
<td>0.33</td>
<td>0.33</td>
<td>0.53</td>
<td>0.33</td>
<td>0.47</td>
<td>0.47</td>
<td>0.47</td>
<td>0.27</td>
</tr>
<tr>
<td>No of students accounted averagely higher</td>
<td>21</td>
<td>22</td>
<td>17</td>
<td>16</td>
<td>23</td>
<td>16</td>
<td>23</td>
<td>19</td>
</tr>
<tr>
<td>No of students accounted below average</td>
<td>17</td>
<td>16</td>
<td>21</td>
<td>22</td>
<td>15</td>
<td>22</td>
<td>15</td>
<td>19</td>
</tr>
</tbody>
</table>
It was found that one student named Azri have all marks below the average line. While another student, Irma have good visualisation and more towards working alone mechanism.

Justification from the studio master:

**Azri:**
- He focuses on his own preference first in design and ignored feedbacks.
- He always turns out with a new design that caused his design work become impressive in form, yet lost track in serving the requirement for the targeted user.

**Irma:**
- A weak student and more towards self-working.
- Most of the time like to delay the work.
- It turns out her works involved a common design and always centred on the same concept with not much progress from the early to end of the semester.
- Her design also not resemble a strong identity.
For Logical skill, 16 students were below the average line, while for Visual skills, there were 21 students.

This understanding of Logical-Visual ability signifies hypotheses on conceptualisation of the students.

Hypothesis 1: The students who score higher at both logical and visual, tended to have good conceptualisation in design.

Hypothesis 1: The direct entry students tended to have good command of conceptualise compare to the diploma students.

Hypothesis 2: The diploma students tended to conceptualise in higher order thinking than the direct entry students.
Variation of Azri’s Sketches and Design Work

Design schematic Week 5
Design schematic Week 6
Design schematic Week 8

In Pre-Assessment (Week 12)
Final Assessment (Week 16)
Overall View On Students’ Conceptualisation Activities and Ideation

- **Previous own experience on d/task**
  - **I₀** (Preparation)
  - **I₁ (Site analysis)**
  - **I₂ (4 precedent of case studies)**

- **Add input from site analysis**
  - **I₁**
  - **I₂**
  - **I₃**

- **Own exploration**
  - **I₂**
  - **I₃**

- **SM critique**
  - **I₃**
  - **I₄**

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**JOE**

- **Site analysis**
  - **I₀**
  - **I₁**
  - **I₂**
  - **I₃**

- **Returning 1st I₁**
  - **I₁**
  - **I₂**

- **Returning 1st I₂**
  - **I₂**

- **Returning 1st I₃**

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**AZRI**

- **Site analysis**
  - **I₀ (Requirement by design brief)**
  - **I₁**
  - **I₂**

- **Returning 1st I₁**
  - **I₁**

- **Returning 1st I₂**
  - **I₂**

- **SM critique**
  - **I₃**
  - **I₄**

- **Returning 1st I₄**
At the end, the expected findings....

FRAMEWORK ON STUDENT’S CONCEPTUALISATION (the output)

Student’s Profile on Logical-Visual

Did these two match

Conceptualisation is triggered through the evidence on student’s sketches, marks & verbal

Did it contributed?

Student’s Evidences on Marks & Depictions

Did it clearly connected?
12. Limitations

1. Only to study the third year student's conceptual design process (Healy et al., 2001);
2. Not focusing on the expertise study, only focuses on the conceptual design in comparison between different academic pools within the third year students;
3. The different academic pools are focusing on the direct entry and diploma students;
4. To identify types of activity and characters that may exist during the conceptual design process.
13. Anticipated Findings

1. Reveal the **relationship between the student's skills and capabilities** with the student's concepts according to the different pools;

2. Reveal the **characters that exist and factors** that contribute for development of student’s concepts;

3. **Framework of conceptual design process** for the third year architecture students;

4. **Direct contacts with environmental design elements** that enhance student's skills in the design process including the exploration of their graphical sketches and manipulation from the feedbacks, as well as alignment of assessment with their learning preferences.
14. Research Milestone

**SEMESTER 1**
- Collection data 1 (Pilot Study)
- Collection data 2 (Student’s marks, assessment, graphics & survey)
- Seatuc8 2014 - submitted
- 1 Scopus (DONE)

**SEMESTER 2**
- Data analysis (SPSS & Rasch Model Analysis)
- Exploratory Analysis & Final write-up stage
- 1 Positioning Paper – done, not yet submitted
- Aim 1 Scopus Paper
- Aim 1 Journal Paper
- October 2014- SUBMISSION THESIS

**SEMESTER BREAK**
- 1 Positioning Paper