

## Developing Educational Game Application Toward Students' Alphabet Understanding for Kindergarten Students Through Android Application

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### ABSTRACT

Given the dearth of resources for teaching and learning about alphabet comprehension, the goal of this project was to create instructional gaming applications for kindergarten children using Android applications. Research and development (R&D) was done for this project. Students from RA Darul Hidayah in Kangean Sumenep, East Java, served as the study's subjects. Research procedures included developing a media product, getting expert validation, testing the product, and having a teacher evaluate it. Steps for testing the product were twice. Fifteen students participated in the first tryout, while sixteen students participated in the second. Expert validation of the creation of educational game applications led to the conclusion that testing was highly appropriate. Based on the findings of two tests, it was determined that this product was extremely appropriate for implementation. The first test produced a total result of 665 with an 88% percentage, classifying it as very proper, and the second test produced 750 with a 93% percentage, also classifying it as very proper.

### 1. Introduction

Technology is pervasive these days. It provides everything related to the needs of society. We can choose from a range of lines based on our needs. Since technology gives us access to information about people's lives, including jobs, news, politics, social and economic issues, and knowledge that has a good impact on education, it is crucial to modern, globalized living. Education has the power to improve people and advance mental and physical health (Sujana, I. W. C, 2019). Because technology makes information simpler to find and acquire, especially for students, it can improve education (Hapsari, 2023).

Multimedia features and information such as animation, audio, graphics, photographs, music, sound, and video are featured everywhere computer technology has progressed to create these days. We can independently create interactive learning processes with the use of multimedia. To play an interesting game for their students and look for successful learning tactics, educators can produce well-designed interactive learning materials from Android that are easy to utilize on a laptop, computer, smartphone, or other mobile device (Hapsari, 2023). Because of this, students' preferences for learning from kindergarten through high school can be changed by technology. Things that are simple, modern, and timeless catch pupils' attention more. Almost everyone uses technology as an additional learning technique, especially in kindergarten, since youngsters enjoy playing games on their phones and watching movies on YouTube (Hapsari, 2023). This suggests that technology is a major part of elementary, junior high, senior high, and university education in addition to kindergarten.

Kangean's RA Darul Hidayah kindergarten has good alumni and good quality; however, its alphabetic level is lacking. When the teacher asks the students to guess a letter from an example, for example, they can sing and know the alphabet from A to Z, but they can't predict or answer. One of the reasons is that, even if their parents taught them at home, the fact that writing and alphabet guessing played such a large part in their parents' teaching methods meant that the kids weren't greatly affected in school. It is uncommon for teachers to use a playful and interesting teaching style in the classroom; instead, they focus solely on strengthening and perfecting the alphabetic letters. Due to these problems, researchers decided to deploy an Android application to assist RA Darul Hidayah pupils in learning the alphabet. Remember how important it is, after all, that young children learn the alphabet and recognize the starting letters? (Rakimahwati, 2021).

Furthermore, specialists felt that since children prefer to play as they study, it was essential to use the new techniques and learning resources. However, the 2013 curriculum states that writing and reading are literacy skills that need to be developed; thus, children must be able to identify them as well as write and read (Borre, 2019). The National Education System's Article 1 Paragraph 14 states, "An early childhood education is an effort aimed at fostering children from birth to the age of six years carried out by providing educational stimuli to help physical and spiritual growth and development." This statement is further supported by paragraph 14.

Since learning the alphabet is the first major skill that students need to acquire in order to perform better in later lessons, it is essential that the introduction and comprehension of the alphabet occur early in the educational process. To the extent that a teacher is able, the introduction, or comprehension of the alphabet, can be created on a computer or mobile device. Since children in the age range of 4 to 6 prefer to play and strike before listening to the teacher explain the alphabet in class, it is the responsibility of the teacher to use creativity in choosing an engaging learning method for the class (Hapsari, 2023). As a result, it can be challenging for a teacher to try and modify the learning method using well-known, enjoyable, and engaging media.

The subject matter that will be taught, the teacher's credentials, and the students' personalities are other considerations (Mustaqim, 2017). In order to foster students'

interest in skill and provide them with opportunities to be active, creative, and independent, the educational process must also be engaging, joyful, interactive, and demanding (Suherman, 2017). The influence of learning style is thus dependent on the accuracy of media selection because a successful learning process depends on the method and approach used, including whether or not students will receive media in class and whether or not they will use it regularly both at home and at school. Teachers can use Approach as a source of tried-and-true techniques to adapt to their own needs (Richards, 2001). Thus, cross-alphabet will be the study's medium.

