THE ASSESSMENT OF THE EFFECTIVENESS OF PRACTICAL COOKING HANDBOOK BASED ON AUGMENTED REALITY APPLICATION IN DOMESTIC SCIENCE

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ABSTRAK

Pelbagai inisiatif telah dilakukan oleh kerajaan bagi merealisasikan hasrat untuk melahirkan pelajar yang mampu menongkah Revolusi Industri 4.0 apabila mereka berada dalam dunia pekerjaan. Salah satu inisiatif yang telah dilakukan adalah pengaplikasian teknologi *Information Comunication Technology* (ICT) dalam bidang pendidikan. Aplikasi *Augmented Reality* (AR) adalah salah satu aplikasi ICT yang mempu mengubah corak pengajaran dan pemudahcara (PdPc) guru bagi mempersiapkan pelajar dengan kemahiran asas Revolusi Industri 4.0. Oleh yang demikian, satu buku telah di bangunkan berasaskan Aplikasi AR ini iaitu Buku Amali Masakan Berasaskan Augmented Reality bagi Subjek Sains Rumahtangga. Dalam kajian ini penilaian telah dilakukan keatas Buku Amali Masakan Berasaskan Aplikasi Augmented Reality bagi Subjek Sains Rumahtangga (SRT) bagi menilai kebolehgunaan Buku Amali Masakan Berasaskan Augmented Reality bagi subjek Sains Rumahtangga bagi meningkatkan tahap pemahaman pelajar dalam amali masakan. Penilaian berdasarkan model *Stake Countenance Model of Evaluation* dengan menggunakan borang soal selidik dan responden adalah terdiri daripada 12 orang pelajar yang mengambil subjek SRT di sebuah sekolah di Daerah Kluang, Johor. Dapatan menunjukkan kebolehgunaan Buku Amali Masakan Berasaskan Augmented Reality bagi subjek Sains Rumahtangga serta memberikan implikasi terhadap kefahaman pelajar yang semakin meningkat terhadap amali masakan.

Kata Kunci: Penilaian, Pengajaran dan Pembelajaran, Augmented Reality, Buku amali masakan, *Teori Stake Countenance Model of Evaluation*

ABSTRACT

Various initiatives have been made by the government in order to turn the desire to produce students who are able to win over the Industrial Revolution 4.0 when they are in the working world into a reality. One of the initiatives that has been done is by implementing the application of Information Communication Technology (ICT) technology in education. Augmented reality (AR) application is one of the ICT applications that can transforms the teacher's teaching and facilitating (PdPc) method in order to prepare students with the the Industrial Revolution 4.0. As a result, a book was developed based on this AR Application, a Practical Cooking Handbook based on Augmented Reality for the Domestic Science subject. In this study, the assessment was conducted on the Practical Cooking Handbook based on Augmented Reality for the Domestic Science subject to evaluate the usability of the AR Practical Cooking Handbook in increasing the students understanding level in cooking practicals. The assessment are based on the Stake Countenance Model of Evaluation using questionnaire and the respondents consists of 30 students who take Domestic Science subjects in a school in Kluang District, Johor. The findings demonstrate the usability of Practical Cooking Handbook based on Augmented Reality for the Domestic Science subject as well as implying that the students understanding related to cooking practicals have increase.

Keywords: *Evaluation, Teaching and Learning, Augmented Reality, Practical Cooking Handbook, Stake Countenance Theory of Evaluation*

INTRODUCTION

In the step to transform the education towards Industry Revolution 4.0, ICT usage should be used optimally in the education world. Various PdPc techniques using the power of technology have been created. Among the learning methods that use the latest technologies are virtual learning or better known as Frog vle, massive open online learning (MOOC), web based learning (WBL), mobile learning, learning through social media such as Facebook and Edmodo. But the newest technology in the industry is learning by using Augmented Reality (AR). The AR application is an application or a system capable of creating a real world view by inserting virtual objects generated by the computer into the reality. These virtual objects include objects in the form of 3-Dimensions that allow users to interact with virtual objects in real-time and interactively (Azuma, 1997).

In 2016, Norabeerah has stated that the AR application are capable in replacing an existing object, it can act as a simulation tool, able to attract user attention, it illutrate something clearly, helps in describing a process, capable of explaining the concept of space and act as an alternate tools to experiments. AR applications can also help in generating creative thinking as well as enhancing the student's understanding and changing the paradigm of students learning method towards more attractive learning and motivates the students more. With this advantage, a study has been done by developing a Practical Cooking Handbook based on Augmented Reality for the

Domestic Science subject. In this study, the researcher will evaluate the effectiveness of this practical book using a model based on the Stake Countenance Model of Evaluation. This assessment phase is the final phase of the development research approach.

