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Design of Android-Based Reading and Arithmetic Learning Application for Children Aged 4-6 Years

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ABSTRAK
Tujuan dari penelitian ini adalah untuk mengetahui bagaimana cara merancang dan mengimplementasikan aplikasi Belajar Baca dan Hitung berbasis Android untuk anak usia 4 hingga 6 tahun, aplikasi ini dibuat untuk memudahkan membaca dan berhitung yang menarik di tengah kecanduan menggunakan ponsel untuk anak usia 4 hingga 6 tahun. Aplikasi atau sistem ini dibuat menggunakan bahasa pemrograman Java dan MySQL, dimana aplikasi ini digunakan untuk memfasilitasi pembelajaran yang penuh dengan pendidikan modern dengan mengikuti perkembangan teknologi saat ini. Dan berdasarkan hasil implementasinya, telah berhasil membantu orang tua dalam memfasilitasi penggunaan Android dengan baik.

Kata kunci: Belajar, Membaca, Menghitung, Android, anak-anak, 4 tahun

ABSTRACT
The purpose of this study is to find out how to design and implement an Android-based Learning to Read and Count application for children aged 4 to 6 years, this application is made to facilitate interesting reading and counting amidst the addiction to using mobile phones for children aged 4 to 6 years. This application or system is made using the Java and MySQL programming languages, where this application is used to facilitate learning that is full of modern education by following current technological developments. And based on the results of the implementation, it has succeeded in helping parents in facilitating the use of Android properly.

Keywords: Learning, Reading, Counting, Android, children, 4 years old

Introduction

Global technological advances have affected all aspects of life, both in the fields of economics, politics, art culture and even in the world of education. The world of education must be willing to make positive innovations for the advancement of education and schools. Not only innovation in the field of curriculum, infrastructure, but also comprehensive innovation by using information technology in educational activities. Educational technology can change conventional learning methods into non-conventional ones. Computer technology functions as a tool in solving problems and issues in all fields, then one of its functions is as a learning medium. At the educational stage, children will be more interested in learning using animation because the material presented is easy to understand and makes children not bored. Along with the development of the times, the author realizes that technology brings many changes, in the world of learning with new learning methods such as animation which is more interesting and can be done anywhere. To overcome this situation, a learning method was created to convey material about Letters and Numbers

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packaged in the form of animation which is considered to be a more enjoyable learning method. According to Soetam Rizky (2019), design is a process of defining something that will be done using various techniques and involves a description of the architecture and details of the components and also the limitations that will be experienced in the process. In general, design is a stage after system analysis which aims to produce a design that meets the needs determined during the analysis stage.

According to Apriansyah (2020), Media Media in the perspective of education is a very strategic instrument in determining the success of the teaching and learning process. Because its existence can directly provide its own dynamics to students. The word learning media comes from the Latin "medius" which literally means "middle", intermediary or messenger. In Arabic, media is an intermediary or messenger from the sender to the recipient of the message. Gerlach and Ely said that media, if understood broadly, are humans, materials, or events that create conditions that enable students to acquire knowledge, skills, or attitudes.

Furthermore, in learning for children aged 4 to 6 years, the priority is the ability to read and count for students. Counting is the basis of several sciences used in everyday life such as addition, subtraction, division, or multiplication. For early childhood, being able to add and subtract and compare is very good after children understand numbers and figures (Erika, 2020). Meanwhile, according to Tarigan (2019), reading is a process carried out and used by readers to obtain messages that the author wants to convey through the media of words or written language. According to Annisa (2019), the definition of Android is a Linux-based operating system that is used as a manager of hardware resources, both for cellphones, smartphones and also tablet PCs. In general, Android is an open platform (Open Source) for developers to create their own applications that are used by various mobile devices. In its development, the Android operating system has undergone several changes and improvements. And the most interesting thing is the version of Android output which is named after food. According to Maarif (Android is a mobile device on an operating system for mobile phones based on Linux. According to Hermawan (2011: 1), Android is a Mobile OS (Operating System) that has grown amidst other OS that are developing today. Other OS such as Windows Mobile, i-Phone OS, Symbian, and many more.