Because it will be easier to understand and, in essence, because Android allows students to move around freely without a cable (Oktavia, 2021), the educational game application, which will be made using Construct 2, an application program (2024) applying the Unified Modeling Language (UML) technique (Marliana I., 2023), will help students at RA Darul Hidayah better comprehend the alphabet. Additionally, playing the alphabet on a computer or mobile device with entertaining and adorable graphics is a great way for kids to learn the alphabet and boosts their IQ.

The aforementioned statement states that the study's goals are to give children interesting learning resources so they can learn the alphabet letter by letter and put each letter in a word during regular activities. The basic prerequisite of introducing and understanding the alphabet can also be met. Therefore, the purpose of this study is to investigate Android learning materials that aid in the presentation of the alphabet to pupils. It is employed to assess the quality of the media that is created. The findings of this study should aid in the introduction and comprehension of the alphabet for young learners by parents, educators, and students.

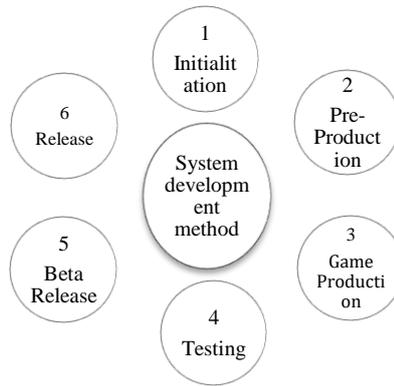
Significant findings were made by (Hapsari, 2023) regarding the use of android-based learning resources to teach letters and numbers. In the earlier research, which was conducted by (Ayeni, 2020), young children in nursery school, ages three to five, were allowed to spend a few minutes interacting with the mobile application (Rakimahwati, 2021), which led to the kids' reading abilities being developed via educational games based on Android and were deemed legitimate, useful, and successful. Researchers now have a new area of inquiry to explore when creating educational game applications for kindergarten students' alphabet comprehension in Indonesian-English using the educational game application, since the experts mentioned above have only created Android-based educational games in Indonesian, not English.

The purpose of this research and development technique was to create an Android application that would serve as a game-based learning tool for kindergarten kids' alphabet comprehension.

## **2. Methods**

In this study, the research and development (R&D) technique is applied. Research and development, according to (Sugiyono, 2016), is the process of developing a product and using research to determine its effectiveness. Construct 2, a software application program, is utilized in the production of this study (2024). It is compatible with smartphones and

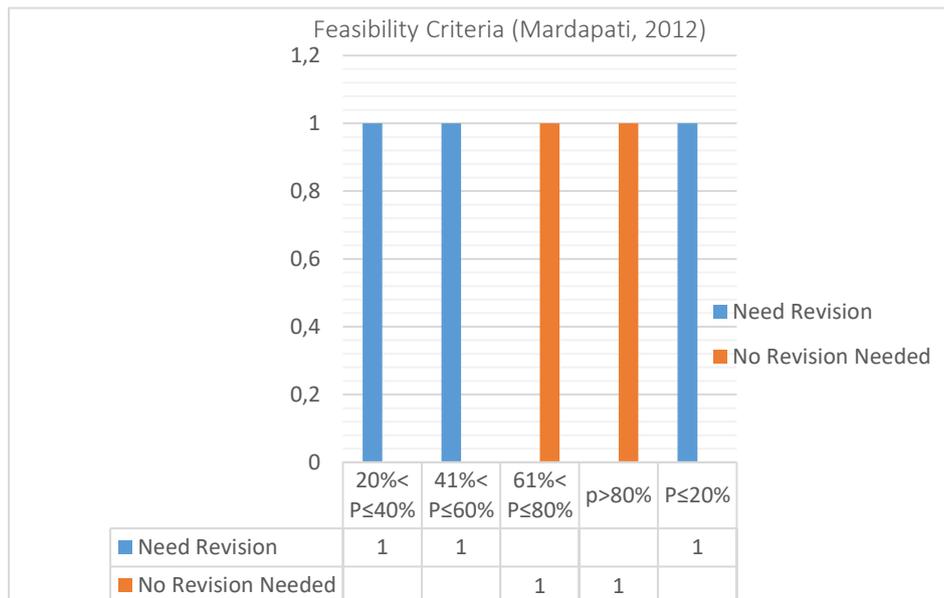
other mobile devices. Unified Modeling Language (UML) is used in this study's system program method (Marliana I., 2023). This study's system development technique also makes use of the Game Development Life Cycle (GDLC), which consists of the following six steps: *initialization, pre-production, game production, testing, beta release, and release*.



**Figure 1.** System development stage (Wahyu, 2022).

A questionnaire and documentation are the instruments or data collection tools used in this study. The purpose of the questionnaire is to gather feedback on the goods that are being developed or manufactured from teachers, students, and validators. The Likert scale, which has a range of 1 to 5, was utilized in both quantitative and qualitative analysis to determine the viability of the instructional gaming application.

