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Developing "Transportastic" Learning Application to Enhance Vocabulary Mastery for Young Learners

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A B S T R A C T

Speakers of different languages are taught English as a Foreign Language (EFL) all over the world, including in Indonesia. English is taught to children from a young age. Today's technology is thought to help humans do tasks quickly and effectively because of how quickly it is developing. This research aims to know how is Transportastic application developed for young learners. This research used a research and development (R&D) design. The research procedures are: (1) the researcher examined the requirement for creating educational resources for kindergarten students, (2) the researcher gathered files that would need to be added to the program, including images and audio, (3) the Transportastic application was designed based on the observation found in the syllabus and the materials gathered, (4) the application was validated in front of expert validators, (5) the researcher finalized changes or revisions to the Transportastic application based on the expert validator's validation checklist result, (6) the completed product, the Transportastic application, was designed and developed according to the revisions from the experts. This research shows that based on validation from expert, it was indicated that Transportastic application has been well designed for kindergarten level to learn vocabulary.

Introduction

Speakers of different languages are taught English as a Foreign Language (EFL) all over the world, including in Indonesia. EFL is a comprehensive educational approach that helps students improve their speaking, listening, reading, and writing skills. Students who are proficient in these language abilities are better able to comprehend and accomplish their objectives (Stankova et al., 2022). English is taught to children from a young age. Children typically learn about basic concepts in kindergarten school, such as colours, animals, the alphabet, and so forth (Sari et al., 2020). According to (Oktaviana, 2017), children begin by performing tasks in a social setting, where language and other people can assist them in a variety of ways. Eventually, they begin to rely less on other people and more in their own initiative and critical thinking.

Piaget (1996) asserts that children are perceived as continuously engaging with their surroundings and resolving issues that arise from their surroundings. Moreover, the steady learning of memory, comprehension, and problem-solving techniques is a component of cognitive growth (Oktaviana, 2017). The children actively attempt to create sense as well (Babakr et al., 2019).

Today's technology is thought to help humans do tasks quickly and effectively because of how quickly it is developing. Worldwide, the proportion of children using gadgets is rising. A study by Nurdiantami & Agil (2020) found that one in three kids can use a smartphone before they can speak. Globally, children as young as two years old who attend preschool spend an average of 1.5 hours a day on screens; by the time they are three and a half years old, that number roses to two hours. This is a widespread occurrence, particularly in underdeveloped nations. In order to assess the impact of technology on prechoolers' development, researchers examined this subject (Korinek et al., 2021).

According to research by Konca & Hakyemez-Paul (2021), digital technology was found to have ingrained itself into kindergarten students' daily lived and was seen to be beneficial to the educational activities of the kindergarten. Furthermore, according to Zomer & Kay (2018), children's use of technology enhanced their language skills, which is supported by earlier study. Children benefit greatly from technology. In addition, Westhuizen & Hannaway (2021) said that teachers can use digital games to help their students learn languages by utilizing technology.

According to earlier studies, technology use can foster children's creativity, help then learn foreign language (by listening to sounds and seeing pictures), improve their motor and cognitive skills, increase their enjoyment of play, educate young ones, and foster a competitive spirit. By offering dynamic platforms for discovery and expression, technology integration into children's learning environment has greatly boosted their creativity. With the help of digital tools and applications, youngsters can now pursue a wide range of artistic endeavour and create, innovate, and experiment in ways that were before unthinkable. Children can learn foreign languages in an entertaining way with the use of technology, which is a great tool (Mashrah, 2017).

When teaching English. Teachers must make extensive use of technology. It is quite beneficial to use technology as media in the classroom. Media technology can also improve the way that pupils study. This implies that educators must be proficient in software that may be utilized as a tool for media creation (Saputra et al., 2020). Utilizing technology as a teaching tool has an effect on students' performance in terms of their ability to learn English and become adept technology users. A teacher has the power to inspire pupils to reach greater heights. According to Muhammad & Schneider (2022), technology can boost students' motivation and result in better academic performance. Furthermore, Campbell & Jane (2012) study came to the conclusion that motivation can contribute to a rise in students' motivation.

The advantage of utilizing technology as a teaching medium is that it is an effective and vital teaching tool that can improve instruction and student learning. Technology can serve as a bridge between teaching and learning when handled properly. Teachers can develop their creative thinking skills with the help of technology. Additionally, children can enjoy themselves while learning with technology. For example, when students use an application that combines educational content with entertaining games, they will not become bored (Saputra et al., 2021). Study by Annisa et al., (2021) led to the conclusion that the application was made with young learners' vocabulary acquisition of English in mind. According to research by Mamani-Calapuja et al., (2023) the application was created to enhance kindergarteners' vocabulary acquisition. According to research by Lee et al., (2015), the application was created to improve children' four English language proficiency areas (speaking, listening, reading, and writing). Furthermore, a study by Saputra et al., (2021) found that game-based English instruction benefits young learners since it allows them to enjoy learning the language. According to research by Saputra et al., (2020), the application was made to introduce young learners to concepts like numbers and alphabet.

