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## Improving the Classroom Physical Environment: Classroom users' perception

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### Abstract

The purpose of this paper is to investigate classroom users' perception on their conventional classroom and how they perceive on the preferred classroom physical environment. The sample of this study was done in one secondary school in Klang district. There are 60 respondents who volunteered to participate in this study comprising of 50 students from form 3 to form 5 and 10 volunteers among teachers. The method of this study was to use a questionnaire survey both for teachers and students as classroom users'. The results are 90 percent of classroom users' agreed that changes in the classroom environment need to be implemented.

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*Keywords:* Classroom physical environment; users' perception; educational environment

### 1. Introduction

As stated by Ramli et al. (2012), Malaysian school students spend most of their time in the school compound. Accurately, they are spending more than 25 hours per week in a classroom physical environment. Jabatan Kerja Raya Malaysia (JKR) had standardized the Malaysian size for the classroom as 24 feet x 30 feet with 30 students and one teacher per classroom. However, there are problems today with the number of students increasing every year. Thus, it has increased the number of students in every classroom. Nowadays, there are over 35 students in each class in urban schools. Some of the schools has up to 45 or 50 students per class (Nazir, *interviewed*, Sept 19, 2012; and PPD Klang, *interviewed*, Sept 12,

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2012). These numbers will increase each year and consequently, it creates an inconvenient classroom environment for students and teachers.

Traditionally, designing the learning spaces are the responsibilities of architects, interior designers and usually not teacher-practitioners, but the architects and interior designers are not educational imaginary, often leading to the reproduction of the industrial model of classrooms, with notable exceptions (Jamieson et al., 2000; Abbasi, 2009). Sanoff (1991) agree that end users' perception also important in designing the learning spaces in order to understand their preferences on the classroom physical environment.

Thus, this research investigates how the classroom users' perceive about their classroom physical environment and what they want to be improved as the end users' perception. It is crucial to know and understand what they perceive in order to improve the Malaysian school environment in line with the government aspiration to improve Malaysian school students' performance. As emphasized by Sahimi and Said (2011) that to provide a better learning experience for the students, it is important to understand young children's perspective, their emotions, needs and interest towards their environment. Hence, this research investigates both students' and teachers' perception of classroom physical environment to gain a clear perspective about their preferences.

## 2. Research method

### 2.1. Participants

This pilot study was based on classroom users' which are students and teachers from Sekolah Menengah Kebangsaan Raja Lumu, Pandamaran, Klang. In July 2012, data was collected from 60 volunteers from students and teachers (n=60). Researcher distributed 50 questionnaires to students and 10 questionnaires more for the teachers.

The volunteer students were from Form 3 to Form 5. There are 34 students from Form 5, 10 students from Form 4 and 6 students from Form 3. The volunteer teachers were from different field of teaching. There are four volunteer teachers both from the Field of Language and Humanities and the Field of Sciences and Mathematics, and two teachers from the Field of Techniques and Vocational.

### 2.2. Questionnaire design

The survey was done in two phases. Phase one was held one week before phase two. Phase one survey asked about how the classroom users' perceive on their conventional or current classroom whereas the phase two survey asked about what they perceive on the preferred classroom physical environment. The questionnaire design followed a visual questionnaire design by Sanoff (1991) but has been changed to suit the Malaysian classroom environment. The questionnaire survey form included open-ended and close-ended questions which using the nominal, Likert scale and writing a list of *wish poem*.

The phase one questionnaire is divided into three sections - section A is about the respondent's background, section B( 25 questions) asked about the users' perception on their conventional classroom, and section C is a *wish poem* which the users' fill in the blank on what the users' want to be improved in their classroom physical environment. The 25 questions in section B were divided into seven categories which are the brightness, seating arrangement, interior variety, furniture setting, students' participation in class, view to outdoors, and the overall preference. The categories have been identified as the following items:

Table 1. Identified items in categories of section B questions (conventional classroom)

