

THE EFFECT OF THE PHYSICAL LEARNING ENVIRONMENT ON STUDENTS' HEALTH, ENJOYMENT AND LEARNING

¹Che Nidzam Che Ahmad, ²Nurul Jannah Amirul

^{1,2}Fakulti Sains dan Matematik,
Universiti Pendidikan Sultan Idris

Abstract

This study was conducted to analyze the suitability of the physical classroom learning environment and its effect on students' health, enjoyment and learning. The participants of this study were 400 form four science students from six secondary schools in Johor, Malaysia. Students' perception on physical aspects and its effect were measured using Physical Aspects Classroom Environment Inventory (PACE). The PACE consists of nine constructs. Six constructs which were furniture, facilities, space, lighting, indoor air quality and colour were used to measure the suitability of the physical classroom environment. While three constructs which were health, enjoyment, and learning were used to measure the effects of physical environment on students. The findings revealed that students perceived the suitability of physical environment is at high level for furniture, facilities, and lighting aspects, while moderate level for indoor air quality, space, and colour aspects. Results also showed that students perceived the physical environment have moderate effect on student's health, enjoyment, and learning. Further analysis indicated that the physical environment have significant impact on students' health, enjoyment and learning. These results provide valuable feedback to institutions and to educators in setting their learning environment

Keywords *Physical environment, classroom, student learning, enjoyment.*

Abstrak

Kajian ini dijalankan untuk menganalisis kesesuaian persekitaran fizikal pembelajaran bilik darjah dan kesannya terhadap kesihatan, keseronokan dan pembelajaran pelajar. Responden kajian merupakan 400 orang pelajar tingkatan empat sains dari enam buah sekolah menengah di Johor, Malaysia. Persepsi pelajar terhadap aspek fizikal dan kesannya diukur menggunakan inventori Persekitaran Fizikal Bilik Darjah Inventory (PACE). Instrumen PACE ini terdiri daripada sembilan konstruk. Enam konstruk yang ialah perabot, kemudahan, ruang, lampu, kualiti udara dalaman dan warna digunakan untuk mengukur kesesuaian persekitaran bilik darjah fizikal. Manakala tiga konstruk yang lagi iaitu kesihatan, keseronokan, dan pembelajaran telah digunakan untuk mengukur kesan persekitaran fizikal ke atas pelajar. Dapatan kajian menunjukkan bahawa pelajar berpendapat kesesuaian persekitaran fizikal bilik darjah adalah pada tahap yang tinggi untuk aspek perabot, kemudahan, dan aspek pencahayaan, manakala tahap sederhana bagi kualiti udara dalaman, ruang, dan warna. Keputusan juga

menunjukkan bahawa pelajar berpendapat persekitaran fizikal mempunyai kesan sederhana ke atas kesihatan, keseronokan, dan pembelajaran pelajar. Analisis lanjut menunjukkan bahawa persekitaran fizikal mempunyai kesan yang besar ke atas pelajar kesihatan, keseronokan dan pembelajaran. Keputusan ini memberikan maklum balas berguna kepada institusi dan pendidik dalam menyediakan persekitaran pembelajaran mereka.

Kata kunci *Persekitaran fizikal, bilik darjah, pembelajaran pelajar, keseronokan.*

INTRODUCTION

Learning environment is the space allocated for learning and teaching and it is an important aspect that needs to be addressed to ensure the effectiveness and to improve learning outcomes. Quality learning environment may promote intellectual activities, interaction, generation of ideas, friendship, cooperation and encourage learning, growth and personal development of students. In the learning environment, there are various aspects that interact and affect the students. Many studies conducted shows the learning environment can affect learning outcomes and student development (Serris & Miller, 2011; Evans, 2006). The study also revealed that there is a relationship between the learning environment with student in terms of their achievement, satisfaction, comfort, health and enjoyment (Higgins, Hall, Wall, Woolner, and McCaughey, 2005; Che Nidzam Che Ahmad, Kamisah Osman, & Lilia Halim, 2010). In addition, the learning environment may also affect students' behavior and their social interaction (Sanoff, 2000). Thus, the classroom learning environment should be well designed and carefully planned to enable students to learn comfortably, collect learning information actively, gain appropriate experiences, assess their own learning and responds to their personal experiences in a variety of contexts.

LITERATURE REVIEW

The learning environment has to be filled with stimulus and provide opportunities for students to explore and gain useful experiences. According to Maxwell (2007), the design of learning environments need to promote effective learning and create opportunities to learn. In the school, most of the learning occurs in the classroom. In this environment, there are students with specific goals, needs and different abilities but have to share the same resources and materials in completing the tasks, and moving around the same space. Students will spend most of their time in the classroom and this environment can directly affect students, therefore the quality of the classroom learning environment is very important.