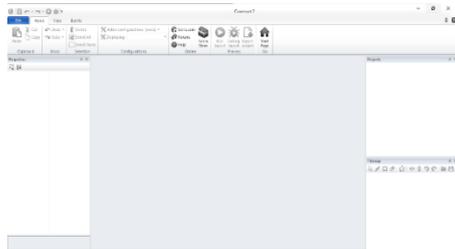
**Table 1**



### 3. Result

The study's output was an instructional game for kindergarten students that used an Android platform and six steps—initialization, pre-production, game production, testing, beta release, and release—to help them understand the alphabet in Indonesian-English. Responses from teachers, students, media professionals, and content specialists verified

the product. Following receipt of the improvement ideas, RA Darul Hidayah conducted a product test. It was created to help kindergarten students understand the alphabet in English and Indonesian. The outcomes of the product development are described in the following manner.



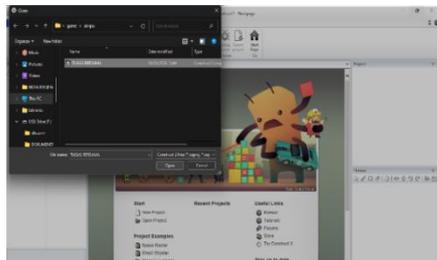
**Figure 1.** First screen to open the application



