Android-Based Learning Application for Early Childhood Binayah Raudhatul Athfal Foundation

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A B S T R A C T

The binayah foundation is an educational foundation for early childhood that is characterized by Islam or raudhatul athfal. In organizing his education, Raudhatul Atfal instills the values of faith and piety to students in kindergarten (TK). As an educational foundation, Binayah Kindergarten requires innovation in presenting its teaching materials. This form of innovation is by utilizing technology that can create interesting and fun learning alternatives. This research designs and builds Android-based early childhood learning applications. The reason this application was built based on Android is because this application can provide knowledge in a different way that can be utilized by parents or kindergarten teachers by using smartphones android as a container for application installation. This application contains introductory material about hijaiyah, hadith, daily prayers, prayer readings, selected surahs, alphabets, numbers, and themes (professions, colors, animals, fruits and transportation).

Keywords:

Aplication, Android-based, Early-Childhood, Learning

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1. INTRODUCTION

Early childhood education is a form of education that is carried out as a coaching effort aimed at children from birth to 6 years old with an emphasis on laying the groundwork towards growth and developmental stages according to the age group that early childhood goes through.[1]

The binayah foundation is an educational foundation for early childhood (3-6 years old) characterized by Islam or raudhatul athfal. In organizing his education, Raudhatul Atfal instills the values of faith and piety to students in kindergarten (TK). As an educational foundation, Binayah Kindergarten requires innovation in presenting its teaching materials. This form of innovation is by utilizing technology that can create interesting and fun learning alternatives. One of the popular technologies currently used is the smartphone rather than the personal computer (CP).[2]

Therefore, the authors created an Android-based early childhood learning application that can be installed on smartphones with the Android operating system, because most parents who have high mobility provide android gadget facilities to their children starting from toddler age to drive away boredom and with the hope of parents to facilitate the learning process for children [3] and to distract so they can do their activities (which are often found in the field). Another reason is that the use of Android-based media is a step to improve the quality of education which is currently growing with the times.[4]

This application contains introductory material about hijaiyah, hadith, daily prayers, prayer readings, selected surahs, alphabets, numbers, and themes (professions, colors, animals, fruits and transportation). With the hope that this Android-based application can be an alternative learning media that students can use in the process of introducing some knowledge that they need to know and use as a complement to learning and provide opportunities for students to study material anywhere and anytime.[5]

Learning media is a tool that functions and can be used to convey learning messages. The existence of learning media also determines the success of a lesson.[5]

There have been several previous studies related to early childhood learning applications, including Interactive Animation of Introduction to Animals for Early Childhood Education,[6] Introduction Interactive Learning Application Animals in Early Childhood,[7] and Design of Educational Game Applications for Early Childhood Learning Using the Android-Based Linear Congruent Method (Lcm).[8]

2. LITERATURE REVIEW

2.1 Early Childhood

Early childhood is a group of children who are in a unique process of growth and development.[9] The period when the child is in the womb, from 0 to 6 years old, is the golden age or often called the Golden Age. During this golden age, the child's brain experiences the fastest development in the history of its life. During infancy in the womb until the age of 4 years is the most decisive period for children because during this period the child's brain is experiencing very rapid growth. For this reason, parents must pay more attention to children from birth to 6 years old. This attention can be given directly from parents or through early childhood education institutions.[10]

2.2 Early Childhood Education Programs

Kindergarten Education (TK) as stated in the Law of the Republic of Indonesia (RI) number 20 of 2003 article 28 paragraph 3 is Early Childhood Education (PAUD) on the formal education pathway which aims to help students develop various potentials both physically and physical education which includes morals and religious values, social, emotional, independence, cognitive, language, physical/motor and artistic to be ready to enter elementary school.[11]

Kindergarten is a form of early childhood education unit on the formal education pathway that organizes educational programs for children aged four to six years.