However, according to Masruddin (2020), there are drawbacks to technology for both teachers and students. The use of technology in the classroom might provide certain obstacles for the instructor, such as the need to put in more effort or longer hours to produce the curriculum using technology than they would if it were published in a book. When using an application as a teaching tool, educator must create one that meets specific requirements in order to provide students with a high-quality learning experience. The use of technology by children may have drawbacks, such as the development of gadget dependence.

Learning materials are the aspect of the kindergarten syllabus that are being observed, based on the study of the need of analysis. The syllabus revealed that the topics covered in the transportation section included naming different modes of transportation, examining images of various modes of transportation, and setting various modes of transportation. As a result, the researcher made the decision to create the vocabulary-learning application called "Transportastic", which contains information about transportation. The application included a number of transportation-related vocabulary. Because the content was created by modifying it in accordance with the syllabus, it is appropriate for kindergarten.

An application that contains content concerning transportation is called "Transportastic". The application was created with kindergarten in mind. The software has four primary features: names of transportation, pronunciation practice, entertaining quizzes, and a game. Kindergarten students are the research topic, which is characterized as a young learner. The vocabulary employed in this study is made up of certain transportation-related terms that served as the basis for the Transportastic application.

The objective of this research is to know how is Transportastic application developed for young learners. This research contributes to expand knowledge regarding Research and Development, especially making an application. The research's finding can be consulted while teaching vocabulary to young learners, particularly those in kindergarten. The result of this research can make it easier for teachers to teach transportation to younger students, particularly those in kindergarten. This serves as supplementary data for other researchers wishing to go deeper into relevant topic.

Research Method

This research used a research and development (R&D) design. Ten steps were included in R&D research, according to Borg and Gall (1983). These steps included identifying the potential and problem, gathering data, designing the product, validating the design, revising the design, testing the product testing it again, revising the product, and massively developing the product. Borg and Gall (1983) noted that the 10 procedures may be restricted, nevertheless, if certain procedures could not be carried out by the researcher for specific reasons. The researcher consequently restricted the number of procedures in this research to six steps: potential and problem, collecting information, product design, design validation, design revision, and final product.

Descriptive analysis and descriptive statistic were used in this research' data analysis procedure. While the average from the validation checklist result was analyzed using descriptive statistic, the process of building the Transportastic application was described using descriptive analysis. Expertise was used to validate. The validation served as a benchmark to determine whether further improvements to the product were necessary or not. Experts from UIBU's English Department lecturer and IT specialist validated the product. In order to determine if the application was ready for usage or not, an expert validation was carried out. The following was an overview of the validation criteria.

Table 1. Validity Score and Criteria

Score	Criteria
2,36-3,00	Valid
1,68-2,35	Valid Enough
1,00-1,67	Not Valid

Result and Discussion

In this part consists of the development process based on adapting Borg and Gall (1983) model. There are five process conducted to this research, such as Potential and Problem, Collecting Information, Product Design, Design Validation, and Design Revision.

a. Potential and Problem

In this stage, the step was done by observing the syllabus of kindergarten. According to the syllabus, the criteria of the material about transportation included learning about name of transportations, looking at transportation pictures, and mentioning name of transportations. Therefore, in the Transportastic application the researcher made some menu that related to the syllabus content such as Transportations menu which consists of transportation pictures and there are sounds of a speaker that pronounced the name of the transportations. Then there is Let's Practice menu that related to mentioning name of transportations, so students can learn to pronounce name of transportations. In

addition, the researcher also made Quiz menu for students to learn writing name of transportations. Therefore, the
application is ready to be used by kindergarten students because it was already being adjusted to the syllabus.

b. Collecting Information
The researcher developed an application called Transportastic. Before developing the application, the researcher collected some information in the form of materials that will be used to develop the application. The materials were about transportation. The materials were displayed in several forms, such as pictures, sound, and text. For the pictures there are 20 pictures of transportation displayed in the application. The researcher collected the pictures from Google. For the sounds, there are approximately more than 40 sounds used in the application. The researcher collected those sounds from YouTube. For the text, the research made it by herself, for example text in Quiz menu and other menu. Moreover, the 20 pictures were also combined with 40 sounds, which consist of the pronunciation of each name of transportation. The pronunciation is in bilingual (English and Indonesian). For the Indonesian pronunciation, it consists of the meaning of each transportations to make students easily understand. The application is android-based and it can be accessed both online and offline. The researcher used MIT App Inventor for designing and developing the application. The researcher made the application by herself.

