The Prototype of the Reading Learning Application uses Animated images on Android with the Black Box Testing Method

Ghulam Asrofi Buntoro¹*, Indah Puji Astuti², Dwiyono Ariyadi³

¹,²,³Program Studi Teknik Informatika, Universitas Muhammadiyah Ponorogo, Jl. Budi Utomo No.10, Ponorogo, Indonesia, 63471

e-mail: ¹ghulam@umper.ac.id, ²indahpujiastuti@umper.ac.id, ³dwiyono_ariyadi@umper.ac.id

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Abstract

Reading is a basic skill that children must have, because reading all knowledge will quickly enter and be understood by humans. To improve children's reading skills, it is necessary to have learning methods and media that are in accordance with the needs and development of children. Technological developments have made cellphones that were previously only used for calling and sending messages now become smartphones that have more features such as being able to do office work, video calls, games and much more. One of the most widely used smartphones and the most widely used by Indonesians is the Android-based smartphone. The ABACA application is an android-based reading learning application or knowing the alphabet. The application has been tested using the black box method with the results that all menu or application content is functioning properly. The hope of developing this application is that it can attract children's interest, especially preschool or kindergarten children, to get to know the alphabet. The ABACA app is equipped with a game menu to train your child to connect words and spell letters of the alphabet. The test results with the black box method on the ABACA application show that the menu is appropriate and functions properly as expected in the design document.

Keywords: Application; Mobile; Learning; Game; Android

1. Introduction

The Ministry of Communication and Information of the Republic of Indonesia in 2015 through its official website determined that the population of 250 million people in Indonesia is a large market in the marketing of smartphones. Smartphone users in Indonesia will also continue to grow year after year(Kementerian Komunikasi Dan Informatika, n.d.). Like research institutions, digital marketing, the number of smartphone users in Indonesia will increase from 67.1 million in 2017 to 99.9 million in 2021(Chadha, 2017). A survey carried out by the Ministry of Communication and Information in 2017 showed that more than 50% of Indonesian people have smartphones(Implikasinya, 2017). This statement is supported by statistical data published by BPS in 2018(Badan Pusat Statistik, n.d.), that is, cell phone users in Indonesia continue to increase in 2018, reaching 62.41%.

From the above data it can be approved by the Indonesian people who already use smartphones. From children, adolescents, housewives. Many parents have provided their children with Smartphones, in the hope that Smartphones can be used as a means of support for learning(Wulandari et al., 2020).

Data published by The Asian Parent Insights(Survey Tentang Smartphone & Tablet - Hasilnya Mengejutkan | TheAsianparent Indonesia, n.d.) in which the expectations of parents in the use of smartphones by children are not yet expected. The data shows the expectation of parents, children will be able to access educational applications up to 81%, they will help in the use of children in this criterion, reaching only 57%. The most popular game for children to compile is using a smartphone, where the figure reaches 72%. This has become the destruction of parents from the use of smartphones in early childhood school.

Zaini and Sunarto stated in their research(Zaini & Soenarto, 2019) that of the smartphone users in Indonesia that reached 177.9 million people, the largest contributor was in the category of children and adolescents. The results of research conducted by Heni and Mujahid showed a sample of 33
children, 24 agreed (72.7%) or more than half of preschool-age children as frequent smartphone users (Heni & Mujahid, 2018).

In a study by Febriati and Fauzia on the intensity of device use in preschool-age children in one day, children use smartphones for about 2 hours for games, YouTube, interactive programs, cartoons, or others (Intensity et al., 2019). But from these data, according to the criteria most read by children. You may respond that attracting children to use smartphones as a means of learning or reading is still very low.

Muludi et al. have created the Iqro application based on Android with the objective of alternative learning means iqro’ in addition to using the Iqro book (Kurnia Muludi et al., 2015). The application is interactive, making it easy for students to learn it. Busran and Yunanda have also created the iqro application for early childhood (Yunanda et al., 2015). The application is equipped with interesting images, so it is expected that students can easily create material effectively, efficiently and more fun. Faton et al. They have developed Android-based Al-Qur’an learning media (Fathoni et al., 2019). This application was developed with the aim of facilitating the teaching or delivery of material to teachers and also provides students to study anywhere and anytime, since this application can be installed on smartphones owned by parents or students.