No.	Categories	Items Identification
1.	Classroom Brightness	Amount of light in the classroom (daylight and artificial)
2.	Seating Arrangement	Variety of seating arrangement and additional spaces (interactive or non-interactive that promote or discourage communication between students)
3.	Interior Variety	Variation of textures and materials used for walls and ceiling, the amount of user adornments such as paintings, pictures, maps)
4.	Furniture Setting	Variation of furniture setting such as own lockers, book racks, and etc.)
5.	Students' Participation in Classroom	Students' participation in classroom in term of seating arrangement or decorating class
6.	View to Outdoors	Any outdoor view
7.	Overall Preference	Overall rating of all factors that student consider important to the classroom physical environment

Phase two questionnaires were asked about their preferred choice of classroom physical environment based on the visual new layout and designed. The researcher re-designed the classroom setting based on the classroom users' perception on their conventional classroom and what they wanted to be improved. The new classroom design was used the standardized real classroom size but with a different layout setting. However, the visual question including three conventional layouts and additional three new layouts. Below are the layouts as in the visual questionnaire. Figure 1 is the conventional layouts whilst figure 2 is the new layout design.

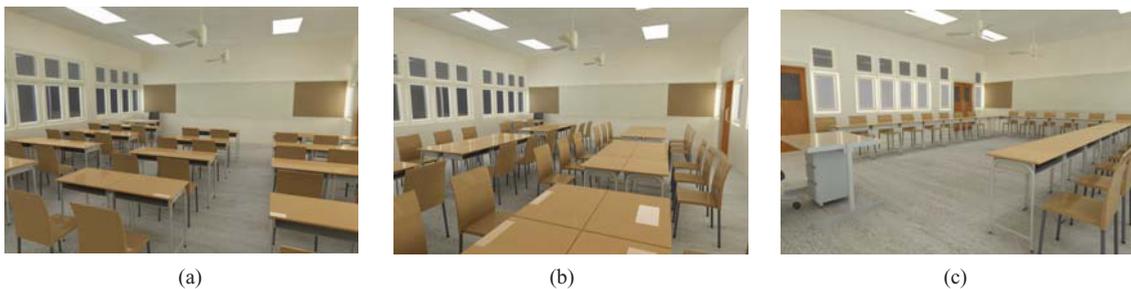


Fig. 1. (a) layout A- rows and columns; (b) layout B-modular or groups; (c) layout C-U-shape arrangement

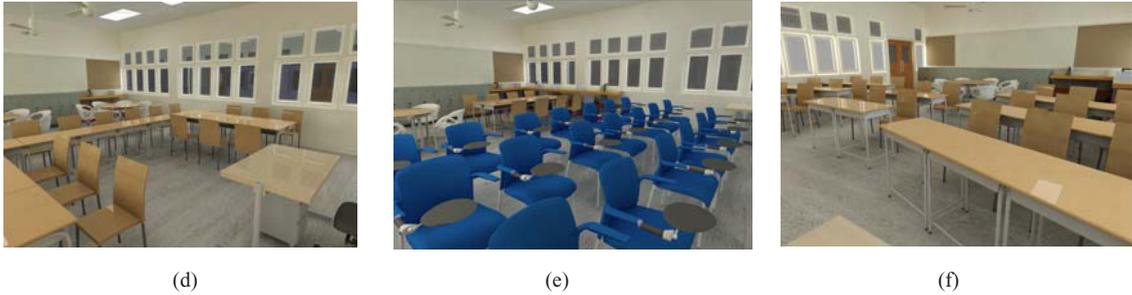


Fig. 2. (d) layout D; (e) layout E; (f) layout F

### 2.3. Data analysis

This analysis attempts to achieve the objective which is to investigate the classroom users' perception on their conventional classroom and how they perceived on their preferred classroom physical environment. Descriptive statistic was used to examine the data collection. It provides a simple summary of what the classroom users' perceive about their physical environment and what they want to be improved. The close-ended questionnaire had been analyzed by mean score whereas the open-ended question in *a wish poem* was analyzed by categorization as Sanoff (1991) studied.

## 3. Result and discussion

Research results will be discussed in three phases. Phase one discuss on students' perception result, and phase two discuss teachers' perception result. Hence, the phase three will be comparing the results, discussed and conclude as the classroom user's perception.

