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The Development of Internal Frame for Ceiling based on VAK Learning Model

Dayang Najihah Awang Minggu[1], Maziana Mohamed[1*].

[1]Universiti Tun Hussein Onn Malaysia, Parit Raja, 86400 Batu Pahat, MALAYSIA

*Corresponding Author Designation

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Abstract: Teaching kit is one of the teaching aids that can be used by both teachers and students to facilitate learning especially in understanding technical subjects that need extensive imagination and ability to relate theory with practise. This teaching kit contains model material and equipment that can be used in practical works but with smaller scale where it can be mantle and dismantle the internal frames of ceiling based on Visual, Audio, and Kinaesthetic learning model. Therefore, this study is to design and develop the teaching kit of internal frame for ceiling based on VAK learning model. This study is also conducted to evaluate the functionality of the internal frame for ceiling in the teaching and learning process. Three selected experts will evaluate the internal frame of the ceiling. The instrument used was a set of questionnaires where it consists of 16 questions. The questions were divided into 4 sections, namely Part A - respondent's information, Part B - the design of internal frame for ceiling, Part C - the functionality of internal frame for ceiling in the teaching and learning process, and Part D - comments and suggestions. The collected data were analysed by using a descriptive statistics method. Overall, the design of the internal frame of ceiling caters to the VAK learning model and can be applied during teaching and learning process.

Keywords: Teaching Kit, VAK Learning Model, Internal Frame of Ceiling

1. Introduction

Abbas (2006) stated that, a teacher needs to provide extra learning materials to attain stimulus response such as by using a teaching kit where students can see, touch and use the materials, tools and procedures in improving their comprehension on certain topics specially to explain procedures on construction sites. Teaching kit is one of the teaching aids that can be used by both teachers and students to facilitate learning especially in understanding technical subjects that need extensive imagination and ability to relate theory with practise. According to Haizum & Lai (2011), the development of teaching kit is based on the objective of the learning topic where the teaching kit can become an aid in performing a teaching. The compatible teaching tools are important especially in technical subjects in the learning process (Ramlan & Suhaimi, 2010). This is supported by Ee (2003) where the usage of textbooks as a teaching aid is no longer relevant because it inattentive the students.

**Corresponding author: maziana@uthm.edu.my*

1.1 Problem Statement

Vocational subjects need high imagination, an understandable concept and principle where it is hard to be dominated if the learning is conducted verbally or well known as an old teaching method (M. Yasin, 2012). Critical thinking or student's development cannot be performed by applying the old teaching method since it emphasizes memorization or moderate procedure application where there is no creativity development in the conventional teaching method (Abu Bakar, 2003). Jonid (2010) suggested that the students needed to be given the opportunities to experience the work procedures by themselves. One of the compatible methods in the learning process is by using teaching tools to help the students to observe the relation between theory and the teaching and learning process (Hasan, 2002). Traditional teaching methods focus on only one or two types of sensory (Abu Bakar, 2003). The traditional teaching method is not actively involved in the class. Students' academic performance who are passive are lower than the students who are active (Gremli, 1996). The most effective way to learn is to combine the sense of sight, sense of listening and sense of touch (Tahar, 2004). Furthermore, teachers only focus on the usage of slides and notes instead of giving their attention to their students (Long, 2008). Hence, this teaching kit of internal frame for ceiling based on VAK learning model can be used by both teachers and students to facilitate learning especially in understanding technical subjects since it combines the sense of sight, listening and touching.

Teachers tend to use traditional teaching aids such as textbooks, notes and slides where students are used to the chalk and talk method applied and the tendency of students getting bored of the teaching aid used is high. When these traditional methods emphasize the memorizing technique and moderate procedure application in the learning process, it does not help much in the development of critical thinking of students. Hence, students cannot experienced by themselves the real situation of installation works for ceiling, bricklaying or anything relate to the hands on work. When the students does not experienced the installation works by themselves, they cannot memorize the components that are used in the installation works. Other than that, in the vocational college, priorities are given to the final year students to use the materials in the lab in order to complete their final year project. Thus, the junior students cannot perform their lab completely. Teachers hardly convey the contents of the topic without the teaching aid since the materials is not complete in some vocational colleges. Furthermore, teacher is not creative whenever it comes to conveying practical contents and it involved a lot of works in order to prepare the teaching aid. The information of installation works needs extra efforts to explain to students since the installation of the ceiling contains many materials, equipment and the steps. Therefore, in this study context, the teaching kit consist of all the element where the material and equipment can be seen, touched, read, mantle, dismantle and many more.

