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# Student Engagement, Collaboration and Critical Thinking through a Board Game Module in an Architecture History Class

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## ABSTRACT

*A module of producing and playing board games was piloted to increase students' interest towards an architecture history class. Five classes adopted the module but only one class was studied for student engagements, the collaboration between peers and the presence of critical thinking. The investigation was collected through a questionnaire survey, in-depth interview and observation. The study concluded students were more active and engaging towards the class and outside of class. It was found the students to build and appreciate the collaborations developed between their classmates. The students were also observed to promote a creative synthesize of the subject on the product of the board game. It was concluded a board game module is able to trigger the interest of students towards a dense informative class.*

***Keywords:*** *student engagement, collaboration, critical thinking, history class, board game*



## 1 INTRODUCTION

An often-tenuous architectural education lies on the understanding of cultural context history. It is compulsory in any architecture syllabus outcome. However, considering the History of Architecture as one of the most unfavourable subjects for architecture students, a current knowledge-teaching was needed to make transversal changes. The traditional approach lacks the active learning, limits the promotion of collaboration and excitement. It is because they involved a lot of facts and memorization. Narrative methods in delivering the modules are efficient for stories of the past, however architectural history involves principles, philosophies, and mainly the need to highlight on visual content. Additionally, students even slept during class, even only after a few minutes of slide presentations. If not due to the dense of information, it may also be due to sleep deprivation of their core subject, 'Design' that required intensive hours of work completion, which learning in a teacher-oriented class will not help them.

To emphasize the main issue, the materials presented in a traditional slide-presentations are commonly a one-way communication. This leads to a passive participation and low interest in the class. The learning style lacks engagements with the subject, collaboration between peers, and presence of critical thinking. According to Mastor, Jin, & Cooper (2000), Malay students appeared to have low scores in openness due to their high scores of self-consciousness. It raises the reason for the students to be more passive as the studied sample are young Malay students. The traditional lecturer-orientation minimizes the students' character to be more active, thus it is not enough to deliver the high-dense informative subject efficiently to the local students.

An attempt to solve the above matter, a pilot module was developed by the researcher by breaking the tradition that was set by the previous History of Architecture courses. The project was a module containing three main steps, collecting information of the course; producing mechanics of a board game

and playing the board game itself. It was a combined work between different semesters of history classes.

However, the paper intents to outline the student's perceptions and interest towards only one particular class, the Modern Movement and Contemporary Architecture class which is in their second year (fourth semester). Thus, the objectives of the paper are:

- To identify the increment of engagements from the module;
- To recognize the collaboration that may benefited the students; and
- To ascertain if any critical thinking is present in the module.

# 2 LITERATURE REVIEW

The theory of determining the nature of human learning is by unfolding the type and process of learning, and its' conditions for effective learning (Bi & Yang, 2011). There is a variety of learning theories discussed in literature, however, one of the most extensive learning theories is Constructivism (Siemens, 2014). Constructivism is discussed as the theory on how people construct meaning and knowledge (Sjøberg, 2010) by which it is constructed from the learner and not imposed from the outside (Taber, 2006). A constructivist classroom is known by the percentage of the time spent on the student-centered activities and it should be conquered by a collaborative learning style (Dagar & Yadav, 2016). The application of constructivism pedagogy is discussed to encourage engagement, collaboration skills, and critical thinking (Li & Guo, 2015; Watts, 1997). It makes passive participants suitable in executing the theory. According to Dagar and Yadav (2016), the learning method that uses active construction of knowledge includes use of multimedia, Socratic dialogues, scaffolding, and role-playing games, simulations, storytelling and case studies, which in this case producing or playing a board game is not conclusive in the list. It is also reasoned that the constructivism's approach is different that it requires a qualitative in nature of assessment (Dagar & Yadav, 2016).

Student engagement in education denotes to the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning (Student engagement, 2014). In an effort of enhancing engagements in classrooms, games are commonly applied in class. Learning using board games had seen in literature as more of obtaining knowledge that involves memory, making it appropriate for intense information learning such as the usage of board games in anatomy studies and nursing concepts (i.e., Anyanwu, 2014; Yoon et al., 2014).