The quality of the classroom learning environment depends on various aspects. One of the aspect is the physical aspect in the classroom. Physical aspects of the classroom may influence the students' behavior and also affect the relationship between teachers and peers. According Arzi (2003) active learning in the classroom has a significant relationship with the physical facilities provided. Wong and Fraser (1996) also noted, the learning environment is a key determinant

in student learning. Student learning outcomes can be improved by creating an environment that is appropriate to the needs of teachers and students as well as in parallel with on going learning activities. The well design classroom environment may offer opportunities for students to explore, learning through play, interact with peers, enhance self-confidence and improve social skills. According to Curtis and Carter (2005), learning space need to be flexible with furniture and mobile devices, offers a place to play at different angles and levels, and designing the space to relax and space to do activities actively. In addition, the learning environment should be designed to improve teaching effectiveness and provide a sense of belonging, safety and comfort, as well as help the students to establish their own identity by encouraging exploration and learning through play (Moore & Sugiyama, 2007; Weinstein, 1987).

Physical aspects in the classroom should support various learning teaching strategies. The table and chair used must suitable with the students to increase learning retention and concentration throughout the learning process. The lighting must be adapted with learning activities and the space available. According to Olds (1987), there should be flexibility in the use of natural and artificial light which may fulfill various requirements of tasks. Apart from that, the colors in classroom also need to be appropriate so it can create a sense of belonging (Read 2007), convey information (Dudek, 2000), as a guidance for spatial orientation (Acredolo, 1979) and promote cooperative behavior (Read et al., 1999). This is because previous studies (Moore & Sugiyama, 2007; Read, 2007; Weinstein, 1987), showed, physical aspects such as space, light, color and material has been seen by teachers and parents as contributors to student enjoyment in learning. Appropriate physical facilities will stimulate intellectual activity, improving social relationships, promote student learning and development as well as limiting the negative behavior among students (Arzi, 2003). This, in turn will make the teaching and learning more effective and enjoyable (Che Nidzam et al., 2010). As a result, knowledge and understanding may be increased. Thus, it is clear that the physical aspect of learning environment should be planned well because it reflects the ideas, values, behavior and culture that are expected in the room (Sanoff et al., 2010).

PROBLEM STATEMENT

Concentration and students' focus throughout the learning in the classroom is an important aspects that needs an attention. Students focus on learning would be better if the learning environment is in good condition and comfortable. This is because previous studies found that the physical aspects of learning environment can affect the psychology and social behavior of students (Moos, 1979) and thus have a major impact on student learning (Chism, 2006; Strange & Banning, 2001). In addition, the study also found that students apparently still not satisfied with the existing learning environment (Che Nidzam et al., 2010; Marzita et al., 2012; Mohd Hairiy et al., 2012). Despite the important of physical aspect on students' learning, there are not many studies have been carried out to correlate the physical

design with practices in classroom (Veal & Jackson, 2005; Ahmad Fauzi, 2005; Lilia, 2009). Therefore, this study aimed to identify the effect of the physical aspects on learning, health and enjoyment of student in the classroom.

Research objective:

1. Identify the suitability of the physical environment of classrooms from students' perspective.
2. Identifying the effect of the physical environment on health, enjoyment and student learning.
2. Identify whether there is a relationship between the physical classroom environment with students' health, enjoyment and learning.

METODOLOGY

This study uses a quantitative research design. A total of 400 Form Four students from six secondary schools in Johor were selected randomly as respondent. Students' perception on physical aspects and its effect were measured using Physical Aspects Classroom Environment Inventory (PACE). The PACE consists of nine constructs. Six constructs which were furniture, facilities, space, lighting, indoor air quality and colour were used to measure the suitability of the physical classroom environment. While three constructs which were health, enjoyment, and learning were used to measure the effects of physical environment on students. This instruments have been validated by experts in the field of education and the reliability was determined using Cronbach's alpha index. Cronbach alpha values obtained this instruments is between 0.83 - 0.98. According to the views Mohd Majid (2005) and Hair et al., (2006, 2010), this value is good and acceptable.

RESULT AND DISCUSSION

a. The suitability of physical aspect classroom environment

Table 1 shows the mean and standard deviation for each aspect of the physical environment in the classroom studied.

Table 1 The mean value and standard deviation for each aspect of physical environment

Construct	Mean	Standard deviation	Intpretation
Furniture	3.91	0.88	High
Facilities	4.16	0.98	High
Space	3.66	0.95	Moderate
Lighting	4.05	0.83	High
Indoor air quality	3.32	0.92	Moderate
Colour	3.41	0.92	Moderate

Based on Table 1, the facilities aspects (mean = 4.16, SD = 0.98) has a high level of suitability followed by the lighting aspect (mean = 4.05, SD = 0.83), the furniture aspect (mean = 3.91, SD = 0.88), the space aspect (mean = 3.66, sp = 0.95), the color aspect (mean = 3.41, SD = 0.92) and the last is the indoor air quality aspect (mean = 3.32, SD = 0.92). These findings showed that the students perceived the suitability of furniture, lighting and facilities in the classroom were at high level. According to Nurul Yakima, Maimunah Sapri, and Mohd Shahril (2011) facilities' quality provided are linked with customer satisfaction. In fact, Nurul Yakima et al., (2011) also explained that the facilities provided are considered good if it meets the requirements of customers. Therefore, it can be stated that the students are satisfied with the furniture, facilities and existing lighting in classrooms in secondary schools. However, the results obtained are inconsistent with the previous findings (Higgins, Hall, Wall, Woolner, and McCaughey, 2005; Che Nidzam Che Ahmad, 2011; Kamisah Osman, Che Nidzam Che Ahmad, & Lilia Halim, 2011) that show dissatisfaction on various physical aspects in the classroom. This is likely due to the pupils who participated in this study feel comfortable with existing physical aspects. This scenario might be because they are less exposed to the new furniture design and variety of new classroom facilities available now a day.