### 3.1. Result of students' perception

Table 2 below showed the mean score of categories in the section B questionnaire which is about perception of conventional or current classroom. Based on this study, it is found that 86 percent students agree that classroom brightness are acceptable for learning and teaching process (mean 3.81). Furthermore, 94 percent disagree that they had changed their classroom seating arrangement regularly (mean 3.90). The students said that they used the same seating arrangement the whole year of schooling. Most of the students disagree that they have interior variety in their classroom, but 24 percent agree that they have interior variety in their classroom (mean 1.76).

Furthermore, 56 percent students agree to add new furniture setting in their classroom (mean 2.89). Whereas, 44 percent disagree to additional furniture as they were concerned about classroom size that not being enough to add more furniture setting. 78 percent students agree that they were not involved in classroom arrangement and decorating (3.15). 66 percent of students disagree that they have a good view to outdoors (mean 3.08). Yet they have the same opinion that they wanted a good view from classroom to

school gardens. Lastly, 76 percent of students perceive that classroom physical environment needs to be improved (mean 3.27).

Table 2. Categories of Section B Questions (Students’ perception of current classroom)

No.	Categories	Mean Score
1.	Classroom Brightness	3.81
2.	Seating Arrangement	3.90
3.	Interior Variety	1.76
4.	Furniture Setting	2.89
5.	Students’ Participation in Classroom	3.15
6.	View to Outdoors	3.08
7.	Overall Preference	3.27

Furthermore, the researcher had listed 10 things that the students wanted to be improved in their classroom physical environment which the students answered in section C (*wish poem*). The first item that the students most wanted thing is having their own lockers to keep their belongings. Second is an air conditioner followed by chairs with upholstery. Next item is additional spaces such as IT space and reading space. Moreover, they need more space to make the class more comfortable for learning which means building a bigger classroom or reducing the number of students in the classroom. Most of the students wish to have a classroom that faces the school gardens. Additionally, the students wish to have a grouping table in their classroom and a bigger table for them to keep their books. Lastly, they wish to have a television in their classroom so that they can use to watch and learn from Astro Tutor channel.

Phase two questionnaires reveal that 94 percent of students agree to change their current layout to others layout setting. As a result, 29 out of 50 students which are 58 percent perceived that layout F is the preferable layout for the classroom. The layout design includes an additional own locker for students, spaces for discussion and a small reading area with book racks. Followed by 18 percent choose layout B which simple layout of grouping table arrangement. The students prefer to do group work during the teaching and learning process. Layout D and E each scored an average of 8 percent which 4 students each agreeing to use this classroom layout to replace their current classroom physical environment. Less favorite choices are layout A and C which is rows and column layout and U-shape layout as shown in figure 3 below.

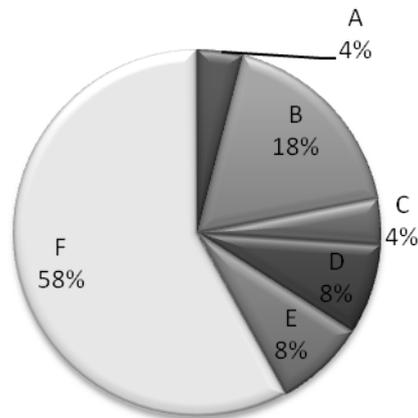


Fig. 3. Students’ preferred layout arrangement

### 3.2. Result of teachers' perception

Table 3 below will show results of teachers' perception of a conventional classroom. Based on this study, it is found that 80 percent teachers agree that classroom brightness is acceptable for learning and teaching process (mean 3.79). 80 percent disagree that they had to change their classroom seating arrangement regularly (mean 3.79). The teachers felt that they can't change the seating arrangement due to the number of students in the classroom. However, the teachers agree that seating arrangement plays an important role in order to attract students in the learning process. 90 percent teachers agree that current classroom has an interior variety (mean 3.90) and 60 percent teachers agree that their current classroom needed to add new furniture setting in order to improve their classroom physical environment.

