# *Alternative Classroom Design's Relation to Student Satisfaction, Learning Engagement and Perceived Teaching Effectiveness in a Malaysian University Setting*

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**Abstract**
This study collected feedback from students and lecturers regarding "traditional" and "creative" (i.e. non-traditional) classroom designs. A sample of 140 current undergraduate and graduate students (male = 40, female = 100) and four lecturers (male = 1, female = 3) were surveyed regarding their learning experiences and impressions in "traditional" compared to "creative" classroom settings. Participants rated their level of satisfaction with the classroom setting, their level of learning engagement, and perception of teachers' competence in both types of classrooms. Students reported greater satisfaction with creative classrooms as well as greater learning engagement. Lecturers did not have a statistically clear preference between the two settings. Similarly, lecturers did not feel the classroom setting affected their teaching effectiveness while students reported greater teacher effectiveness within the creative classroom setting. It is suggested that more comfortable, student-centered classroom environments, while not necessarily preferred by teachers, may help students feel more involved and engaged in the learning process.

Keywords: Classroom Design, Learning Engagement, Malaysia, Counseling Education, Student Satisfaction

## Introduction

In improving the quality and effectiveness of the learning experience, it has been noted that the use of alternative classroom spaces has lagged somewhat behind the use of alternative pedagogical techniques (Miller, 2008; Scott-Webber et al., 2013). Specifically in Malaysia, the setting of this study, although the use of innovative, interactive teaching and learning techniques is actively encouraged, particularly at the tertiary level, most classroom settings remain relatively "old-fashioned" in design (Yesuiah, 2017). This is despite the fact that environmental psychologists have demonstrated that aesthetic and functional aspects of an environment can strongly influence behavior, mood, and cognition (Pressly & Heesacker, 2001; Scott-Webber, Abraham, & Marini, 2000). Meaning that if we want to change the learning process we should also consider changing the environment in which it takes place (Gifford, 2002).

Traditional classroom layouts are based on a strategy of standardization (Gardner, 2005). Learning in such environments is largely teacher-focused: The layouts are designed so that students can best focus on lessons being delivered by a teacher (Fisher, 2006). Desks and chairs are arranged in rows so that students face, and theoretically attend to, the teacher (Guardino & Fullerton, 2010; Kaya & Burgess, 2007). Such settings assume that class activities will be centered around the teacher's moral or physical authority and quality of learning is implied to relate to an assimilation of information rather than a transformation of thought processes (Betoret & Artiga, 2004). Again, this type of classroom setting remains the standard model in Malaysia (Yesuiah, 2017).This type of traditional classroom layout seems to be ill-served to many types of learning, often leaving students felling bored or constricted (Amedeo and Dyck, 2003), and simply focused on passing exams as opposed to learning (Zapatero, Maheshwari, & Chen, 2012). As most teachers know, students that are actively engaged tend to experience higher quality learning. So, it only makes sense to attempt to design a classroom setting that encourages interactive and cooperative learning processes (Betoret & Artiga, 2004; Gillies and Boyle, 2010). Refer to the setting for traditional classroom of Master of Counselling program (Figure 1 & Figure 2).

Figure 1: Traditional classroom design layout

Figure 2: Traditional classroom design layout

Many different ways of designing a classroom are possible. Open floor plans, group seating, and comfortable furniture are often suggested (Yang, Becerik-Gerber, & Mino, 2013). Cluster-type seating arrangements have been found to facilitate group discussions; U-shaped configurations have been observed to promote a sense of community and improve student–teacher interactions (Kaya & Burgess, 2007; Martin, 2002). Preferences however, will necessarily vary according to the teaching style (e.g., memory based, analytical or practical), as well as the subject material (Betoret & Artiga, 2004). Generally, however, flexibility in layout has been cited as a positive characteristic; allowing for both improved interactions between students and lecturers (White & Lorenzi, 2016), and more opportunity for student creativity (Imms & Byers, 2017; Jeffrey, 2006; Warner & Myers, 2010). Refer to the setting for creative classroom of Master of Counselling program (Figure 3 & Figure 4).