Material and Methods

The research method used by the author in this study is the waterfall method. This method is a systematic and structured approach to software development. The waterfall method is carried out sequentially, by doing the work from top to bottom. This approach is supportive in facilitating the work of the tool, so that the development process becomes more organized and effective.

Results

The design results that are made include the main menu, game categories, questions, and several other additional menus that have been designed to be more interesting so that they can become educational, fun, effective and efficient applications. Here is a display of the first design results, there is the main menu:

1. Front Page View

   The Front Page is the first page that appears when we open the application and to continue the process we can press the Start Learning button to enter the application as shown in the following image:

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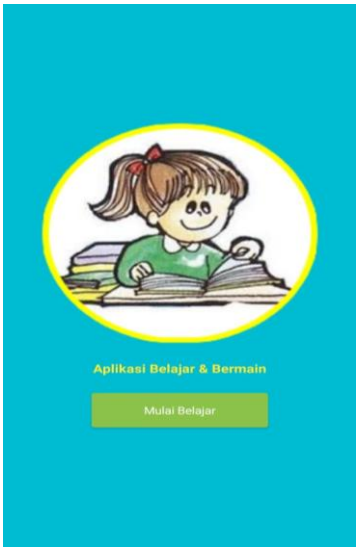

Figure 1
Front Page

2. Menu Page Display

The Menu page is a page that displays all the menus available on the application. As in the following image:

Figure 2
Menu Page View

3. Display of the Numbers and Counting Page

The Numbers and Letters Recognition Page is a page that contains several menus related to numbers and counting, the display is as follows:

Figure 3
Display of the Numbers and Counting Page

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4. View the Numbers Recognition Page

The Number Recognition page is a page that contains several lessons about number recognition, here is how it looks:

Figure 4
Number Recognition Page

5. View the Addition Learning Page

The Addition Learning page contains learning about the addition process, the display is as follows:

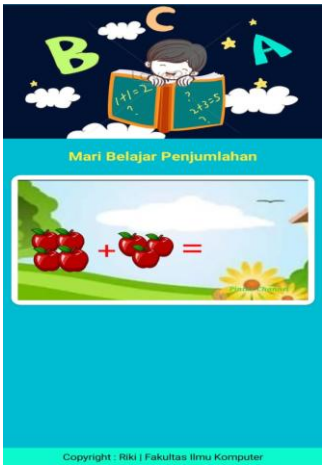

Figure 5
Addition Learning Page

6. Multiplication Learning Page View

The Learn Multiplication page contains learning about multiplying several numbers. The display is as follows:

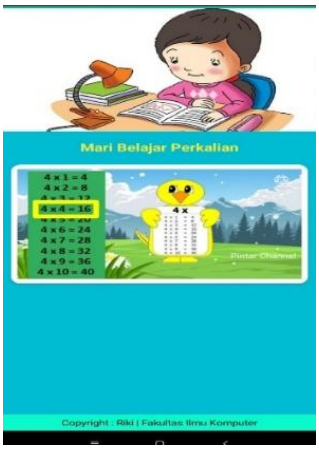

Figure 6
Learn Multiplication Page View

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7. View the Page Recognizing Letters and Reading

The Recognizing Letters and Reading page contains learning about letters and spelling several letters, as in the following picture:

Figure 7
View of the Letter Recognition and Reading Page

8. View the Alphabet Learning Page The Getting to Know the Alphabet page contains learning materials about the alphabet, as shown in the following image:

Figure 8
View of the Alphabet Learning Page

9. Appearance of the Vowel Recognition Page

The Vowel Recognition page contains learning about how to pronounce letters with their respective vowels, the display is as follows:

Figure 9
Page Recognizing Vowels

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10. Learning to Read Page Display

The Learning to Read page contains learning by spelling several letters, the display is as follows:

Figure 10
Learn to Read Page

11. Display of the Fruit Names Learning Page

The Fruit Names Learning page contains learning about fruit names, the display is as follows:

Figure 11
Page Recognizing Fruit Names

12. Display of the Getting to Know Transportation Names Page

The Getting to Know Transportation Names page is a page that contains learning about the names of means of transportation, the display is as follows:

Figure 12
Transportation Names Page

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13. About Application Page Display

The about application page contains information about the biodata of the application creator, the display is as follows:

Figure 13
About App Page

Problem Analysis

Problem analysis is a process of selecting problems into smaller elements to be studied with the aim of solving a problem from a running system. The results of the analysis carried out by the author so that they design an Android-based Reading and Arithmetic Learning Application for Children Aged 4 - 6 Years.

