Future Classroom Concept for the Malaysian Education System

Mahizer Hamzah¹, Noraini Mohamed Noh², Norazilawati Abdullah³, Wong Kung Teck⁴

¹²³⁴Universiti Pendidikan Sultan Idris
mahizer@fpm.upsi.edu.my¹

Article History: Received: 10 November 2020; Revised: 12 January 2021; Accepted: 27 January 2021; Published online: 05 April 2021

Abstract: The aim of this study is to realise the establishment of virtual schools in accordance to the existing education system in Malaysia. This study examines the views of experts who are directly involved in the education system in Malaysia through the use of the modified Delphi technique. A total of 13 experts were interviewed individually and discussions involving two focus groups were conducted. The responses of all panel members were recorded and the agreement obtained will guide the formation of a virtual school model. The findings from the interviews conducted with individual experts found five key factors in the establishment of future classroom, which are implementation, approach, flexibility, technology and space. The findings of this study have also suggested that the design of future classrooms in the current educational environment in Malaysia is hindered by financial constraints, lack of technology infrastructure, physical environment and the current classroom layouts.

Keywords: Education system, classroom, Malaysia

1. Introduction

The advancement of technology has changed how we live. Apart from the communication sector, the education sector in Malaysia is also affected by the development of sophisticated information and communication technology. In Malaysia, rapid technology development has impacted the existing education system. For instance, more and more pre-graduate, graduate and post-graduate programmes have changed their delivery system from the traditional face-to-face approaches to online learning by using the latest technology in line with current developments.

At the school level, the government under the Ministry of Education Malaysia (MOE) has spent millions annually to provide technology facilities in schools for the benefit of students and teachers. In addition to physical facilities such as computers, notebooks, smartphones and Internet networks, schools have also been provided with access to online learning management system (LMS) and content management system (LCMS). These systems could be used to support methods conventional teaching and learning. In addition to these support systems, teachers are also exposed to 21st century learning approaches in line with future educational developments to prepare students to become digital citizens.

Background and Research Problems

The rapid development of technology has changed the teaching and learning process into a process of transformation. The Ministry of education and other educational stakeholders have taken proactive measures to equip classrooms and lecture halls with the latest technology and tools that will support the transformation of education. Various classroom concepts have been introduced to facilitate educational transformation, including smart classroom, future classroom and digital classroom. To fulfil the government’s aspiration for 21st century learning, schools and other educational institutions have created smart classrooms. The use of technology in teaching is emphasised in these classrooms and technology is used to improve the quality of learning and to model future classrooms. However, the concept of future classrooms differs across different institutions.

There are many interpretations of the smart classroom concept. On one hand, some researchers advocated that lessons in smart classrooms should highlight the use of multimedia-based materials (Menon, 2015) or use various technologies during the teaching and learning process (Block, et al., 2015). On the other, scholars argue that establishing a smart classroom goes beyond the use of technology and futuristic layouts and should emphasise how students learn (Kerry Shoebridge, August 2014). Other researchers advocated that future classroom with the future should be humane, integrated, more open and encourage freedom, modern intelligence, facilitate interactive teaching and learning and ecologically appropriate (Wu, W. & Liu, X., 2013). Meanwhile, from the commercial point of view, technological equipment providers state that the future classrooms should comprise of sophisticated equipment they supply.
Based on these different viewpoints, the future classroom concept in Malaysia should be based on the current and future climate of the Malaysian educational system as a general guideline in establishing a standardised concept of future classrooms.

Research questions

1. What do the experts perceive as the key elements in future classroom design in Malaysia?
2. What are the experts’ inputs on the most suitable future classroom concept that could be implemented in Malaysia?
3. How do education experts perceive the appropriateness and practicality of the future classroom concept proposed?

Significance of Study

This study will provide a clear guidance to educational institutions and the Ministry of Education on the concept of a future classroom that is suitable for Malaysian schools, in accordance to the Malaysian cultural identity and the value of the local community.

Study Limitation

This study only applies to classroom designed based on the experts’ views. The design will consider the existing facilities and physical layouts of classrooms in schools funded by the Ministry of Education. Thus, the design might differ from newly designed classroom where the designer/architect has a full control over the design of the classroom.

2. Research Methodology

The modified Delphi Technique was chosen in this study because it is deemed as the best technique to obtain expert consent on the factors to be included in a novel, newly designed model. In addition, this technique presents a systematic way to combine individual decisions to reach a common decision (Helmer, 1968). The Delphi technique has three distinctive properties, transparency, controlled feedback and group statistical analysis (Armstrong, 1989; Dalkey, 1969). Saira Siraj (2008) further noted that the use of the Delphi technique allows experts to be more creative in expressing their ideas and views about a particular issue or question. The experts were involved in closed discussions to reduce the risk of their opinion being influenced by the more dominant or experienced individuals.