According to Mohd Nazri (2014), the evaluation phase is an important phase for determining the suitability of the model and the theory used as a guide to the implementation of the Practical Cooking Handbook based on Augmented Reality for the Domestic Science subject.The suitability of this practical book is assessed through the use of Domestic Science students before they perform real practical activities in the classroom. To evaluate the usability of this cooking handbook, the researcher have conducted a usability tests to the students who took Domestic Science class. The purpose of this usability assessment is to evaluate the level of improvement in the students' understanding related to the cooking practicals that need to be done in the classroom. This research was conducted by using questionnaires answered by the students who took Domestic Science subjects in schools at Kluang District, Johor.

PROBLEM STATEMENT

In a study conducted by Siti Hajar (2013) shows that the use of technology by teachers in education is still low and only one-way learning takes place. One of the one-way learning methods that are mostly used by teachers is the demonstration method. This demonstration method is often used by teachers, especially for subjects that require practical work done by students. According to constructivism theory, knowledge can not be transferred from a teacher to student in its perfect form (Nafishah, 2007). Therefore, demonstration methods without prior knowledge and experience are difficult for students to master the skills in practice.

Usually the demonstration method used by the teachers will be carried out before the practical session executed with explaining method by the teacher before the student performs the actual practice. A study done by Afizal and Ahmad Fauzi (2015) found that teachers were more likely to use demonstration methods in cooking over the usage of ICT in their teaching. The research also shows that the students are more likely to show interest and more focus to cooking practical if the technology usage and teachers demonstration is by done using the latest technology in PdPc. Preliminary studies by researchers found that Domestic Science teachers were still utilizing the demonstration methods before cooking practicals were done by students. Preliminary studies also showed teachers only taught using the syllabus available in the textbooks and DSKP supplied by the Ministry of Education.

The findings from a research done by Noridahayu et al. (2015) found that the lack of interactive reference material will have affect the effectiveness of PdPc and thus the student's performance level will decline. Therefore, an interactive learning tool that uses the latest technology such as this AR application needs to be developed. The study of Danakorn et al (2013) emphasizes that studies regarding this AR application need to be done by other researchers because the ability of this application to stimulate, motivate and increase the involvement of students by looking at learning materials should be viewed from other different angles rather than just using demonstration methods by the teachers only. With the advantages of AR applications in education, the researcher feels that there is a need to develop a cooking handbook using this very AR application that can help teachers to diversify their teaching methods while also providing an interactive

learning experience along with building the knowledge and experience before the students perform real practical in school.

In addition, with the development of this AR application, it is hoped that it will give a positive impact on the student's ability in terms of increasing their level of knowledge in cooking practices in order to prepare them with culinary knowledge when working in the industry later.

RESEARCH OBJECTIVES

The objective of this research are;

1. To identify the level of usability of Practical Cooking Handbook based on Augmented Reality for Domestic Science subject.
2. To identify the usability of Practical Cooking Handbook based on Augmented Reality for Domestic Science subject in increasing the student's understanding level in cooking practical.

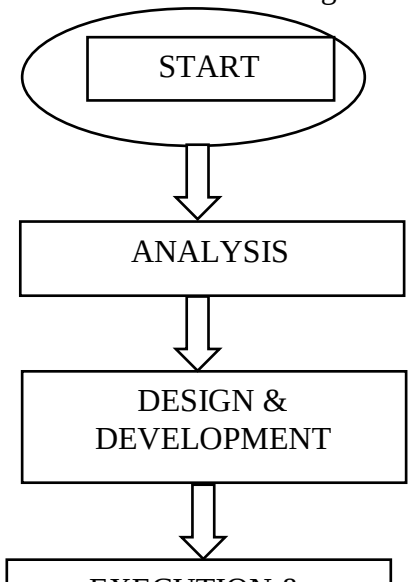
RESEARCH QUESTIONS

This research was conducted to answer these questions;

1. What is the level of usability of Practical Cooking Handbook based on Augmented Reality for Domestic Science subject?
2. What is the usability of Practical Cooking Handbook based on Augmented Reality for Domestic Science subject in increasing the student's understanding level in cooking practical?

RESEARCH DESIGN

This study is a case study and the findings are analyzed descriptively. The respondents of the study consists of 12 Form 5 students who took the Domestic Science subjects in 3 schools in Kluang district, Johor that had used the Practical Cooking Handbook based on Augmented Reality for the Domestic Science subject. This process is used to determine the usability of the developed book. In addition, this study will also examine the level of students understanding in cooking practicals whether there is an improvement or not after the students use this Practical Cooking Handbook.