20 percent teachers agree to get students' involved in classroom arrangement and decorating, but 80 percent disagree with this statement. They felt that the students can't get involved in classroom arrangement because classroom arrangement is related to the classroom management which the teachers as leader need to choose to suit the students' behavior. It is also related to the classroom control and pedagogical approach that the teacher used in the learning and teaching process. Nevertheless, 100 percent teachers agree that they want their classroom facing the school gardens. Teachers believe that facing the school gardens make the students feel more comfortable and focused during the learning process, and it will increase enthusiasm in teaching and learning process. For overall preferences, 90 percent teachers agree that changes on space and furniture layout setting needed to be implemented.

Table 3. Categories of Section B Questions (Teachers' perception of current classroom)

No.	Categories	Mean Score
1.	Classroom Brightness	3.79
2.	Seating Arrangement	3.79
3.	Interior Variety	3.90
4.	Furniture Setting	3.00
5.	Students' Participation in Classroom	1.87
6.	View to Outdoors	4.00
7.	Overall Preference	3.89

There are additional items that teachers had listed in their *wish poem* compared to the students list. The teachers also listed to have lockers for students, an air-conditioning classroom space, reading space in the classroom and grouping tables. However, additional space and fewer students in the classroom had become the most important item in the list. Teachers also added to the list of having a one session school. They preferred to have LCD projector or ICT equipment for each classroom in the school. They hoped that furniture especially chairs and tables are designed to suit the size of students' for example, bigger students as opposed to smaller students. Lastly, the teachers want good natural ventilation system flow into their classrooms.

Phase two questionnaires showed that 5 out of 10 teachers agree to choose layout F as the preferred layout for their classroom arrangement. 30 percent teachers prefer the conventional layout of their classroom and 10 percent teachers choose to have both layout B and D in their classrooms. However, the teachers did not choose layout C and E because it has a same style which is U-shape layout. Teachers perceived that the U-shape arrangement is not suitable in the classroom because it will disturb the student attention and focus during the teaching and learning process. It is because students are facing each other and it will encourage the students to talk and play than have a discussion among them. 3 out of 10 teachers that chose the current layout felt that this is the suitable layout to help the teachers in controlling and managing their classroom. Teacher that chose layout B stated that the suitable layout for the

classroom is modular or grouping arrangement because it can enhance the students' participation while teaching and learning process. It also can enhance more interaction between students and it can help weaker students so that they have not left far from others while studying.

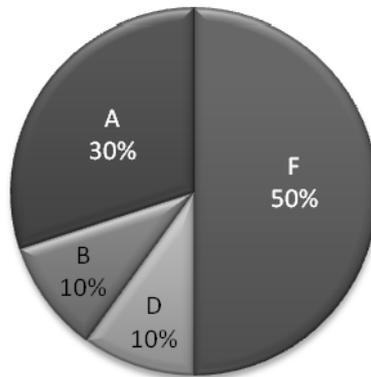


Fig. 4. Teachers' preferred layout arrangement

### 3.3. Discussion

There are significant different point of view between students' perception and teachers' perception. Students perceive more on enjoyment and fun learning classroom space. However, teachers are thinking more about the consequences of changing the classroom physical environment whether it is suited to their pedagogical approach or whether it can help them in controlling and managing their classroom. Yet, it still has the same perception, which is to implement a new classroom layout and changing the furniture setting.

Students and teachers both chose to have lockers in their classroom to keep students belonging such as textbooks and bags. They also agreed to have ICT equipment such as LCD projector, computer and television in order to enhance the quality of teaching and learning process. Furthermore, students and teachers agree that their current classroom is too hot and uncomfortable to learn thus the second consideration of other important things to add an air conditioner for their classroom. Moreover, facing the school gardens as the view from inside of the classroom to outdoors view is equally important which means improving the school landscape is also crucial to the end users.

In addition, more space and fewer students in the classroom make the teachers and students feel much more comfortable and it can enhance their teaching and learning performance in class. They also agree to have a small reading space in class with additional grouping table for discussion area in the classroom. Nevertheless, teachers agree to have an appropriate size of furniture especially tables and chairs for students and hope to have a better school design that can gain more natural ventilation in the classroom space. On the other hand, to the students, they want to have a good WiFi or internet connection than furniture setting because for students, learning in an enjoyable environment when using the internet and the computer is much more attractive during the teaching and learning process.