Other important factors that need to be considered when using the Delphi Technique is the selection of experts and panel size. According to Dalkey (1972), experts comprise of people who are experienced in a particular field. In this research, administrators, educators and university researchers were chosen as the panel of experts. These experts comprise of administrators working in different divisions of the Ministry of Education as well as those directly involved in teaching students. In this regard, according to Boonan, (1979), the right number of experts is able to determine the reliability and in-group bias on the consensus made. In total, the expert panel comprises of 48 experts, 4 are educational officers from the State Education Technology Division (BTPN), 6 are working in the State Education Department, 6 staff members from public universities and teaching training institutes, 6 principals and headmasters, 10 primary and secondary school teachers. Furthermore, 2 focus groups comprising 16 people were the selected from this group of experts.

This study uses the Delphi (modified) technique and is divided into two (2) stages:

1. Stage One – Collecting data by reviewing the relevant studies on future classroom concepts abroad and in Malaysia to develop the interview protocols.

2. Stage Two - This phase involves three (3) rounds of Delphi research to formulate a future classroom concept based on the consensus reached by the group of experts, as follows;

   a. Round One - Structured interviews involving Malaysian educational experts. The experts were interviewed individually and the interview protocol was decided during the first stage. The interview findings will form the basis for building a future classroom concept.
b. Round Two - Focus group interviews involved academic experts. These interviews aim to examine the experts’ opinion on the appropriateness and practicality of the proposed classroom concept.

c. Round Three - a continuation of the second round.

3. Analysis of Finding

Interview analysis

This section analyses the data obtained from the interview conducted with the experts, the findings are presented and discussed based on the research questions stated above.

Question 1: What do the experts perceive as the key elements for future classroom design in Malaysia?

In general, the panel of experts agreed that the future classroom model should take into account the climate and conditions of schools in Malaysia, specifically government funded schools. This is because some of these schools still have poor facilities. Based on the interviews conducted in the first round, 3 themes were identified, which are classroom space, technology and learning experience.

Classroom space

The experts shared different views on the space requirement for future classrooms. Some experts think that future classroom space should be flexible, hence there is a need for portable and movable furniture and equipment including LCD projectors and screens. A flexible room design will allow the space in the classroom to be modified to suit different purposes including for group work, teacher centred learning, group discussion and laboratory work. Expert 3 noted that:

“…. the public works department has set that the size of the classroom in schools is 3 bay (20 feet x 30 feet). This is considered small for classrooms with 30-35 students. Classroom could be equipped with portable and movable furniture unlike what it is now to make it easier for teachers to conduct a variety of learning activities.”

Several experts recommended that the number of students in one classroom should be reduced to just 20 to 25 people based on the classroom size set by the public works department to maximize the space available for each student.

The experts also shared that a fun and exciting space is a key factor for future classroom design, in addition to other elements like lighting, windows, colour scheme and accessibility are some of the most important factors. For lighting, experts suggest using blinds or blackout curtains to reduce glare. The ability to control the light’s brightness could also stimulate learning. The right light and colour combination should make a classroom look brighter and gives a sense of security and comfort to the students.

A small number of experts also recommended creating designated spaces for different learning activities. The use of designated spaces will provide the students with the opportunity to experience unique and hands-on learning activities.

Technology

The experts agreed that the technology available in the classrooms, like projectors, audio devices and podiums should be reliable and functioning. Future classrooms should be equipped by high tech tools like smart boards to replace traditional equipment like white boards. The use of devices like smart boards could help teachers to present lectures, recordings and other materials. Furthermore, interactive technology such as tablets or personal laptops (BYOD) will help to support information sharing. Expert 12 mentioned:

“... so far the MOE and the government have not been able to provide notebooks and tablets to all students. However, most students in the urban area have their own smartphones that can be used as a T&L support material, all they have to do is to students to bring their devices to school T&L purposes ...”

In the meantime, the experts suggested improving facilities in the classrooms, such as increasing working plug points to support the increasing use of technological equipment, including the use of private gadgets.
Moreover, there is a need to install reliable and authentic software so to optimise the use of the digital equipment in the classroom. In this regard, the use reliable software will streamline the synchronous or asynchronous content sharing such as recording lecture videos and video conferencing. In addition, Wi-Fi and internet facilities should be strong enough to accommodate high internet usage and the use of various software and equipment.

**Learning experience**

In creating a memorable learning experience, most experts feel that the teaching and learning process has shifted to become more student-centred. This is because teachers have considered students’ learning styles, learning needs and expectation in designing lessons and setting learning outcomes. Therefore, future classrooms should provide opportunities for collaboration and interactions between students and teachers, utilise more practical resources and knowledge that are related to students’ past and present learning needs as well as to equip them for future professional lives in the future. Expert 5 stated that:

"...21st century T&L emphasises on student-centred teaching methods where teachers act as facilitators in the classroom..."

while expert 7 argued that:

"...now the focus is on teaching and learning is more student-centred, like group activities, discussion and exploration, while the future may be different. Therefore, Future classrooms should take into account unprecedented future expectations."

In this regard, future classrooms need to be more dynamic to support a new and unexpected and new teaching and learning approach.

**Question 2:** What are the experts’ inputs on the most suitable future classroom concept that could be implemented in Malaysia?