Figure 3: Creative classroom design layout

Figure 4: Creative classroom design layout

## Aim

This study surveyed students in a mid-size private Malaysian university regarding their experiences in both traditional and redesigned "creative" classrooms. Feedback from a small group of lecturers was also gathered.

## Research Questions

There were several questions this study was intended to pursue.

1) Are students (and teachers) more satisfied with non-traditional vs traditional classroom layouts?
2) Are students (and teachers) more engaged in the learning process in non-traditional vs traditional classroom environments?
3) Do students perceive greater teacher effectiveness in non-traditional vs traditional class environments?
4) What specific aspects of the classroom design are seen as most important?

## Participants

A total of 140 students currently enrolled in master's or bachelor's programs at a mid-size private university were surveyed. Three surveys were excluded because of incomplete responses resulting in a final sample of 140 students. Surveys were also completed by four lecturers. Of the 140 student participants, 40 were male and 100 were female. Average age was 25.8 (*SD*=3.1). Lecturers surveyed included one male and three females. Average age for lecturers was 36.2 (*SD*=7.5).

## Materials

### *Design Layouts*

A self-designed questionnaire was developed for each classroom setting. All participants provided demographic information including their gender, age and cohort year in their respective courses. Participants rated 8 items on a 5-point Likert scale (1 = very low level of satisfaction to 5 = very high level of satisfaction) regarding their satisfaction towards each of

eight classroom attributes (classroom space, colour, comfort of furniture, flexibility of furniture, acoustics, visibility, portability of technology, and interior ambience) in the traditional and creative classroom. The overall satisfaction scores will assist in determining which classroom environment had higher preference in utilization among students and lecturers.

Participants' responses to open-ended questions regarding the impact of classroom attributes towards their leaning engagement and teaching competency were also collected. This assisted in validating data collected and evaluating factors that potentially impacted the participants for each learning environment. The qualitative data analysis was classified according to each attribute, which will provide aid in future research improvement.

The questionnaire was adapted to versions relevant to the perspective of the participant group but consisted of similar questions. Below shows the following questionnaire variables students and lecturers were required to complete:

***Students' Questionnaire***

- The satisfaction towards classroom attributes
- The impact of classroom attributes towards students' learning engagement
- Students' perception of the impact of classroom attributes towards lecturers' teaching competence

The students' self-perception of learning engagement had measurements adapted from Yang et al.'s (2013) self-designed questionnaire and Rochester Assessment Package for Schools (RAPS; Klem & Connell, 2004) where questions where extracted and re-structured for the focus of this research. Eight items were rated on a 5-point Likert scale recording the impact of each classroom attribute towards students' learning engagement for each classroom setting. Overall impact of classroom attributes will determine which classroom setting had a significant impact towards students' learning engagement.

Questions from Monash University's (2017) Student Evaluation of Teaching and Units (SETU) and Evaluation of Teaching Performance (CEID; Moreno-Murcia, Torregrosa, & Pedreño, 2015) were also adapted for the questionnaire. Students were required to rate nine items on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) on their perception towards their lecturers' teaching competency for each classroom setting.

***Lecturers' Questionnaire***

- The satisfaction towards classroom attributes
- The impact of classroom attributes towards lecturers' teaching competence

In the lecturers' version of the questionnaire, measurements were adapted from the Student Evaluation of Teaching Effectiveness (SET; Mortelmans & Spooren, 2009) scales to distinguish the attributes that significantly impacted lecturers' self-perception of teaching competency. Only questions relevant to the focus of this research were extracted. Eight items were rated on a 5-point Likert scale recording the impact of each classroom attribute towards lecturers' teaching competency for each classroom setting. Overall impact of classroom attributes will determine which classroom setting had a significant impact towards' lecturers' teaching competency.

## Procedure

The study was carried out after obtaining the low-risk ethics application approval from Monash University Human Research Ethics Committee (MUHREC); and approval from Monash Campus Research and Development. Students and lecturers from the university were invited to participate via announcement in lectures a week before research was carried out. An explanatory statement was distributed to outline details of the study such as the purpose of study, benefits and risks of the study accompanied with contacts for emotional support for those adversely affected, confidentiality of information, and storage of data.

