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Learning Shapes and Colors using JomLearn & Play Application for Children

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Abstract—Learning shapes and colors are the basic cognitive development for children. Children learn best through sorting size, shapes, and colors. Nowadays, most of the applications available are using English language. This study found that there are very limited applications using Malay language. The current existing applications are available in Indonesia language. “JomLearn & Play” is the application focus on children to learn the basic shapes and colors using Malay language. The method used is ADDIE model consists of analysis, design, development, implementation, and evaluation. The “JomLearn & Play” application can help for children in early stage to learn about shapes and colors.

Keywords—JomLearn & Play, shapes, colors, Malay language, ADDIE model

I. INTRODUCTION

Cognitive development is the construction of thought processes, including remembering, problem solving, and decision-making [1]. It allows the children to understand the relationship between ideas, to grasp the process of cause and effect and to improve their analytical skills [2]. Learning shapes and colors is a great way to develop children’s cognitive skills. The children’s visual processing begins in two keys areas, which are shapes and colors. First comes shapes, then comes colors! [3] Through this mobile application, it will help the children to understand the concept of shape and color.

The mobile application developed, in parallel with Malaysian education development plan 2015 to 2025 which is utilizing ICT to improve the learning quality in Malaysia. The used of ICT in learning process does not reach satisfactory level, both in terms of quality and quantity. ICT will help to strengthen teaching and learning process in education areas [4]. The survey found that, this mobile application can make learning process becomes interactive and fun to the children. This mobile application is built in Malay language. This is due to the study found that mobile application to learn shapes and colors are not available in Malay language.

II. MATERIALS

A. Shapes and Colors

JomLearn & Play application is an interactive application that can be accessed using mobile devices. This application focused on the shapes and colors specifically for preschool student who age below 6 years old. The apps focus on preschool student because an early childhood education is carried out as an effort to assist children in increasing their talent and interest of each child [5].

For children ages 4 to 6 years old, the basic lessons are about color, alphabet, number and shape [6]. Color is a popular aspect of the world for kid, and children are mindful of colors as a distinct realm, know color words and responds to color name and questions [7]. Naming colors is cognitively complex task to young children [8]. JomLearn & Play application helps kids to select and identify colors for things and its attributes around them easily.

Shape is a great way to give kids some vocabulary for describing the world around them [6]. Most of the children takes a longer time to grasp the concept of shapes [8]. Thus, teaching shapes is an important educational activity [6] to children as the are many types of shapes around them which adapted from the basic shapes.

Shape and colors are very important in developing learning media for kindergarten students [5] - [7]. Related to this, this project will be focusing on the basic shape and color for children in identifying and classifying visual information through mobile learning method. The use of technology helps a lot to keep kids interested as a successful strategy [5].

B. Existing Applications

There are many apps in English Language that concern about colors and shapes individually. However, there are only few that focus on colors and shapes separately using Malay Language. *Mengenal Warna, Belajar Bentuk dan Warna and Belajar Bentuk* are the examples of mobile apps for kids who age 3 years old and above using Indonesian Language. Thus, JomLearn is the apps that have both; color and shape, focus for Malaysian. The apps use Malay Language to be easily understood by preschool children. This application allows kids to learn first and interactively play with it with the addition of audio in Malay Language.

C. Mobile Application in Childhood Education

In early childhood, the use of electronic devices, enabled with internet connectivity, has been widespread in the everyday lives of western society. There are numerous explanations why parents use devices to encourage young children to use them. While it has advantages, it is evident that internet access actually has detrimental impacts on young children's growth and development processes [9]. Research has revealed that young children are very engaged with the apps and love to play with them for various amounts of time depending on their needs and interests and the content and structure of the application [10]. A mobile application is a computer program designed to run on mobile devices such as smartphones and tablet computers. A mobile application may also be known as an application or smartphone application [10]. The use of smart mobile devices among children is also growing exponentially as children have more access to smartphones through their parents. The ease of use, portability, speed and responsiveness of the smart mobile devices and especially tablets were said to make it an ideal learning tool [9].

III. METHODS

JomLearn & Play application is developed using ADDIE model. According to [11], ADDIE model is one of the systematic learning design models. ADDIE model is structured with sequences of systematic activities in an effort to solve learning problems. ADDIE model is simple, linear, and easy to understand, and it is suitable to use in mobile development applications [11]. This study developed a prototype for Android mobile platform to learn basic shapes and colors. This model consists of five stages namely analysis, design, development, implementation, and evaluation as shown in Fig. 1. Fig. 1 depicts the phases of developing the JomLearn & Play App. The explanation of each stage is described below.

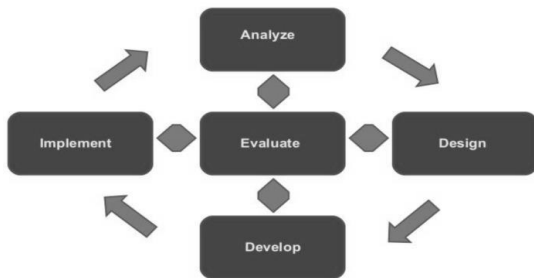


Fig. 1. ADDIE Model

A. Analysis

During this initial stage, the potential requirements of the application are methodically analysed and written down in a specification document that serves as the basis for all future development. The result is typically a requirements document that defines what the application should do, but not how it should do it. The system will be analysed in order to properly generate the models and business logic that will be used in the application. At this stage, the objective, problem statement and environment are being clarified in order to understand the project goal.