The result also showed that students believe the indoor air quality, space and color in the classroom were at moderate level. The result indicated that the students still not satisfy with these aspects. This result might be because of the number of students in a class were exceed than 30 students. Too many students in the class will cause learning space becomes congested, increase room temperature, decreased quality of air circulation and finally affect student achievement (Duncanson, Volpe, and Achilles, 2009; Tanner, 2009). Therefore, the quality of the physical aspects should be improved so that students are able to undergo learning process with confort. According to Lippman (2010), researchers have debates whether whether pupils should adapt to the learning environment or the learning environment should be adapted to the students.

b. Effects of the physical classroom learning environments on students health, enjoyment and learning

Table 2 presents the mean and standard deviation of the physical aspects on students' health, enjoyment and learning. Students preceived the physical aspect in the classroom positively affect student learning (mean = 3.53, SD = 0.93), enjoyment aspects (mean = 3.21, sp = 1.03) and health aspects (mean = 2.79, sp = 1.08).

Table 2 Mean and standard deviation of the physical aspects on students' health, enjoyment and learning

Construct	Mean	Standard deviation	Interpretation
Health	2.79	1.08	Positif
Enjoyment	3.21	1.03	Positif
Learning	3.53	0.93	Positif

Overall, the results show that students perceived the physical environment affects health, enjoyment, and learning. The findings paralell with previous studies which also clearly demonstrate that the physical environment have an impact on students (Maker & Nielson, 1995; Callahan, 2004; Higgins, Hall, Wall, Woolner, and McCaughey, 2005; Tanner, 2009; Bektas-Centikaya & Oruc, 2011; Liang, Hsu, Huang, & Chen, 2012). Thus, improvements must be made to the physical aspects of classroom environment to help improve students' health, enjoyment and learning. This is because conducive classroom environment will increase students' retention and motivation to learn. According to Sanaz Ahmadpoor Samani (2011), if a student is able to maintain their motivation in the classroom, they will be more successful in their academic acheivement. Callahan (2004) also states that the physical environment plays an important role in the learning process. In addition, Nurul Yakima, Maimunah Sapri, and Mohd Shahril (2011) state that the physical environment of the classroom can affect students' attendance, learning and achievement in school. In fact, Tanner (2009) found the physical environment can affect student's afective, behavioral and cognitive abilities.

c. Relationship between the physical aspect classroom environment with Health, enjoyment and learning

Pearson correlation analysis was used to assess the relationships between the physical environment with health, enjoyment and learning. Table 3 presents the results of Pearson correlation analysis.

Table 3 Relationships between the physical environment with health, enjoyment and learning

Construct	<i>r value</i>	Significant level <i>p</i>
Health	0.029	0.389
Enjoyment	0.603	0.000
Learning	0.556	0.000

Based on Table 3, it was found that there was no significant relationship between physical aspects classroom environment with health ($r = 0.029, p > 0.05$), while there is a significant relationship with enjoyment ($r = 0.603, p < 0.05$) and learning ($r = 0.556, p < 0.05$). This finding indicates the physical aspects classroom environment did not affect students' health but affects students' enjoyment and learning in the classroom. This means that the student will be able to learn effectively, gaining useful learning experience and enjoy their learning while in a conducive and comfortable classroom. Therefore, attention should be given not only in delivering the content alone, but also to the classroom learning environment. There is sufficient research evidences stated that the building in which students spends most of their time does influence how well they learn' (Earthman, G 2004:18). Bunting (2004) argued, today's schools must create spaces that students want to go to, similar to the way cafes attract people. Traditional classrooms may disappear, replaced by holistic learning labs and exploratory centres (Butin, 2000; Keep, 2002 in Stevenson 2007:3). Therefore, traditional classrooms must change and proposes a model of a generic space for students to be co-located with

teachers and this space should be decorated by the students to give them ownership (Bunting, 2004).

CONCLUSION

In this study, it was found that the suitability of the physical aspects classroom environment were at the high level for furniture, lighting facilities while moderate level for air quality, color and space. The students also perceived that the physical environment have an impact on students' health, enjoyment and learning. In addition, there was a significant relationship between the physical aspects of the classroom environment with students' enjoyment and learning. Therefore, the physical aspects of the classroom environment should be given more attention to improve the effectiveness of learning and teaching.

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