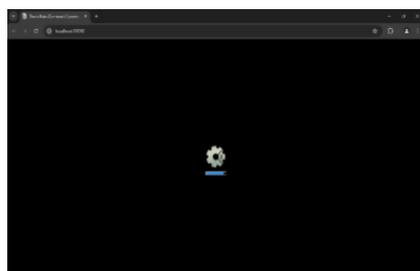
**Figure 2.** Click open project



**Figure 3.** Click Start page go



**Figure 4.** Players choose the shared assignment file that was saved in the laptop



**Figure 5.** Application will be opened (run one second)



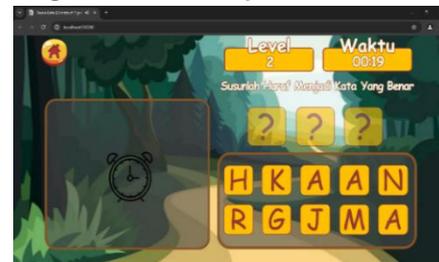
**Figure 6.** Players click run layout



**Figure 7.** Players go to choose menu (learn or play) that will be played



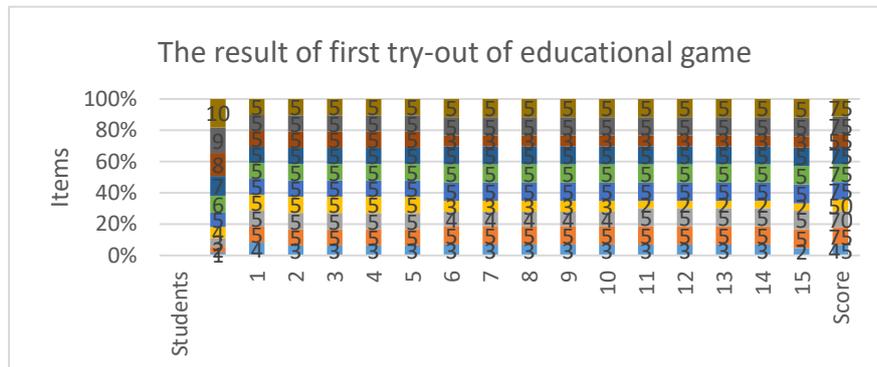
**Figure 8.** Learning screen



**Figure 9.** Game screen

**a) Result of First Try-out**

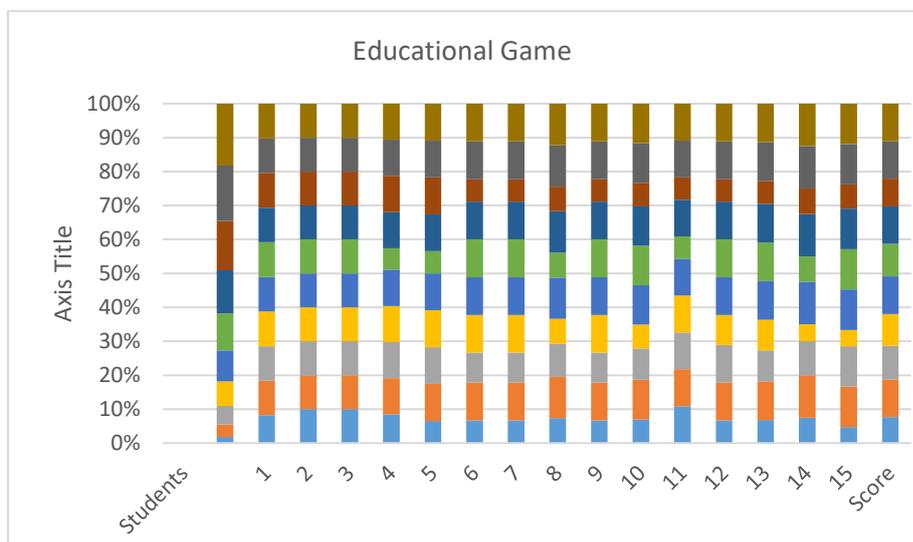
**Table 2**



The result of the first try-out showed that educational games was very proper by the percentage of 88% from the form in Chapter III. The result of the first try-out of crossing the alphabet showed that in *item 1*, one student chose very good, twelve students chose good, and one student chose fair. *Item 2*: All of the students chose excellent. *Item 3*: Five students chose excellent, five students chose very good, and five students chose good. *Item 4*: Five students chose excellent, five students chose good, and five students chose fair. *Item 5*: All of the students chose excellent. *Item 6*: All of the students chose excellent. *Item 7*: All of the students chose excellent. *Item 8*: Five students chose excellent, and ten students chose good. *Item 9*: All of the students chose excellent. *Item 10*: All of the students chose excellent.

**b) Result of Second Try-out**

**Tabel 3**



The result of the second try-out showed that educational games was very proper by the percentage of 75% from the form in Chapter III. The result of the first try-out of

crossing the alphabet showed that in *item 1*, four students chose excellent, ten students chose very good, and two students chose good. *Item 2*: All of the students chose excellent. *Item 3*: Eight students chose excellent, five students chose very good, and three students chose good. *Item 4*: seven students chose excellent, seven students chose very good, and two students chose good. *Item 5*: All of the students chose excellent. *Item 6*: All of the students chose excellent. *Item 7*: All of the students chose excellent. *Item 8*: five students chose excellent, eight students chose very good, and three students chose good. *Item 9*: All of the students chose excellent. *Item 10*: All of the students chose excellent.

### c) Final Product

The educational game product was created with RA Darul Hidayah's alphabet comprehension in mind. The method and procedures outlined in Chapters III and IV were used in the development of the instructional of the educational game. To achieve the right product and revision references, the stages and development process were verified by professionals, teachers, and students. Aside from that, the substance of the game was valid because it was based on the alphabet lesson, and the validation and research results were appropriate for the development of the students.

The Start page, which is where you join the game, is the primary substance of this one. Learn entails picking up a term in both English and Indonesian. Play is the game of word scrambling. To keep the student interested, the content is designed with a variety of images, both capital and lowercase letters, and instances that are relevant to the alphabet. Every element of this medium has the sound of an audio file that serves as a guide to provide the answer to the query. Positive incentives are also provided by this medium, such as starting at 3 for the correct response, moving on to the next section of the game, and having to redo it if the answer is incorrect. To keep the pupil interested, this medium's menu features a wobbly word with varying directions set against a backdrop of a jungle. The final step is for students to learn and perform the alphabet in both Indonesian and English. The researcher provides the alphabet in Indonesian as well as the English pronunciation of each letter as well as an Indonesian example.

## 4. Discussion

The product research and development were conducted after a preliminary planning phase that included paperwork and a questionnaire. It was well known that at RA Darul Hidayah, we exclusively used textbooks and direct techniques to teach the alphabet in Indonesian-English never using Android applications. Thus, the application program Construct 2 was used to develop a educational game as the solution (Yulivantina Vicky, 2019). Applying the Unified Modeling Language (UML) technique (Irawan et al., 2024), and Game Development Life Cycle (GDLC) was also employed in this study's system development methodology (Ramadan & Widayani, 2013). It was developed kindergarten pupils better comprehend the alphabet in Indonesian-English with the questionnaire and the score which were the students got in the test. (see appendix 7-8 and 10) The educational game that was created was verified by media experts, subject experts, and instructors' and students' feedback prior to testing

Following expert validation (media experts scored 84% and 100%, content experts scored 96%), it was determined that the educational game application was well suited for testing. Based on the findings of two tests, it was determined that this product was extremely appropriate for implementation. The first test produced a total result of 665 with an 88% percentage, classifying it as very proper, and the second test produced 750 with a 93% percentage, also classifying it as very proper. It demonstrated how the educational gaming applications were created to help kindergarten students understand the alphabet in both Indonesian and English, which was said to be a very appropriate implementation.

## 5. Conclusion

Given the dearth of resources for teaching and learning about alphabet comprehension, the goal of this project is to create instructional gaming applications for kindergarten children using Android applications. Following student testing of the educational gaming applications, it was built so that kindergarten students could better understand the Indonesian-English alphabet, which was said to be extremely appropriate to apply.

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