Based on the findings from the expert interviews, several key factors for future classrooms in Malaysia have been identified. These factors are approach, flexibility, technology and space

**Approach**

Future classrooms should support different teaching approaches, whether student-centred or teacher-centred as well as different teaching methods according to the needs and wants of the teachers and students. In addition, classroom designers should take into account students’ learning style and preferences such as visual, logical, aural, verbal, logical, physical, group or individual learning in designing future classrooms.

**Flexibility**

Future classroom designs need to support flexibility in the teaching process. Thus, the layout of the classrooms could be modified to cater for learning activities planned on a particular day. Thus, the classroom’s layout could be changed accordingly whether to cater for group works and presentation or for individual works.

**Technology**

The use of technology is a major element in 21st century learning. In this regard, connection to the internet facilitates the use of technology in the classroom. One of the approaches that could be taken is the Bring Your Own Device (BYOD) concept. However, in the Malaysia context, the affordability of devices to students, as well as the existing policy on permission to bring electronic equipment to schools should be taken into account. In addition, the Ministry of Education has limited budget to equip all schools with the latest technology. It is posited that all future classrooms should be equipped with basic facilities such as internet access, LCD projectors and LCD display screens.

**Space**

There are 2 suggested forms of space for the future classrooms.
Mobile (moveable) / Dynamic space

A mobile space is better suited for smaller classroom. However, suitable furniture is required for this type of classroom. This space could be modified based on the teaching and learning activities and the students’ learning needs and style. For instance, the layout of the classroom could be changed accordingly to suit different learning approaches such as for group learning or individual learning. Thus, there is a need to use furniture that could be moved easily.

Figure 1. Dynamic space design (Large group and sharing knowledge)

Figure 2. Dynamic space design (Small group and collaborative design)

Figure 3. Dynamic space design (Individual and extended learning design)
Permanent space design

A permanent space could be created in larger classrooms with smaller number of students. In this light, each step is assigned for different function. This allows teachers and students to move freely between each space based on the teaching and learning methods and activities. In general, there are 3 permanent learning areas, large group section for knowledge sharing, collaborative section for small group works and individual section for individual work and revision.

Figure 4. Permanent space design

Figure 5. Diversity of learning spaces in permanent classroom design 1

Figure 6. Diversity of learning spaces in permanent classroom design 2
Question 3: How do the experts perceive the relevance and practicality of the future classroom concept in Malaysia?

The findings from the first round of interviews have helped the researcher to design the framework for a model of future classrooms in Malaysia. The model was designed based on the inputs from two focus groups comprising of academic staff from public universities as well as conference participants who are educators and school administrators.

Experts in both focus groups have given positive feedback on the proposed future classroom model, at the same time, they also posed several concerns and suggestions for the designed

1. Concern: The design of a future classroom requires a high cost, especially to purchase the suitable furniture and technology equipment. In this regard, schools might not be able to afford such expenses without the support of the Ministry of Education.

   Suggestions for improvement: It is recommended that schools utilise existing resources create classrooms based on the concept presented. For instance, the school could reduce the cost of classroom renovations by modifying the existing furniture instead of buying new ones.

2. Concern: The model does not detail the technological requirements for education 4.0 and the future.

   Suggestions for improvement: As the future classroom design concept is more focused on bring your own device (BYOD), it is crucial to provide strong and stable Wi-Fi connection to facilitate the use of existing technology and connectivity to the internet.

3. Concern: Unstable Internet access especially in the interior makes it difficult for teachers and students to get the information they need.

   Suggestions for improvement: In addition to Internet access, offline information sharing could be implemented where teaching materials will be saved into the browser for students and teachers to access offline. This facility only requires strong Wi-Fi without the need of strong internet connection.

4. Discussion and Summary

Summary of Future Classroom Models

In general, the study’s findings showed that the experts have highly positive views towards the proposed permanent and mobile / dynamic future classroom models. Both future classroom designs have considered the constraints faced by government-funded schools in Malaysia. In this regard, both future classroom designs have also considered student learning styles as well as the characteristics and interest of 21st century learners. At the same time, the designs have looked into various teaching methods in the classrooms, specifically teacher-centred, student-centred, technology-centred, content-based or materials based learning. The experts highlighted the elements that need to be included into classroom designs to facilitate support for not only face-to-face learning,
but also for distance, self and virtual learning. These elements comprise of various teaching and learning processes, strong Wi-Fi connection, and high quality technology and internet facility. Lastly, the experts also highlighted that most classrooms in government-funded schools may have smaller size and limited facilities, and renovating them requires a high cost.

5. Contribution of Study

In general, the findings of this study guide practitioners on future classroom designs, in accordance to the current educational environment in Malaysia where financial provision, technological and physical facilities, and available classroom space might be limited.

6. Conclusion

This study on designing a future classroom model is a step forward for the development of 21st century education. It has highlighted the role of approaches and technologies as the catalyst for the latest teaching and learning methods. This model also helps school administrators and the Ministry of Education on the suitable features of future classrooms in Malaysia to equip students with the competencies needed for Industry 4.0.

7. Acknowledgement

The authors would like to express their gratitude to Sultan Idris Education University (UPSI) and Research Management and Innovation Centre (RMIC) of UPSI for providing University Research Grant (GPU), project code : 2016-0168-107-01 and the facilities to carry out this research.

References