Early childhood education has an important role and determines the history of children's development in the future because this education is the basic foundation for forming their personality. The positive thing that can be obtained from early childhood education is that children get meaningful experiences because at this time children get active learning experiences.[12]

At an early age, there are several periods that an early childhood educator needs to know so that he can provide appropriate stimulation and stimulation to his students. These times are as follows. [13]

1. Sensitive Period
2. Egocentric Age
3. Imitating Time
4. Group Time
5. Exploration Time
6. Time of Defiance

2.3 Learning

Learning is an activity process of developing knowledge, skills or attitudes as a person's interaction with information and their environment so that in the learning process it is necessary to select, organize and convey information in an appropriate environment and through the interaction of the learner with his environment.[14]

2.4 Learning Media

Learning media are tools, methods and techniques used as intermediaries for communication between a teacher and students in order to make communication and interaction more effective between teachers and students in the process of teaching education in schools.[15]

2.5 Application

Applications are programs developed to meet user needs in carrying out certain jobs and are commonly used to perform various user-specific tasks. [16] According to the executive computer dictionary, the application has the meaning of solving a problem using one of the application data processing techniques which are usually driven by a desired or expected computation or expected data processing.

2.6 Android

Android is a Linux-based mobile device operating system that includes an operating system, middleware and applications. Android provides an open platform for developers to create their applications.[17] The 20th version of the Android operating system is Android 13. The Android 13 OS was first introduced on February 10, 2022. This latest Android sequence was released about 4 months after the stable version of Android 12 was released. Android 13 focuses on improving the features of Android 12L, increasing privacy, security, and optimizing the UI.

3. RESEARCH METHODOLOGY

3.1 Research Stages

Figure 1 below is the research stages of Android-based early childhood learning applications:

Figure 1. Stages of Research

The following is an explanation of the research stages above:

1. Problem Identification - At this stage the researcher determines the problems, solutions and innovations that can be given to the research object
2. Literature Study - At this stage the researcher searches for literature related to research that is similar to the title taken so that researchers get the right knowledge and guidelines in conducting research.
3. Data Collection - There are 2 data collection methods in this study, namely interviews and direct observation so that the research results in the form of android learning application products can be used or implemented on research objects (Binayah Raudhatul Athfal Foundation)
4. Prototype application - At this stage the researcher uses the prototype method to get a clear picture of the application being built so that researchers and the foundation can hold discussions to equalize understanding and perception of the android application to be built. (The design of this Android-based learning application has been published in a journal entitled "UI/UX Design of Early Childhood Learning Applications Using Figma".
5. Implementation - At this stage, the researcher focuses on coding for making Android-based early childhood learning applications according to the application prototype that has been made in the next stage.

3.2 Waterfall Method

The method used in research on android-based early childhood learning applications is the waterfall method. The waterfall method is a method that can be used for popular software development and is considered easy to implement. The waterfall method is also called the waterfall method to describe a systematic and sequential approach to software.[18] Figure 2 below is a picture of the waterfall method used in this study.

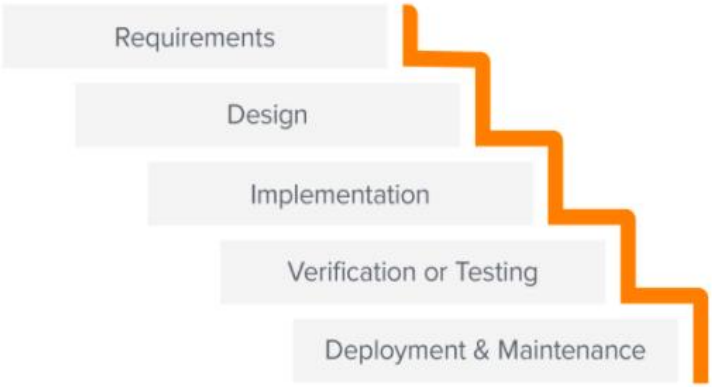

Figure 2. Waterfall Method

Waterfall method there are 5 stages, among others:

1. Requirements - At this stage what is done is to prepare and analyze the needs of Android-based early childhood learning applications that will be worked on. The information and insights obtained can be in the form of interviews, observations, and discussions.
2. Design - At this stage, the researcher designed the application design using the prototype method. So that the prototype can clearly describe what kind of application will be built so that researchers can equate perceptions and understanding regarding the application they want to work with the foundation (research object).
3. Implementation - At this stage, researchers focus on technical matters, where the previously built prototype will be translated into the Java programming language with Android Studio tools. (Creating program code from the prototype that was made before).
4. Verification or Testing - The fourth stage, the researcher tests the application that has been completed and ensures that the application is in accordance with the prototype made before.
5. Deployment and Maintenance - at this last stage, the application built is published to the research object. And for the maintenance stage has not been carried out in this study.

