INTRODUCING STUDIO ORIENTED LEARNING ENVIRONMENT (SOLE) IN UPM, SERDANG: ACCESSING STUDENT-CENTERED LEARNING (SCL) IN THE ARCHITECTURAL STUDIO
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Abstract
This article reports the initial results of the exploratory research related to student-centered learning (SCL) in final year Architecture studio education in Universiti Putra Malaysia (UPM). SCL is defined as an approach to empower students in their own learning. Although studies on the adaptability of this concept in education has increased, there are few studies conducted for the benefits of architectural education from studio design perspective. In this article, we define SCL as an approach to increase student autonomy in learning curve especially in making decisions related to design subjects using a summative and formative approach. The objective of this article is to experiment the SOLE model and how it can move forward. The SOLE (Studio Oriented Learning Environment) model encompasses lecturing, sharing and peer review that is inspired by self-regulated theory. However, several problems and difficulties were identified namely, a lack of tutor input and problems in discussion dynamic in addition to resistance to peer assessment. This article suggests a number of improvements for future recommendations. The study will benefit educators in the architectural field in contributing to helping students to build on unique background knowledge and at the same time let the students generate learning opportunities and reconstruct knowledge dynamically in an open-ended learning environment to implement SCL in the studio module.

Keywords
SOLE in architectural education; SCL; peer review; architectural pedagogy.

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INTRODUCTION

The design subject of an architectural school is the fundamental subject for every architectural student. It is a unique education process that differentiates architectural faculty from other professional faculties. A design subject, which often becomes the most crucial subject in the syllabus, can also be seen as using open-ended and iterative design ideas that involve multiple critiques and evaluations. The ideas and presentation are presented and evaluated through formal and informal discussion (Kuhn, 2001). Observation in architecture design studio can relate to the student centered learning characteristics such as project-based learning (Bell, 2010), case-based learning (Cifuentes, Mercer, Alvez, & Bettati, 2010) and complex learning process as described by Lee & Hannafin, (2016). Although various studies on the adaptability of this concept in education have increased, there are little to no studies conducted for the benefits of studio-oriented education from a design studio perspective.

In pursuit of a suitable studio oriented framework through SCL inspired technique, we are stimulated by the REAL model from two decades ago by Grabinger & Dunlap (1995). Although vintage, the concept is similar with regards to studio oriented concepts. The REAL strategy adopts high learning thinking activities that lead to producing an artefact. This is similar to studio oriented teaching strategies that promote ownership of the design work through design production. Furthermore, the SCL strategy must create support through enhancing attention, confidence, relevance and satisfaction (Keller, 2010). We evaluate previous research on SCL that relates to peer review and focuses on peer feedback in relation to assessment practices. We further delineate the assessment into 2 categories; formative and summative. Liu & Carless (2006), argue that peer provides better feedback in term of learning than peer assessment, however, a combination of both may be necessary and create a better understanding of the subject. We assert that the SOLE model will enhance a more complex cognitive architecture, the inclusion of monitoring and control within each phase of learning, and separation of task definition and goal setting into separate phases are all important contributions to the SCL literature for studio oriented studies.

In our studio, we propose an alternative design framework we called SOLE that encompasses lecturing, sharing and assessment that inspired by self-regulated theory by Butler & Winne, as cited by Greene & Azevedo (2007). The self-regulated theory assumes students to play an active role in the success of their own learning and understanding. By doing the self-regulation, the students are proven to develop more understanding and achieve objectivity while transferring the evaluation rubric into their own work (Liu & Carless, 2006). In this strategy, we engaged both peer feedback and peer assessment at the same time. Through this way, we ensure the feedback given by the peer to assess other students will be reviewed by the tutor to ensure the reliability of the marking scheme. Although the issues of the reliability of student grading are still conspicuous, the tutors often collate and double check the marks given to ensure the reliability of the marks.

There is some common misconception about how the students will perform when implementing SCL in their studies, especially that the students need to conduct their study independently without a facilitating lecturer (Hannafin, Hill, Land, & Lee, 2014). A canonical assumption is that prior knowledge and experience can influence the ability of one to mediate their own understanding (Hannafin et al., 2014). Nevertheless, students should be facilitated throughout the studio project, starting from the desk research, group discussion and presentation strategy. Furthermore, we present the SOLE model that we conducted in the
studio as teaching guidelines to support studio instructors and lecturers to create a self-taught learning environment in the studio subject. We conclude by discussing remaining questions and directions for future research.