For the above reasons, most of the teachers and students perceive layout F as the most preferable layout if they had a chance to change their classroom physical environment. In addition are others items listed before such as the students' locker, ICT equipment, classroom that faces the school gardens and fewer students in the classroom. Furthermore, the second choice of preferable layout is layout B, which has modular or grouping layout. Teachers and some students stated that using the modular layout in the

classroom can help them in the learning process whereby the good students can help weaker students if the teacher mix their seats in one group. It's also suitable for teachers to use students-centered approach of teaching and learning since the new education valuation which is using the *Penilaian Berasaskan Sekolah* (PBS) started in 2012.

Nonetheless, some teachers and students disagree to choose others layout than the current classroom layout. Teachers stated that others layout will make the teachers unable to control the classroom, and it is better with the current layout. Some students also agree with that statement and stated that students are much more quiet with the rows and column layout than others layouts that can easily disturb the students focus and attention in the classroom. For that reason, maintaining the current layout with the addition of more furniture setting and space as well as reducing the number of students can enhance teachers' and students' performance.

It is concluded that the layout and arrangement are related to the number of students in the classroom. Moreover, both teachers and students perceive that reducing the number of students in the classroom is also an important factor as well as implementing a new change on space and layout in the classroom in order to improve their performance in teaching and learning process.

#### 4. Conclusion

The study show that teachers and students have their own opinion about their current classroom and this research result can actually contribute to the designing of a new classroom for future development. However, we always overlook the important things of the end users' perception as they are the ones using the classroom space the whole year in the school compound.

Recent researchers suggest that a *participatory* research approach will enhance teacher practices and in turn will benefit students' learning experiences (Temple, 2007; Higgins et al., 2005; Fisher, 2002). In designing classroom spaces, users' perception such as teachers and students are also important. In this case, taking into consideration the student and teachers or pedagogical perspective is important as they are able to express a distinctive vision for their classroom and then working with designers and architects to create integrated solutions for better classroom physical environment improvement (Higgins et al., 2005; Fisher, 2002; Morgan, 2000).

One of the significances of this study was to provide vital evidence of classroom users' perception such as teachers and students towards their current classroom situation in order to enhance better learning environment. Moreover, it is to further boost the awareness about the importance of classroom physical environment and to improve classroom design in line with government aspirations to improve students' and teachers' performance towards world-class education.

In this case, classroom physical environment including classroom layout and arrangement need to change to suit to the new education valuation which is PBS. PBS assessment will evaluate every single student's performance in the classroom. Therefore, reducing the student number in the classroom will help teachers focus more on each student's performance. Changes in classroom layout and seating arrangement as well as additional furniture setting will enhance students' outcome, and it can facilitate both teachers and students in their teaching and learning process.

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## References

- Abassi, N. (2009). Pathways to a better personal and social life through learning spaces; the role of school design in adolescents' identity formation. Faculty of Architecture, Building and Planning. Melbourne, University of Melbourne. Unpublished Ph.D thesis.
- Fisher, K. (2002). Re-voicing the classroom: a critical psychosocial spaciality of learning. Rubida Research.
- Higgins, S., E. Hall, et al. (2005). The impact of school environments: a literature review. The Centre for Learning and Teaching, School of Education, Communication and Language Science, University of New Castle.
- Jamieson, P., K. Fisher, et al. (2000). "Place and Space in the Design of New Learning Environments." *Higher Education Research & Development*, 19(2), 221 - 236.
- Morgan, J. (2000). "Critical pedagogy: the spaces that make the difference." *Pedagogy, Culture & Society*, 8(3), 273 - 289.
- Ramli, N. H., Masri, M., Taib, M.Z. & Hamid, N. A. (2012). A comparative study of green school guidelines. *Journal of Procedia - Social and Behavioral Sciences*, 50, 62 – 471.
- Sahimi, N.N., & Said, I. (2011). Young children selections of physical elements in the preschool environment. *Journal of ASIAN Behavioral Studies*, 1(2), 69-80.
- Sanoff, H. (1991). *Visual research methods in design*. New York: Van Nostrand Reinhold.
- Temple, P. (2007). *Learning spaces for the 21st century: A review of the literature*. Centre for Higher Education Studies, Institute of Education, University of London.