B. Design

Design is the second stage in ADDIE model which is at this stage covers technical design requirements such as sketches storyboard for JomLearn & Play App, the programming language that can be used, data layers, services, etc. A design specification will typically be created that outlines how exactly the business logic covered in the analysis will be technically

implemented. In this stage, the structure and flow of the project must be clearly stated which include framework, object, icon, and interface layout.

C. Development

In the development stage, the Build Box framework is a medium that is used to develop JomLearn & Play App. Build Box is a drag and drops game engine and one of the no-code game development platforms. It is focused on game creation without programming. Android Studio will be used to convert the app to the Android platform so that it can be installed in a smartphone that using an android operating system.

D. Implementation

JomLearn & Play App will be testing at this stage. Implementation is a stage in which JomLearn & Play App is installed into smartphones. At this stage, JomLearn & Play App has been tested and working smoothly. On the start-up and main page of JomLearn & Play App, the "JomLearn & Play" and start button will be displayed and introduce the application in the form cartoon character.

E. Evaluation

During this stage, JomLearn & Play App is installed on different smartphones with different android versions. The evaluation stage entails not just the evaluation and deployment of the application, but also subsequent support and maintenance that may be required to keep it functional and up to date.

IV. RESULTS AND FINDINGS

The test was conducted to 10 children's as a respondent to evaluate the JomLearn & Play App. The findings of the survey are presented and discussed under two sections as below.

A. Respondents Demographics

Demographic information consists of respondents gender and age. The result of respondents gender as shown in the Fig. 2.

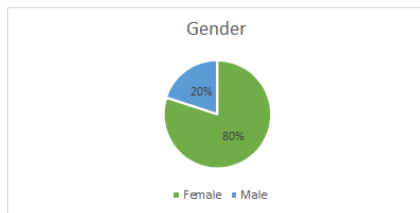


Fig. 2: Respondents gender

Fig. 2 shows the respondents gender. 80% (8 responses) were female while 20% (2 responses) were male children.

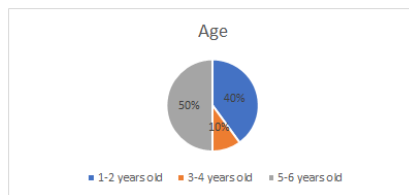


Fig. 3: Respondents age

Fig. 3 shows the age of the respondents. The results of the survey indicates 40% (4 responses) of the respondents were 1-2 years old, 10% (1 response) were 3-4 years old and the other 50% (5 responses) were 5-6 years old.

B. Respondents opinion on the "JomLearn & Play" application

This section contained 4 questions and was composed based on the previous research. It distributed to the respondents in order to get their opinions on the "JomLearn & Play" application as shown in Table 1.

TABLE 1: RESPONDENTS OPINION ON THE "JOMLEARN & PLAY" APPLICATION
(1 = STRONGLY DISAGREE, 2 = DISAGREE, 3 = NEUTRAL, 4 = AGREE, 5 = STRONGLY AGREE)

Questions/Scales	1	2	3	4	5
The game is fun.	0	0	0	70	30
My kid would like to play the game again.	0	0	0	60	40
"JomLearn & Play" app helps my kid to improve his/her understanding in basic shape and color.	0	0	0	70	30
"JomLearn & Play" app helps my kid to improve his/her understanding in Bahasa Malaysia language.	0	0	0	60	40

From the results presented in Table 1, it revealed mostly of the childrens agreed this game is fun which out of 10 childrens, 70% (7 responses) were "Agree" and 30% (3 responses) were "Strongly agree". None of them said this game was not fun. Besides, parents clarified their kids would like to play the game again which 60% (6 responses) answered with "Agree", and 40% (4 responses) answered with "Strongly agree". Next, majority of the parents agreed "JomLearn & Play" app helps their kids to improve his/her understanding in basic shape and color. The results are 70% (7 responses) agree and 30% (3 responses) strongly agree. This survey also revealed majority of the parents agreed "JomLearn & Play" app helps their kids to improve his/her understanding in Bahasa Malaysia language. 60% (6 responses) answered with "Agree" and 40% (4 responses) answered with "Strongly agree".

C. Respondents opinion on additional features

The survey indicated majority of the parents agreed additional features such as alphabets and numbers to be added in "JomLearn & Play" application.

V. CONCLUSIONS

JomLearn & Play application enables children to immerse themselves in a process of learning environment development via mobile application anytime and anywhere. The application could help children to learn basic shapes and colors using Malay language by learning while playing with it. The application would show the result based on the questions accordingly to measure their understanding. During the testing, this application can perform the activities as expected without any bugs and errors. Moreover, parents are able to guide their children using the application easily without any problems. As the result of users' evaluation, JomLearn & Play application can enrich children language in early stage of children development. This application currently could be installed in Android Operating System smartphone. For future work, this application will add more features for children learning materials and also able to run in crossed platform smartphone operating systems.

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