The students chosen were in courses that engaged in activities such as group discussion, presentation, role-play activities and brainstorm activities for lots of sessions of the units. At the end of the following week, questionnaires were distributed to 81 participants in the traditional classroom and 59 participants in the creative classroom. Participants answered questions related to demographics, satisfaction with physical attributes of the classroom, their perception of their own learning engagement and their perception of the competency of the teacher. These concepts were explained to students before they began the questionnaire and they were allowed the opportunity to ask questions if they were unclear on any of the constructs being measured. Upon providing informed consent, participants completed the questionnaire.

For student participants, a hard copy of the questionnaire was distributed during the last 15 minutes of their lectures and was returned at the end of the lecture. Lecturer participants were given an online questionnaire link to be completed and submitted at the end of their teaching day. Lecturers were evaluated based on the criteria: preparedness, enthusiasm, clarity of explanation, useful feedback and opportunity for interaction.

The following week classroom assignments were reversed so that the class from the traditional classroom moved to the creative classroom and vice versa. Afterwards completed the same questionnaire regarding their impressions.

Classroom activities in both classroom settings were also observed by experimenters. Differences in activities and behaviors between classroom settings were noted. Lecturer participants were also asked for their personal opinions regarding the differences between classroom settings. Participants were given a debriefing upon completing the second set of questionnaires.

## Overall Students' Satisfaction of Classroom Attributes

An overall satisfaction of classroom attributes was derived from the sum of satisfaction scores for each classroom setting. Paired-samples t-test results showed a mean difference of 5.38, 95% CI [4.14, 6.62] between the overall satisfaction of creative classroom attributes ($M$ = 31.11, $SD$ = 4.75) and overall satisfaction of traditional classroom attributes ($M$ = 25.74, $SD$ = 5.50). This produced statistically significant results, $t(140) = 8.58$, $p < .001$, two-tailed, $d = 1.05$, indicating that students were generally more satisfied with the creative classroom setting.

## Overall Impact of Attributes on Learning Engagement

An overall impact of classroom type was obtained by summing learning engagement scores for each classroom setting. Results showed a mean difference of 2.57, 95% CI [1.25, 3.89] between the overall impact of creative classroom attributes ($M$ = 29.87, $SD$ = 6.02) and overall impact of traditional classroom attributes ($M$ = 27.30, $SD$ = 5.76). There was a statistically significant difference in the overall impact of learning engagement between classroom settings; $t(140) = 3.84$, $p < .001$, two-tailed, $d = 1.17$. Thus, students perceived themselves being more engaged in their lessons in the creative classroom.

## Students' Perception Towards Lecturers' Teaching Competency

Students' perception of their lecturer's teaching competency was also measured for both classroom settings. Paired-samples t-test were conducted and statistically significant results were obtained; $t(140) = 5.66$, $p < .001$ two-tailed, $d = .59$. The creative classroom ($M$ = 36.36, $SD$ = 5.33) had a higher mean of scores compared to the traditional classroom ($M$ = 32.84, $SD$ = 6.55), mean difference of 3.53, 95% CI [2.30, 4.76]. Students perceived their lecturers as having higher teaching competency in the creative classroom.

## Overall Lecturers' Satisfaction of Classroom Attributes

The difference between the overall satisfaction with classroom attributes between the two classroom settings was calculated using Wilcoxon signed-rank test. Results indicated that all lecturers generally were more satisfied with the creative classroom (*Sum of Ranks* = 10.00). However, this was not statistically significant as $T = .00$, $p = .068$, two-tailed, $r = -.91$.

## Overall Impact of Classroom Attributes on Teaching Competency

Wilcoxon signed-rank test showed that three lecturers felt a positive impact on their teaching competency from the overall creative classroom attributes classroom (*Sum of Ranks* = 6.00). Only one lecturer felt indifferent towards both classroom settings. However, results obtained were not statistically significant, $T = .00$, $p = .109$, two-tailed, $r = -.93$, large effect size.

## Discussion

This study explored preferences in classroom design among Malaysian university students and lecturers, as well as the impact of eight classroom attributes on perceived learning engagement and teaching competency between two different classroom settings. Three hypotheses were examined regarding— satisfaction with classroom attributes; impact of classroom attributes on learning engagement; and, impact of classroom attributes on teaching competency. Significant preferences in all three areas were found for the creative classroom setting among students but not among lecturers.