Collaboration between peers covers the act of coordinating, consulting, communicating and cooperating, which may potentially achieve more results than an individual work (Head, 2003). Gender diversity in group works is also commendable as it showed to enhance group processes (Bear & Woolley, 2011). Critical thinking is said to occur when students are analyzing, evaluating, interpreting, or synthesizing information and applying creative thought to form an argument, solve a problem, or reach a conclusion (Critical thinking, 2014).

# 3 METHOD

In this research, three methods were undertaken to study the students' engagement, collaboration and critical thinking. The methods were questionnaire survey, in- depth interview and observation.

The samples for the questionnaire survey and observation were 52 undergraduate second year architecture students (Semester 4). They produced two educational board games and played afterwards as a medium for a pilot experimental teaching module. The sample selected had an intermediate level of knowledge in architectural history. Thus, it was coincided to select the group for the investigation because of their experience being proportion in representing the overall population of the full programme. With the familiarity of the subject on the previous semester, this would enable them to recognize the differences between conventional teaching and learning with the new module.

The indicator for students' engagement in this course was through a questionnaire survey. It collected the students' actual enjoyment and experiences throughout the module. A five Likert scale was the tool in measuring the students' perceptions; with one (1) being strongly disagree, two (2) for disagree, three (3) for neutral, four (4) to agree and five (5) to strongly agree.

In addition, open-ended questions were also given to them as the platform to express their opinion on the module. It also allowed the gathering of perception on collaboration and critical thinking. Consequently, the questionnaire survey was able to evaluate all three objectives simultaneously. The formal survey was participated by the whole class, which was a total of 52 students.

An in-depth interview was also conducted in order to resolute and rationalise the results of both observation and questionnaire survey. It used purposive sampling as the method for the selection of samples. Two students of non-first timers of the course were selected because of their capacity to compare between two different teaching approaches (of the new and old).

The type of observation applied was a naturalistic observation. It was conducted throughout their 14-week classes which accumulate to their whole fourth semester. The observation evaluated the students' engagements to the subject, collaboration between peers and the presence of critical thinking in the module.

Briefly, the module is comprised of three main processes. First, the students were assigned in a group of five members and given each group a topic. Brainstorming process was carried out to produce fifteen sets of questions based on the selection of five buildings. The next phase is to produce the components of the board game. The process of producing the board game took three (3) classes or session to complete. The last phase of the module is where the students play the game. One of the changes have been made from the conventional method to the new module is the division of time spent for the lecture and the board game-workshop which is one hour for each approach. The original Monopoly (Hasbro) playing technique and guidelines became the basis for the process of making the board game with an innovation of adding questions from the course's content (Modern Movement and Contemporary Architecture)

# 4 FINDINGS

The total of samples for the questionnaire survey was 52 students with the female students being slightly higher (55% female, 45% male). Overall, the module had a very positive feedback on the class engagements, collaborations and critical thinking which was also parallel to the constructivism's theory.

## 4.1 Engagement towards Class

Results of the survey showed students' perceptions towards the interest of learning was very affirmative. It had a mean of 4.42, standing between agree and strongly agree (26 students to strongly agree, 24 students to agree and 2 students with a neutral feedback).

It had a similar response with the interview with the non-first timer of the course. They explained that the module is different from the traditional lecture they had before. According to the student, "It was much more fun". They have to move around and engage with their team mates in order to understand a topic. It is comparable with the finding of the learning modules in other fields that uses board games as an education medium (i.e., Anyanwu, 2014; Koster, 2005; Lee, Moreau, & Lochnan, 2015). The interview session also founded they were forced to read in order to win the game. Their motivation may also be derived from a behaviourism-theory standing point. The students were informed their grades of the course will be assessed based on their final game winnings. According to the theory of Behaviourism, people can be motivated by reinforcing through punishments and giving awards (Bryant, 2013; Watson, 2013). In order for them to get rewards and avoid punishment, they must

actively participate the game, do readings and have an understanding of all the topics in the course.