2. Methodology

The study kit will be evaluated from the design aspect and the functionality of the kit in the teaching and learning process. The questionnaire was conducted by using Google form and distributed to the expert. Experts endorsements by ergonomic design experts. building construction experts and industrial design experts.

2.1 Research Design

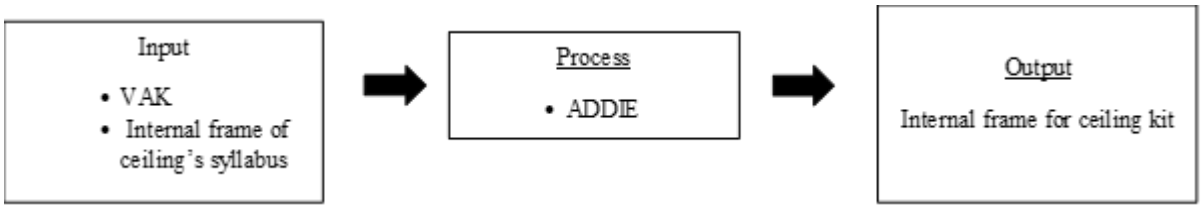

Figure1: Conceptual framework

Figure 1 displays the conceptual framework that was developed for the purpose of explaining and informing the process of the study being studied. This conceptual framework shows the flow of research that has been conducted. The main input for this study is the VAK learning model which consists of visual, auditory and kinaesthetic and internal frame of ceiling's syllabus. The VAK learning model in this kit is not only can be seen but it also can be touched, used, mantle and dismantled for every usage. The process was based on the ADDIE model which consists of Analysis, Design, Development, Implementation and Evaluation where in this study the step can only be taken until design phase. The output of this study in the teaching kit of the internal frame for ceiling.

2.1 Research Procedure

Before carrying out the study, observations were carried out in vocational colleges to identify student's behaviour whether they can differentiate the type of ceiling. This phase is known as the need analysis phase. The design phase takes into account the design, structure, theory approaches and technology used. After design, the development phase will take over. The suggested characteristics of materials for the teaching aid are long lasting, cost effective, easily mantle and dismantle, flexible and many more.

Experts validation conducted by three experts that were selected from different fields; ergonomic design experts. building construction experts and industrial design experts. This is to check and endorse the contents of the teaching kit. The teaching kit was evaluated from the design aspect and the functionality of the kit in the teaching and learning process. The questionnaire was conducted by using Google form and distributed to the experts.

2.2 Research Instrument

The data of this study were collected by using the questionnaire instrument and the questionnaire was divided into four sections, where it consists of 16 questions. The questions were divided into 4 sections, namely Part A - respondent's information, Part B - the design of internal frame for ceiling, Part C - the functionality of internal frame for ceiling in the teaching and learning process and Part D - comments and suggestions.

Then data analysed by using descriptive statistics. Descriptive statistics are used to see the percentage score of experts' level of agreements throughout the questions given. The percentage level is based on Determinants Level Schedule (Abdul Ghafar. 1999). The percentage rank from 0.0 until 39.9 will be categorized as low, 40.0 until 69.9 as medium and 70.0 until 100 percent as the highest.

Table 1: Determinants level schedule (Abdul Ghafar. 1999)

Percentage	Determinants Level
0.0 – 39.9	Low
40.0 – 69.9	Medium
70.0 – 100	High

3. Results and Discussion

3.1 Results

The data were collected and analyzed by using a percentage based on a questionnaire that has been distributed. To facilitate data analysis, each item was classified into groups and recorded percentages. By using Microsoft Excel, the percentage of agreement used to obtain the reading of agreement level regarding the teaching kit and classifies into different determinants level. The questionnaires were given to a teacher of vocational college, a lecturer of brick technology and a lecturer of industrial design. The results shown are supported by a value of 100% on all items which showed the result of the development of the internal frame for ceiling based on VAK learning model achieved a high percentage of agreement. Hence, this shows that the kit can be portable, easy to manage and each of the components can be mantle and dismantled. Other than that, this kit can help students to focus in the class, the design of the kit is safe to be used and helps to picture the installation of ceiling step by step visually. The agreement level of respondents is also high in terms of boosting the visual, audio, and kinaesthetic stimulus of students by using this teaching kit. The mantle and dismantlement of the kit helps the teacher to convey the contents to students step by step. By using this kit, students can touch, sense, install, mantle, and use the teaching kit of internal frame for ceiling all by themselves.