A breakdown analysis found six out of the eight classroom attributes measured here had a significant relation to student satisfaction. First the size and layout of the creative space provided was preferred by students. As predicted by Scott –Webber et. al. (2000), students were satisfied with the critical distance between lecturer and student while being able to maintain a personal learning space among themselves.

Another important factor was the comfort of furniture. Students could naturally assume a variety of positions on the sofas to get comfortable throughout long hours of learning. Thus, students felt generally more satisfied in the creative classroom as the furniture made sitting through classes more bearable.

The interior ambience of the creative classroom was also preferred by students. Students were impressed with the amenities in the creative classroom. They were given a relaxed learning space that provided features designed to enhanced their learning compared to the plain, more spartan, interior of the traditional classroom.

In regards with the flexibility of the furniture, students appreciated furniture that was easily moveable and could be repositioned when required to face different directions for lectures or demonstrations. This supported Pressly and Heesacker (2001) who stated classroom users would appreciate a sense of control over seating arrangement and furniture to aid their learning.

Besides that, the portability of technology demonstrated significant results. As technology was conveniently relocated when required, students were contented with its function in aiding their learning. However, not too surprisingly, additional power outlets were recommended so they would not need to "compete" for recharging ports.

Students generally reported the creative classroom a "good colour combination". Significant results were shown for satisfaction with the colours of the creative compared to the traditional classroom. Tofle, Schwartz, Yoon, and Max-Royale (2004) reasoned that the same colours could affect people differently due to their culturally learned associations, and physiological and psychological makeup. Future designs could implement Thompson's (2003) suggestion in researching appropriate colours for the age and culture of the student population served.

There were two classroom attributes that did not show significant differences in satisfaction between the two classroom settings. There were audio distractions constantly present in the creative classroom. It was noted that it is important to use door dampers for the classroom doors and to avoid furniture with squeaky polyurethane surfaces. Other comments were made regarding less than optimal visibility at times in the creative classroom. Although the deeper and wider creative classroom had appropriate arrangement of rows of furniture as suggested by (Lei, 2010), the movability of furniture and the size of the screen on which learning material is projected should be noted as factors that affect visibility.

These two results contradicted past research on some level (Gardner, 2005; Hall & Wilczynski, 2005; Hill & Epps, 2010; Lei, 2010; Warner & Myers, 2010; Yang et al., 2013). Likely, however, these are due to idiosyncrasies in the design of this particular classroom setting as opposed to generalizable findings.

As predicted, students expressed higher overall satisfaction with the creative classroom. These results were in accord with much previous research (e.g. Hill & Epps, 2010; White & Lorenzi, 2016), that has found that features such as those in our creative classroom setting improve student satisfaction and performance.

Apart from considering the students' perspective, this study also looked at lecturers' experiences. Lecturers mostly expressed positive views about the creative classroom

compared to the traditional classroom. For instance, remarks on lighting in the creative classroom aligned with past research by White and Lorenzi (2016) expressing that openness and bright décors were preferable. Lecturers appreciated the relative freedom of movement and flexibility of arrangement afforded by the creative classroom, similar to findings from Jankowska and Atlay (2008).

There were, however, conflicting remarks among the lecturers on certain classroom attributes. For example, the multiple colours in the creative classroom had a positive influence on emotions for some (Pearson and Wilson, 2012). But, half of the lecturers were indifferent towards the colours, supporting Tofle et al.'s (2004) contention that the same colours could impact others differently.

Although qualitative data collected from lecturers was generally favorable towards the creative classroom, due to the small sample size, quantitative results did not indicate significant differences. Thus in quantitative terms these results did not replicate previous studies (Amedeo & Dyck, 2003; Jankowska & Atlay, 2008; Scott-Webber et al., 2000; White & Lorenzi, 2016). Hence, the first hypothesis was not fully supported among lecturers.