The observation on engagement of students was also perceived to be very positive. It was observed the groups that had finished their part in producing the board game showed interest in reading and memorizing the course's content. The observation concluded to achieve strong engagements and participations during the workshop as they have to produce the assignment right in class with their peers. It fits suitably with the student-centered setting similarly with the constructivism learning style (Dagar & Yadav, 2016). Students showed increment of interest of the facts and knowledge of the course not only during the required task in producing questions and answers. Students' engagement were also showed through their stressful and exciting behaviour during a test play. When corrected answers were given, the whole class cheered. The stressful part was because there was a time limit of the class. The indication of stress was shown when their chances to move were ceased for rolling a negative-numbered dice. It was their idea to reinvent a dice system that forces a player to move backwards. However, the dice system was changed due to its time consuming when played. Pressure was also seen during a player needed to answer a question, and quickly referred to his team mates to help out. It can be said it was a positive type of stress.

## 4.2 Collaboration between Peers

The open-ended question survey found 23 mentions on their satisfaction of teamwork develop during the module. It showed the module created a strong bond between peers.

In the interview it was explained that their session during the game lets each teammate exchange knowledge with their peers, which he said, "It was a more direct communication and faster information was received". Although the students are practically young adults, the situation is similar with Vygotsky's theory of a child's learning ability, whereby the learning process always occurred in a social context in co-operation with someone more skilful (McLeod, 2012).

From the observation during the preliminary stages, students were found to prefer to be in a larger group of four to five members rather than only with a partner. The allowance to form a bigger group, not only was to the accordance of their preference but it also created a more relaxing and created a less stressful ambiance in learning. This is similar with what the classrooms in the United States are applying, whereby the organization of the classes are oriented for a smaller group work rather than a massive lecture orientation (Jones & Araje, 2002). However, each group member was carefully selected to make sure the large group had less frolicking that was by having both genders in each group. It was purposely to get students to be more alert and engaged during the workshop with the idea putting them to an unfamiliar surroundings. From the observation, students involve actively throughout the process. It was similar with Takeda & Homberg's (2014) finding where a balanced gender in a group work displayed less social loafing and a more enhanced of collaboration. Figure 1 shows the collaborative of mixed genders in each group which was slightly uncommon for them. The observation throughout the semester concluded that the workshop actively created an environment that encouraged students to acquire knowledge through interaction and discussion among teammates.

**Figure 1:** Picture of Students' Discussions during the Workshop

## 4.3 Presence of Critical Thinking

The open-ended question from the survey allocated a bunch of mentions relating to somewhat presence of critical thinking. It was found 16 mentions about the board game approach allowing the students to absorb the subject on all topics simultaneously. It reflected the students to generate critical thinking because the students were exposed to analyse the link between each topic. There were also 9 mentions that specified the module to allow the students to express their creativity during their production and 1 mention to the improvement of their workmanship skills. It reflected the presence of critical thinking through their interpretation of solving a problem, which in this case is producing the game creatively.

However, from the observation, their ability in critical thinking can be best seen on the productions of the board games. They were made very unique, with non- traditional designs such as a hexagon form of the board, an unconventional dice with negative indicators and variety ideas of the shapes of cards. The 'money' in the game was also made according to the faces of architects in the history of architecture. It shows that the module was not focus only on the course content, but also the students' nature in being expressive as an architecture student (Figure 2 (a) & (b)). Figure 2 (b) shows the students playing the board game they produced.

**Figure 2(a):** Picture of Students Producing the Board Game (Left); and
**Figure 2(b):** Students Playing the Game (right).

# 5 CONCLUSION

It seems the module provided to the students created more interest towards the class and they were more responsive towards the subject that they took less attention. The module seemed to promote strong engagements, build good collaboration and challenge the thinking of the students. There are limitations to the experimental module such as constrain of time and having to conduct a large number of students. The research was also measured only from a particular level of student, which future studies can identify the experimental module on every other level of semesters.

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