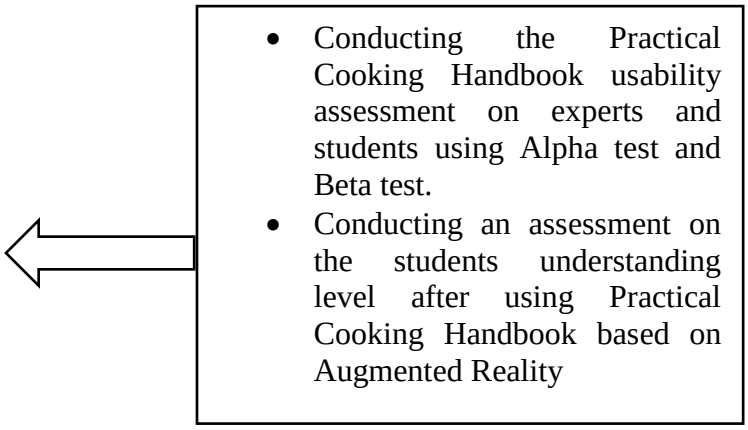


Figure 5.1 : Product Assessment Phase

Figure 5.1 shows the phase for the assessment of Practical Cooking Handbook based on Augmented Reality for Domestic Science Subject. The assessment will be based on the usability of this cookbook through an expert assessment and the consumer assessment which are the students through an alpha test and beta test. Additionally, the test will also be done to the end user of this book, that is the students in order to see the level of increment of the students understandings in cooking practical after they use this practical book. In this aspect, usability assessment refers to the Stake's Countenance model approach as a guide.

RESEARCH AREA

This research was be conducted on form five students that took Domestic Science as an elective subject at a daily secondary school. This research was done at the Kluang district, Johor.

SAMPLE AND RESEARCH POPULATION

In this assessment phase, the form five students that took Domestic Science in daily secondary school in Kluang district will be the main sample. Researcher have used the Stake's Countenance model approach in assessing the usability of the Practical Cooking Handbook based on Augmented Reality on enhancing the students understanding in prctical cooking.

Data Collection Method

The method of data collection in this study was through questionnaire. According to Abdullah, Md Noor and Aris (2007), the use of questionnaire forms can improve the accuracy and correctness of feedback given by respondents as they are not influenced by the behavior of researchers. This questionnaire form consists of three main sections to collect data as follows,

Part A: respondents demographics
Part B: The design of the Practical Cooking Handbook based on Augmented Reality
Part C: The usability of the Practical Cooking Handbook based on Augmented Reality in increasing the students understanding

The researcher use the Stake Countenance Model of Evaluation approach. According to Rubin and Chisneell (2008), the Stake Countenance Model of Evaluation is an assessment that describes the design by collecting data to identify and improve the shortcomings of a product. The essence of usability assessment according to Keller (1987) is the usability assessment of a product design and development is so that the product is useful and functional to use, can help the user achieve the objective, easy to use and the user is satisfied and enjoy using the product.

RESULT AND DISCUSSION

Questionnaire was used to get the data from the responden in order to answer the research objectives. The questionnaire developed for this research consists of three parts where Part A is Respondents information, Part B is for Design information and Part C is for students' usability information. All of the items contained in the questionnaire were analyzed using the Likert scale that has four levels which are strongly agree, agree, disagree and strongly disagree. A total of 30 respondents answered this questionnaire.

First Research Question

For the first research question which is the level of design for the AR Practical Cooking Handbook , the findings from this research are as follows;

No	Item	Result
B1	The color of AR Practical Cooking Handbook is interesting	100% agree
B2	The menu in AR Practical Cooking Handbook makes it easy to access information	100% agree
B3	The text used in AR Practical Cooking Handbook are appropriate and easy to read	100% agree

B4	The graphic visual displayed in the book is clear	100% agree
B5	Cooking practical video is easy to understand	100% agree
B6	The Practical Cooking Handbook based on AR is easy to handle	100% agree
B7	The question on the quiz link is easy to understand	100% agree

Based on the analysis that has been done, the researcher concluded that the Practical Cooking Handbook Design is very suitable and every accessible info were easy to understand.

SECOND RESEARCH QUESTION

For the second question that is the level of the Usability of Practical Cooking Handbook based on Augmented Reality (AR) for the subject of domestic science, the findings of this study are as follows;

No	Item	Result
C1	Audio can be heard clearly	100% agree
C2	Cooking video is easy to understand	100% agree
C3	Cooking video can help during practical cooking	100% agree
C4	Cooking video help me understand cooking method better	100% agree
C5	Cooking video helps increasing my knowledge in cooking	100% agree
C6	This book helps me to give explanation in practicals that I understand less	100% agree

Based on the second assesment result, it shows that the usability of the Practical Cooking Handbook can increase the student understanding level in practical cooking. This is in line with the study by Norabeerah (2016), which stated that AR application can help in generating creative thinking and the same time can amplify the student's understanding and changing the paradigm of students learning methods towards more engaging methods and elevate the students motivation higher.

CONCLUSION

The usability assesment in the research conducted uses Stake Countenance Model of Evaluation approach. This research was conducted using qualitative method and was

supported by open response questionnaire documents. The research design was divided into two parts where the first part was to evaluate the design of the Practical Cooking Handbook Based on Augmented Reality Application and the second part was to evaluate the products usability in increasing the student's level of understanding during cooking practicals. The researcher has carried out the planned experiment systematically based on the planning that has been explained in this research. The result of the research also illustrate that the Practical Cooking Handbook is very suitable to be developed as one of the teacher's teaching aids and as a reference for the students to amplify their undestanding in practical cooking that will be executed during formal education session at school. Moreover, the Practical Cooking Handbook also provides a new learning environment for students and can help students in building new experiences in practical cooking.

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