METHODOLOGY

We propose SOLE in the design studio for final architecture students. We anticipated the focus group selection was based on the maturity of the final year students to make a decision and to participate in the peer assessment. We proposed a second assessment evaluated by the tutors on their seriousness in giving an assessment to their peers. An additional 10% was given on top of the studio marks for their participation in the peer feedback and assessment process. A useful way of motivating students to carry out peer feedback rigorously is described by Bloxham & West, (2007). The students were awarded certain merits and extra incentives for taking time on the assessment criteria and writing the feedback. Based on the report, the students were reported to acknowledge the incentives and motivated them to achieve them. The SOLE model started with a series of input lectures from the tutors (lecturing). Prior to the input lecture, the students are required to provide sufficient reading materials during the class. Next, the students were divided into several groups and design critiques were facilitated by the tutor assigned. In this step, books and reference materials will be shared and presented in the group (sharing). Next, the students participated in the peer feedback and peer assessment to evaluate their peer’s work and design in the given group (assessment). This is supported by the view from Lee & Hannafin, (2016) on the student’s role to assume more participation to cultivate their design ideas with support from the peers and tutors.

The assignment for each week was given earlier in the project brief and the students are given the freedom to systematically present their thoughts while discussing together with peers and to support constructivist learning approach (Lee & Hannafin, 2016). As suggested by Lee & Hannafin, (2016) through scaffolding technique, students do not passively receive and process information, rather, they enthusiastically build knowledge from primary and secondary sources. According to Liu & Carless, (2006) one of the benefits of peer involvement in assessment is that it engages students more actively with the familiarity of rubrics and the criteria to achieve the rubrics. We posit this strategy will ensure the
assessment process becomes more transparent and beneficial to the students. This strategy is seen as a process to include more participation from the students in the class and to develop the necessary skill for better evaluation (Liu & Carless, 2006). In our scenario, the tutor will act as a facilitator throughout the studio hours and evaluate performance, leadership and commitment from the student throughout the semester program. Facilitator roles are crucial in ensuring students are more focused in decision making rather than class participation alone (Kim & Davies, 2014). In order to achieve the objective of the SOLE, we ensure the students were well briefed about the objective of the project earlier on, a proper description of project brief was debated and this was to ensure the learning objectives were comprehensively captured in the studio design output as suggested by Kim & Davies (2014).

THE SOLE MODEL IN ARCHITECTURAL STUDIO

Inspired by self-determination theory by Deci & Ryan, (2008), REAL model by Grabinger & Dunlap, (1995) and OLSit framework by Lee & Hannafin, (2016), we present the SOLE model for the introduction of SCL in the architectural studio. We take into consideration the aspect of engagement, support, scaffolding and guidance and coordinate them to create a more holistic studio experience. Figure 1 represents the relationship between the individual tutorial (critique), external reading, input lectures and facilitator guidance along the semester observation. In the following, we describe activities that we conducted to support the SOLE model framework throughout the semester.

Lecturing

The first step is lecturing and learning process as one of the important element in SCL process. There are some common misconceptions about how the students will perform when implementing SCL in their studies, especially that the students need to conduct their study independently without a facilitating lecturer (Hannafin et al., 2014). A classical assumption is that prior knowledge and experience can influence the ability of one’s to mediate their own understanding (Hannafin et al., 2014). Nevertheless, students should be facilitated throughout the studio project, starting from the desk research, group discussion and presentation strategy. A distinct feature of studio design module is the complex technical requirements that are coupled with the quick propagation of potential design solutions. It is uncommon for architecture students to find any solutions by sitting within two or three hours in the class. The iterative process needs a lot of frequent critique and inputs on both the technical and the conceptual. Therefore, we conducted a series of lecture inputs throughout the semester according to the phases in the studio rubrics.