4. RESULT AND DISCUSSION

The Android-based Early Childhood learning application that was built has eight (8) menus of learning materials which are still basic in nature, namely introduction to hijaiyah, hadith, prayer readings, selected surahs, daily prayers, letters (alphabets), numbers and finally the theme menu. The following is an explanation of each menu in the Android-based early childhood learning application:

1. The Hijaiyah menu contains material on the introduction of hijaiyah letters.
2. The Hadith menu contains some commonly studied hadith material.
3. The Prayer Reading Menu contains prayer reading material.
4. The Selected Surahs menu contains several selected surahs that are commonly learned at binayah foundations.
5. The Daily Prayer Menu contains several prayers that are used before carrying out daily activities
6. Letter Menu (Alphabet) A-Z letter recognition material.
7. Number menu for the introduction of numbers 0-9.
8. Theme Menu, this menu contains 5 sub friends, namely the profession introduction menu, colors, animals, fruit and transportation.

3.1 System Design With UML

This study uses UML for system design. UML (Unified Modeling Language) is a tool for conducting object-oriented analysis and design, [19] and serves as a bridge in communicating several aspects of the system through a number of graphic elements that can be accommodated into diagrams. [20]

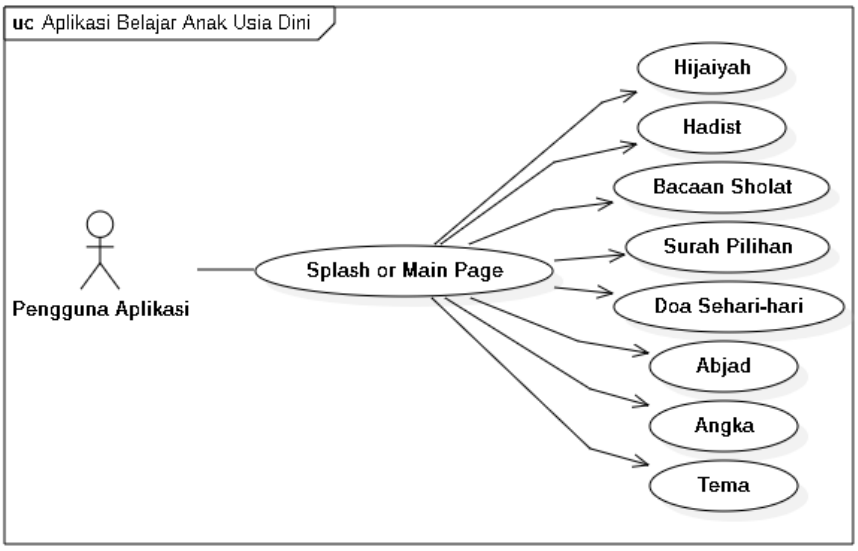

Figure 3. Usecase Diagram

Usecase diagrams are one of the UML diagrams used in making early childhood learning applications. Use case diagrams are diagrams that are used to describe the functionality of a system that will be created and can also represent the interaction of actors and systems or applications. [21] The perpetrators of application users in this use case diagram are early childhood but it does not rule out the possibility of children's parents or people who use or access learning applications. Splash screen or main page is the initial display that appears when the actor opens or accesses the application, after that page, the application menu page will appear.

3.2 Interface Application

Figure 4 is the display of the hijaiyah page, the display of the application menu and the display of the alphabet page. The image is a screen shot from a smartphone screen.

Figure 4. Hijaiyah Pages, Application Menu Pages and Alphabetical Pages

The early childhood learning application has 8 (eight) menus. For hijaiyah menus, alphabets, numbers and theme sub menus (professions, colors, animals, fruits and transportation), the learning material is presented with audio.

When one of the images is clicked or selected, the audio (pronunciation or naming) associated with the image will be heard. For the hadith menu, prayer readings, selected surahs and daily prayers. The learning material will be presented with a video. The purpose of using audio dan video in the application is to help children in the learning process**.**

5. CONCLUSION

Based on the results and discussion of the Android-Based Early Childhood Learning Application that has been described, the following conclusions are obtained:

1. This application can be used as an alternative learning media that can be used by early childhood (children's age range from 4 to 6 years).
2. Android-based early childhood learning applications are built and contain material according to needs and requests so that the application will be implemented.

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