To investigate the second hypothesis regarding learning engagement among students, results were broken down by attribute. Total mean scores for most attributes of the creative classroom showed statistically higher perceived learning engagement among students, supporting findings from previous studies. On the other hand, students did not see several classroom attributes as contributing to their learning engagement. In spite of expressing satisfaction with the comfort and flexibility of the creative classroom furniture, the students did not perceive this to necessarily support their learning engagement. Some students reported that the furniture "felt overly comfortable" making it "tough to concentrate" and they were prone to "feeling sleepy". Acoustics and visibility in this setting were also deemed not as sub-optimal for learning engagement. Insufficient power sources also hindered the portability of technology, which in turn limited opportunities for students to engage. These differences from previous research could be cultural (e.g. Campbell & Li, 2008) or could be due to idiosyncrasies in the design of this particular creative classroom setting.

Nonetheless, overall analysis demonstrated that the creative classroom attributes had significantly higher impact on students' learning engagement. Students perceived themselves as more attentive, interested, and invested in learning. This in turn positively affected their academic performance in the creative classroom. Overall results in regard to student learning engagement were as predicted in previous research (Doppelt & Schunn, 2008; Guardino & Fullerton, 2010; Jankowska & Atlay, 2008; Scott-Webber et al., 2013). Thus, the second hypothesis was accepted.

Finally, the third hypothesis examined the relationship of classroom attributes with lecturers' feelings of their own competency. Results here showed that there was no significant difference in feelings of teaching competency between the classrooms. This contradicted findings from past research (Cornell, 2002; Imms & Byers, 2017; Martin, 2002). Therefore, the third hypothesis was rejected. Aside from the sample size, one plausible reason for this could be that lecturers were not utilizing the full potential of the facilities provided in the creative classroom to enhance their teaching. For instance, lecturers were satisfied with the furniture but disapproved of the cluster layout arrangement. However, it was observed that lecturers rarely rearranged the layout for their lecture sessions. Rearrangements were mostly carried out during interactive group work and role-play activities by the students. It almost

assuredly would require some adjustment period for lecturers to become fully accustomed to the features of the creative classroom and to adjust their teaching style and techniques to make the best use of it.

In this regard Gillies and Boyle (2010) remarked that because lecturers act as guides in learning, they must be aware of the effects of classroom layouts. Optimal physical organization of the classroom can depend upon the learning activity, mode of teaching approach, patterns of communication and behavior towards students. Lecturers need to abandon the attachment to past practices that pervades many teaching approaches and be creative themselves in how they approach the layout of classrooms as well as different teaching approaches (Imms & Byers, 2017; Wild, 2011).

In contrast, students perceived their lecturers to be more competent in creative classrooms. Past research has indicated that perceived communication is a key factor towards students' perception of teaching competency (Sweeney, Morrison, Jarratt, & Heffernan, 2009). Open communication between students and lecturers, and satisfaction towards instructor and contents of the course were important in determining students' perception of lecturers' teaching effectiveness. This supported Barat, Rajamma, Zolfagharian, and Ganesh (2009), and Parayitam, Desai, and Phelps (2007) verifying the existence of a positive relationship between perceived communications, overall evaluation, and perceived competence gained through the course.

## Conclusion

The current pilot study showed that Malaysian students and lecturers generally liked and appreciated creative classroom features. Although limitations of this research were substantial, the results suggest that attention to learning spaces could improve the educational experience in Malaysia. The findings should provide encouragement to Malaysian educational institutions towards investing in classroom layouts that support active learning and innovative teaching (e.g. Scott-Webber et al., 2013). These findings also suggest specific aspects of classroom layout that may be of greatest importance to Malaysian students. Generally, openness, good lighting, flexibility, comfort, and tech-friendliness were highly appreciated by both teachers and students. This suggests that much about the learning experience can be improved through creatively altering the learning environment. These findings also suggest though that it is not enough just to take old pedagogical techniques and put them in a new environment. To really improve the learning experience teachers need to reorient their teaching strategies towards student engagement. Making classrooms more student-centered also means making learning less teacher-centered which may be an adjustment that is difficult for many to make.

## Author Contribution Statement

TCL provided the materials of the present study in Monash University Malaysia and supervised the overall process of the research. CY completed the literature review, formulated hypotheses, short-listed appropriate measurements, recruited participants, analyzed the data, and prepared the final manuscript.

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