During the first 3 weeks, lectures were mainly focusing on the idea making and conceptual ideas based on precedent studies. Precedent helps to find existing solutions to design problems, however, students are to use the precedent as a reference rather than copying them. Prior to the lecture series, students were given the topic earlier on; it is up to the tutor assigned to choose the method of presentation to deliver the lecture. In the student’s portal, the tutors were given freedom to use media like video, YouTube or any other form of presentation to ensure the objective achieved. In the following week, the lectures will be focusing on the technical, structural and services aspects of the building. One special strength of the studio module is its ability to support multi-disciplinary and integrated education. The technical normally involves structurally sound building, passive and mechanical devices and sustainability elements in the building. The studio can act as a forum and debate to discuss certain issues such as fire fighting requirements and services that
relate to mechanical engineering. The studio master is responsible for making sure that the most important issues are covered during the course of the semester.

Figure 2: Lecturing and presentation session in the class (Source: Author).

Sharing
It is common for an architectural studio to conduct critique that can occur in both and informal ways. Previously, the culture of critique involves only one to one sessions, but with the introduction of SOLE, the students spend long hours working side by side on their projects in a group of 6 or 7 people. During the studio hour, they give each other frequent feedback and get both formal and informal feedback from the tutor. The students normally will literally pin up their drawings on the wall or show their progress using PowerPoint presentations and discuss their work with others. During the sharing session, each student was instructed to bring at least 3 new reading materials that relate to their work. They need to read beforehand and summarise the gist of the book or materials that they brought to the studio. The group met for 4 – 5 hours twice a week to discuss their progress and to share any materials they found online or in print. At this stage, the tutor will observe the student’s participation in the class and how they feedback to each other, and peer involvement that involves intellectual engagement and dialogues relating to rubrics and the requirements of the brief.

The conceptual idea of the sharing and peer feedback session is that it empowers the students to take a role in their own understanding of the subject matter. This step also helps the student to better self-assess and make a judgement about what has been learned as suggested by Liu & Carless, (2006). Based on the feedback in the student portal, this strategy really helps the students to actively get involved in articulating pressing matters related to the projects and tasks given. Therefore, peer feedback brings the potential for enhanced student's understanding in critical assessments, something beneficial to the students in the design course. Another advantage of the sharing and peer feedback is that students receive prompt and more feedback from peers than waiting for the tutor comments. Nevertheless, we encourage the students to verify their discussion with the tutor during the separate tutorial.
Assessment
Finally, the SOLE model describes peer assessment as one of the criteria that can be accepted as more matured students nowadays can be reasonably reliable assessors. However, there is an issue raised on the reliability of the grading and marking by the students. Nevertheless, we often collate and vet through the marks based on the marking schemes by the tutors. We observed that the peer assessment strategy helps to increase the productivities of the tutor’s time in the class. This might help for a studio proportion of more than 10 students per tutor. However, the time factor might cause discouragement as being mentioned by Topping (2005). Based on our experience, the time can be reduced significantly when the tutor takes seriously their own evaluation towards the students. Towards the end, the tutor will collate the given assessment and compare them with their own mark and observation for further verifications.

Rationale of SOLE for architecture studio module
The conceptual motivation for the SOLE model in architecture studio module is that it enables students to take an active role in the development of their own understanding on the
subject matter. This will also help to reduce the dependency of the studio-to-tutor ratio in the class due to increasing numbers of architectural students every year. The strategy of SOLE supports the idea of peer developed fairness in relation to the standard that they can use in their own work (Nicol, Thomson, & Breslin, 2014). However, we posit that the self-regulated learning should be assisted by individual critique and additional input outside the studio hours. To maintain the sanctity of the peer feedback and assessment during the studio hour, students were supported by additional input from a respective tutor for extra consultation on the design and technical aspect. There is much evidence that peer feedback enhances studio learning. As highlighted by students in the academic portal:

This approach (peer feedback and assessment) is the best way to expedite the learning process; previously I have no idea what my friends are doing (design). Now we can learn from each other better.

A further advantage of the SOLE model is that peer learning quicker, mutual understanding among students. Previously, students claimed that the tutor dictates their design creation process. With increasing online and secondary sources, peers no longer rely on the capacity of tutors for information, rather information can be obtained before class begins and verified with the tutor in the studio as part of the learning process. A further important reason for engaging SOLE is that design input is likely to be extended from single party to a more public (group). The discussion involves sharing ideas, materials, techniques and sources obtained from one reading to another. In this process, the complex understanding of the subject matters will be evolved and more discussion will be established. Another important element in the SOLE is to let the student be more expressive on their works. There are some cases where the students were having difficulties in establishing their conceptual ideas at the beginning. We asked the students to be more articulated and expressed what they understand and bring a lot of materials for reference. This is the part where the peers offer meaningful insights and share their materials publicly.