Rokhim and Fuad have made alphabet letter recognition apps for young children using Android-based phones (Rokhim et al., 2015). This application already uses images and sound to attract interest in learning the alphabet. As stated by Amrulloh and Mulyoto about their research that provides applications that are not animated in interactive learning media, students cannot remember and memorize more quickly (Amrulloh & Mulyoto, 2016). No less than fostering an atmosphere of learning is one of the supporting factors that cannot be ignored. Foster an atmosphere of learning that can be accepted anywhere, anytime, anywhere. One of them is by creating an interactive Android-based learning medium that can make children learn anywhere, anytime (Astuti et al., 2020).

Based on the previous background, this research proposes to develop an Android-based ABACA reading learning application by not adding animation. The hope of building this application is that children are more interested in learning to read and can use smartphones not only to play but also to learn media.

2. Research Method

In this investigation, several stages were carried out, including starting from the problem identification stage, determining the solution to the problem, creating a design document, prototyping, and prototyping (Kustian & Parulian, 2020). These stages can be seen in the research framework described in Figure 1.

![Research Block Diagram](http://openjournal.unpam.ac.id/index.php/informatika)

**Fig. 1. Research Block Diagram**

2.1. Identification of problems.
- using smartphones not only to play, but also to learn
- attract children to recognize the letters of the alphabet

2.2. Determine the solution to the problem.
Create an ABACA application that is an application to learn to read accompanied by animated images based on Android

2.3. Create a design document
In this stage, use case diagrams, sequence diagrams and interface design of the ABACA application will be made.
2.4. Make a prototype
At this stage, start translating the design document to the program line (Gulo et al., 2020).

2.5. Prototype test
Testing with the black box test method (Rifai & Mailasari, 2020), that is, testing the menus in the ABACA application, is performed according to what was created in the design document.

3. Result and Discussion
The purpose of doing the design stage in building a system is to produce a good and correct design document so that it can be easily implemented in building a system that is as desired (Rivai et al., 2017). The ABACA application use case diagram can be seen in Figure 2.

In the ABACA application there are 3 main menus, namely a learning menu, a playback menu and also a form menu. The Form menu contains a questionnaire about the ABACA application, which is useful to evaluate the developer team in the development of the ABACA application.

In the learning menu, children will be introduced to the alphabet from A to Z. These letters will display animated images and their spelling when clicked. In the game menu, children will receive questions in the form of conjunctions accompanied by animated images. The way to answer is that the child will receive a random alphabetical display, and the child will choose the answer according to the spelling. The sequence diagram of the ABACA application can be seen in Figure 3 and Figure 4.

By prototyping this ABACA application interface design is also done at the design stage. The design of the ABACA application interface can be seen in Figure 5 - Figure 8.
The ABACA application test uses the black box test method, which consists of finding out if the menus contained in the application are executed according to what has been designed in the design document. The results of testing the menus in the ABACA application can be seen in Table 1.

Table 1. ABACA application test

| Input                  | Output                               | Results                                                                 | Display                  | Information |
|------------------------|--------------------------------------|-------------------------------------------------------------------------|--------------------------|-------------|
| ABACA Application Icon | Main page                            | The main page is displayed consisting of a learning menu, game, quiz form and also exit | ![Main Page Display](image) | Oke         |
| Learn Menu             | Letters of the alphabet A - Z        | Alphabetical letters A - Z are displayed                               | ![Alphabet Display](image) | Oke         |
| Alphabet B             | Animated images of the ball, spelling and how to pronounce it | Animated pictures of balls, spelling and how to pronounce them are displayed | ![Animated Images Display](image) | Oke         |
| Alphabet W             | Animated image of carrot, spelling and how to pronounce it | Animated carrot images, spelling and pronunciation                      | ![Carrot Display](image)  | Oke         |
| Play menu              | Word conjunctions contain random images, questions and alphabet letters | A conjunction of words containing animated images, questions, and also randomly ordered letters of the alphabet | ![Word Conjunctions Display](image) | Oke         |
4. Conclusion
ABACA application is a learning application to read or know the alphabet based on android. The application has been tested by the black box method with the result that all menus or content in the application runs well. The expectation of the construction of this application is to attract the interest of children, especially pre-school age children or kindergarten to recognize the alphabet with the appearance of the application in the form of an interesting animated image. The ABACA application is equipped with a play menu to practice the child's ability to connect words and spell letters of the alphabet. The results of testing with the black box method on the ABACA application show that the menus are appropriate and run well as expected in the design document.

5. Future Work
Suggestions for further research are to develop an animated image based learning application by adding Indonesian vocabulary, object names, animal names and for animation based on augmented reality on Android, so that children or elementary school students become more interested in learning to read with Android application-based learning media.

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