Solution to problem

To overcome this problem, it is necessary to create a system, namely by analyzing the running system so that reliable system results are obtained. The implementation of the intended program design is by using the php and mysql application programs with the following considerations:

1. The information system created is able to overcome existing problems, so that it can make information up to date because it is not only direct but also utilizes a system in the form of a website.
2. By using application programs, work efficiency and effectiveness can be increased.

Design Result Analysis

In accordance with what the author is working on, namely the Design of an Android-Based Reading and Arithmetic Learning Application for Children Aged 4-6 Years. then the results created can be accessed online.

Blackbox Testing

This testing is done at the end of software creation to find out whether the software can function properly. Here is the test table:

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Table 1
Blackbox Testing

TESTING ACTIVITIES	TEST RESULTS	CONCLUSION
Home Page Showing Home Page [√] Success	Home Page Showing Home Page [√] Success	Home Page Showing Home Page [√] Success
Menu Page Displaying Menu Page [√] Success	Menu Page Displaying Menu Page [√] Success	Menu Page Displaying Menu Page [√] Success
Recognizing Numbers and Counting Page Displaying Recognizing Numbers and Counting Page [√] Success	Recognizing Numbers and Counting Page Displaying Recognizing Numbers and Counting Page [√] Success	Recognizing Numbers and Counting Page Displaying Recognizing Numbers and Counting Page [√] Success
Number Recognition Page Displaying Number Recognition Page [√] Success	Number Recognition Page Displaying Number Recognition Page [√] Success	Number Recognition Page Displaying Number Recognition Page [√] Success
Learning Addition Page Displaying Addition Page [√] Success	Learning Addition Page Displaying Addition Page [√] Success	Learning Addition Page Displaying Addition Page [√] Success
Learn multiplication page Showing Learn multiplication page [√] Success	Learn multiplication page Showing Learn multiplication page [√] Success	Learn multiplication page Showing Learn multiplication page [√] Success
Recognizing Letters and Reading Pages Displaying Recognizing Letters and Reading Pages [√] Success	Recognizing Letters and Reading Pages Displaying Recognizing Letters and Reading Pages [√] Success	Recognizing Letters and Reading Pages Displaying Recognizing Letters and Reading Pages [√] Success
Alphabet Learning Page Displaying Alphabet Learning Page [√] Success	Alphabet Learning Page Displaying Alphabet Learning Page [√] Success	Alphabet Learning Page Displaying Alphabet Learning Page [√] Success
Vowel Recognition Page Displaying Vowel Recognition Page [√] Success	Vowel Recognition Page Displaying Vowel Recognition Page [√] Success	Vowel Recognition Page Displaying Vowel Recognition Page [√] Success
Learning to Read Page Displaying Learning to Read Page [√] Success	Learning to Read Page Displaying Learning to Read Page [√] Success	Learning to Read Page Displaying Learning to Read Page [√] Success
Get to Know Fruit Page Showing Get to Know Fruit Page [√] Success	Get to Know Fruit Page Showing Get to Know Fruit Page [√] Success	Get to Know Fruit Page Showing Get to Know Fruit Page [√] Success
Page Getting to Know Transportation Names Displaying Page Getting to Know Transportation Names [√] Success	Page Getting to Know Transportation Names Displaying Page Getting to Know Transportation Names [√] Success	Page Getting to Know Transportation Names Displaying Page Getting to Know Transportation Names [√] Success
About App Page Showing About App Page [√] Success	About App Page Showing About App Page [√] Success	About App Page Showing About App Page [√] Success

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Conclusion

The design of the Learning Application to Read and Count for Children Aged 4 - 6 Years Based on Android was created using Android Studio. The implementation of this designed application is expected to help parents in the learning process of children in order to improve understanding and knowledge because the application is designed interactively.

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