Table 2: Kit design

Items	Scale (%)					Determinants Level
	1	2	3	4	5	
The kit produced has a size that is easy to carry anywhere	0.0	0.0	0.0	66.7	33.3	High
The material used to develop the kit is user-friendly.	0.0	0.0	33.3	66.7	0.0	Medium
The materials used are safe and do not harm users.	0.0	0.0	33.3	33.3	33.3	Medium
This kit is easy to remove and retains after use.	0.0	0.0	33.3	33.3	33.3	Medium
The teaching kit is easy to operate.	0.0	0.0	0.0	100.0	0.0	High
Each component of the teaching kit can be assembled and removed	0.0	0.0	0.0	33.3	66.7	High

Based on the table, it can be concluded that experts agreed that the kit has a portable size that is easy to carry anywhere, the teaching kit is easy to operate and each component of the teaching kit can be assembled and removed. As for items, the material used to develop the kit is user-friendly, the materials used are safe and do not harm users and this kit is easy to remove and retains after use have medium agreement level whilst there is no item that has low agreement level.

Table 3: Functionality of kit in teaching and learning process

Items	Scale (%)					Determinants Level
	1	2	3	4	5	
The teaching kit can attract students to focus in the classroom.	0.0	0.0	0.0	66.7	33.3	High
Teaching kits of the ceiling can be used as a substitute for practical work that cannot be done during practical classes at Vocational College.	0.0	33.3	0.0	66.7	0.0	Medium
The design of this kit shows the features that are safe to use	0.0	0.0	0.0	100.0	0.0	High

The kit can be used to visualize the installation of the ceiling step by step	0.0	0.0	0.0	66.7	33.3	High
The use of the kit provides visual stimulation for students.	0.0	0.0	0.0	100.0	0.0	High
The use of kits provides sensory audio to students	0.0	0.0	0.0	100.0	0.0	High
The use of kits provides kinaesthetic sensory stimulation to students.	0.0	0.0	0.0	100.0	0.0	High
The concept of customization makes it easy for teachers to convey the content step by step	0.0	0.0	0.0	100.0	0.0	High
The cost of the frame kit in this ceiling is affordable.	0.0	0.0	66.7	33.3	0.0	Low
Students can touch, feel, install, open and apply the frame kit in the ceiling on their own.	0.0	0.0	0.0	66.7	33.3	High

Based on table 3, it can be concluded that, there are 8 items that have high agreement level which are the teaching kit can attract students to focus in the classroom, the design of this kit shows the features that are safe to use, the kit can be used to visualize the installation of the ceiling step by step, the use of the kit provides visual stimulation for students, the use of kits provides sensory audio to students, the use of kits provides kinaesthetic sensory stimulation to students, the concept of customization makes it easy for teachers to convey the content step by step, and last item with high agreement level is students can touch, feel, install, open and apply the frame kit in the ceiling on their own. As for medium and low agreement level, there is only one item respectively which is teaching kits of the ceiling can be used as a substitute for practical work that cannot be done during practical classes at Vocational College and the cost of the frame kit in this ceiling is affordable.

3.2 Discussions

Two main purposes of this study are to design the teaching kit of internal frame for ceiling based on VAK learning model and another one is to evaluate the functionality of internal frame for ceiling in the teaching and learning process. During the whole process of this research, there are several learning theories used to complete the development of this teaching kit as main guidance. Researchers chose the ADDIE model as a development model to produce the teaching kit of internal frame for ceiling and according to Mulyatiningsih (2016), ADDIE stands for Analysis, Design, Development, Implementation and Evaluations. It is one of the instructional design models constantly used as the basis in designing a model (Aaron & Tasir, 2000) since it is one of the systematic approaches. ADDIE involves designing and developing products with structured framework to ensure that the end products are creatively produced and in a good quality for teaching and learning purposes. Through this study, researchers obtained suggestions to improve the teaching kit where one of the suggestions is to use safe material in developing the kit. Other than that, researchers are recommended to resize the kit and add space or compartment to the kit box to facilitate the process of removing or re-storing the frame kit components in the ceiling and reducing the cost of kit costs to be more affordable.

4. Conclusion

The conducted study can be performed well and can explain in detail regarding the design and functionality of the teaching kit based on VAK learning model. The implementation of VAK learning model in developing sensory stimuli of students. This to enhance students' understanding of components that are used in the internal frame for ceiling installation before carrying out the practical works. Students' engagement can be improved in total to make the teaching and learning process

effective and enjoyable. Every aspect that has been obtained through analysis can be discussed precisely and improvement will be taken for future references. Overall, the development of this internal frame for ceiling hopefully can be well functioned and still relevant from time to time in teaching and learning process.

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