Figure 5: Tutor facilitating the group feedback’s session (Source: Author).
Rationale of peer feedback and assessment

Much literature provides justification on the reliability of peer assessment in course evaluation. For example, Liu & Carless, (2006) posit that students nowadays can become reliable evaluators. This is earlier supported by Falchikov & Goldfinch, (2000), whose experiment on 48 quantitative peer assessments proved that students can be as reliable assessors as their tutors. Nevertheless, it is argued that the issue of reliability of student judgement is still a prominent issue. Therefore, in the SOLE model, the tutor play roles to collate the marks evaluated by the students and further co-relate with the marks given by the assigned tutor. In this way, both summative and formative marks will be justified and vetted.

One piece of feedback reported in the online portal reveals some of the reasons why students like the SOLE model in their studio. One reason is about the freedom to express their understanding, thoughts and ideas freely. The student also requested less involvement from the tutors and to let the session be run by themselves. Tutors were viewed as a facilitator and only there to help the session when necessary. Nevertheless, we also received reluctance from the tutors:

*Peer review should only involve teaching and learning not about evaluating others.*

*Student is not qualified to assess others as they are not well equipped with the knowledge to do so.*

Nevertheless, the concept of peer assessment is getting more popular nowadays. As mentioned by Liu & Carless, (2006), students and tutor tend to be uncomfortable at first, but later get used to the style with time. Another aspect to look at is that it is past the time we change how we look at things, especially in the architectural education. This is further strengthened by the SOLE concept which will help the assessment become more reliable and develop student's ability to measure their own performance through evaluating others.

A WAY FORWARD

The SOLE model is still relatively new and in the phase of experimentation. Several problems and difficulties were identified, namely lacking tutor's input and problems in discussion dynamic alongside resistance to peer assessment. One way of handling the lack of tutor’s input is to provide a questionnaire at the beginning of the semester to be distributed to the students, to identify lecture input that they require for the benefits of the class. The topic selected must address student’s weaknesses on the subject matters. A useful way to conduct the lecture series more effectively is to also involve the students in the lecture process. Some of the innovations in the lecture series could involve a role play, a simulation act by the students, a debate or a forum organised by the tutors.

Next, the sharing and peer feedback session requires engagements from the students more active. We observed that some students have difficulties at the beginning to share their materials and to critique other works but eventually they get used to the process which helps them to develop conceptions of meaningful approach in their own learning. We also found out that with the SOLE approach, students are more aware of the standard required and reinforces the development of the self-assessment skills that are beneficial to lifelong learning and leadership skills.

Finally, a further strategy for assisting peer assessment is to start now or never. The advantage of peer assessment is that it gives the student time to process the brief and
rubrics effectively and enables them to learn better because it demands them to think disparagingly in a non-threatening atmosphere and friendly environments. This is true when some of the works previously have been conducted in a non-friendly environment that has caused the students to face embarrassment and even humiliation when their works been highly criticised by the jury or the tutors. Therefore, promoting a friendly environment for the peer feedback and assessment will be necessary to create a more conducive and innovative architectural studio environment in this new century.

CONCLUSION

This article has argued that although SCL has been implemented in the architectural studio, it still dismisses certain important features to make it more effective. We have introduced the SOLE model to enhance the teaching and learning in the studio based module. We have established a more systematic sharing and peer feedback process to alleviate some of the burdens faced by the lecturers in architectural education nowadays. To bring this further, the students finally can look from the meta-level on how the process of designing in the studio could be more collaborative, supporting the sharing idea and helping them to evaluate in order to understand the requirements of the brief better through understanding the rubrics themselves. However, the implementation of the SOLE model depends on the decision by the schools of architecture to do so. The SOLE model perhaps could give some alternative to the current way of teaching especially in the education that involves problem-solving and problem-oriented teaching methodology.

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REFERENCES