c. Product Design
In this stage, the researcher has made application namely Transportastic which consists material about transportation for kindergarten students. The application aims to improve English vocabulary. The researcher made four types of content in the application, those are name of transportations including the pictures and sounds, pronunciation practice, quizzes, and game. The display of the application can be seen as follows:

Figure 1. Splash Screen of Transportastic Application

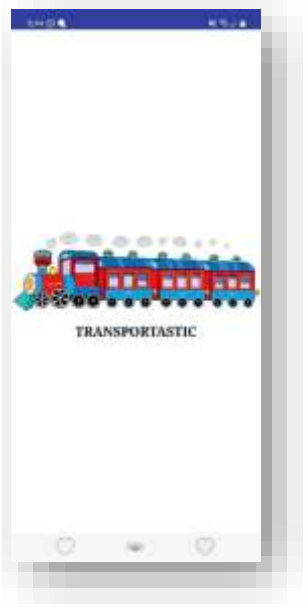
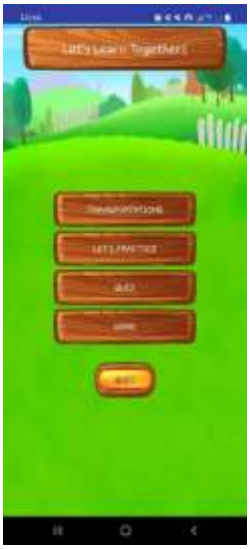


Figure 2. Main Menu

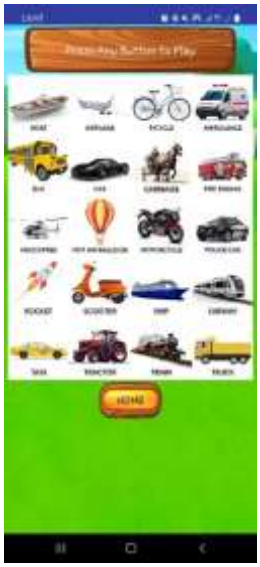


There are four menu in the application, such as Transportations, Let's Practice, Quiz, and Game. In this section will be explained more regarding the development, the process, and how does each menu work.

1) Transportations

In this menu consists of 20 pictures of transportation. In each pictures is written the name of the transportation. Moreover, there are sounds inserted to each pictures. The sounds consists of pronunciation of the name of each transportations and it is bilingual (English and Indonesian). For the Indonesian, it is the meaning of the transportations. When one of pictures is clicked or touched, the sound will appear. For example, if you click or touch "airplane" picture, then the sound will appear as "*airplane*" and will be followed by Indonesian meaning "*pesawat terbang*". In this menu, children can improve their vocabulary because there are many transportation names provided in the menu. They can read the name of transportation written on each pictures and they can listen to the pronunciation. The display of Transportation menu can be seen as follows:

Figure 3. Transportations Menu

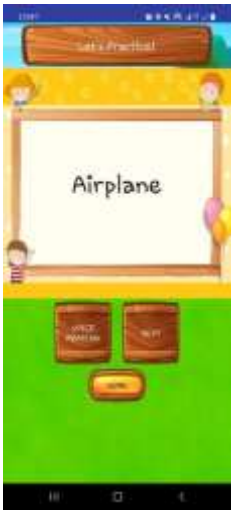


2) Let's Practice

In this menu consists of 20 words based on the name of transportations on Name of Transportations menu. This menu is for practicing pronunciation. How does this menu work is,

when there is a word appear, for example “bicycle”, then children can click on the “Voice Reading” button and it will record their voice by enabling the Google speech (usually it will appear permission to activate Google speech on the phone), so in this menu they need internet connection. After that, they can speak or pronounce the word appeared on the screen. If their pronunciation is correct, the application will react as “Correct”, but if their pronunciation is wrong, the application will react as, for example “Wrong, it is bicycle. You can try again”. There is a “Next” button and it is for moving to the next word. In this menu when children pronounced it wrongly, the application will give the correct way on how they should pronounce it correctly. The display of Let’s Practice menu can be seen as follows:

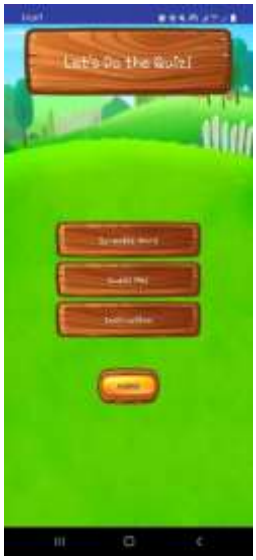
Figure 4. Let’s Practice Menu

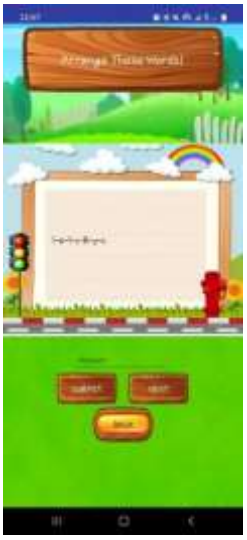


3) Quiz

In this menu consists of several questions about transportation. This menu is divided into three parts, such as Scramble Word, Guess Me!, and Instruction. For the Scramble Word, it consists of questions about material, for example the questions is “i-e-l-c-B-y-c” so children need to arrange this word into a correct word. How do children answer the questions is, they can type their answer on the “Answer” section that has already provided in the menu. Then when children typed the answer, they need to click “Submit” button in order to submit the answer. If the answer is correct, then a text will appear as “Correct!” If the answer is wrong, then a text will appear as “Wrong. The correct answer is Bicycle” therefore, when children answer it wrongly, the correction will appear along with the “Wrong” text. The display of Quiz and Scramble Word menu can be seen as follows:

Figure 5. Quiz and Scramble Word Menu





4) Game

In this menu consists of a game about alien shooting. This game is for fun because kindergarten students usually like to play while learning. Therefore, this game was made for ice breaking for the users. The researcher chose a rocket to be put on the game because the material is about transportation and in Transportaions menu also already displayed a rocket picture. Therefore, the researcher made the game to be related to the material being learned. How this game work is, children can point the rocket to the alien spaceship, then they can click the rocket and a bullet will appear to shoot the alien. Every successful shoot will have a score of 2, so children can shoot as many as they want. If they want to play again from the start, they can click the "Reset" button, and the score will be starting again from 0. The display of Game menu can be seen as follows:

Figure 6. Game Menu

d. Design Validation

In this stage consists of the result of validation checklist that was done by expert validator. There were two expert validators for validating the application, there were media expert and IT expert. Based on the result of validation checklist from the teaching media expert, the average score of the validity is 2,6 which means that the

application is valid. Based on the result of validation checklist from the teaching media expert, the average score of the validity is 2,9 which means that the application is valid.

e. Design Revision
In this stage the researcher did revision based on the comments from teaching media expert. The revision was regarding the Guess Me menu. The sentences in the menu need to be simplified in order to make it easily be understood by kindergarten students

f. Final Product
According to the result of the product in this research, the product was Transportastic application consists of material about transportation. The application was made to learn vocabulary for young learners, especially for kindergarten level. The programming system used to design the application was MIT App Inventor. There are four contents in the application, such as name of transportations, pronunciation practice, quizzes, and game. In addition, to install and operate the application, it requires an android device because Transportastic application is android-based. After installing the application the users can see a splash screen, then it will automatically leads them to the main screen.

Moreover, the researcher compared this research with several previous studies in order to discuss the strength and weakness between this research and previous studies. First, a study conducted by Saputra et al. (2020) has a result that the application designed for introducing material, such as numbers and alphabet to children. The application was developed by using Construct 2 with Multimedia Development Life Cycle system. In the term of design and developing system, on the previous study the system was harder because it needed special IT expert to maintain the application and the system. While on the current research the system was easier. The researcher used MIT App Inventor to design and develop Transportastic application. It is a free website and easy to be used, so it does not need a special IT expert to maintain the system and the application. The strength of the current research is there is a menu consists of practicing pronunciation in Transportastic application, while on the previous study there was no such menu. However, the weakness of this research is in the application design system, there were no tools to make a login screen in order to save learning progress, especially when the user got score in Quiz menu. In this current research there were bilingual sounds, for example in Transportations menu, there were sounds of English pronunciation of the name of transportations and the meaning in Indonesian, while on the previous study only consists of Indonesian language.

Second, a research conducted by Saputra et al. (2021) has result that game-based English learning for young learners is helpful for students. The similarity between the previous research and current research is both used R&D as the method. Both research also focused on developing and designing application for learning English for young learners or children. Based on the previous research the system was not specified, the previous researcher did not mention the programming system used for designing the application, while on the current research the system used for designing the Transportastic application was MIT App Inventor. The current research has a strength in the term of material. In the current research there is introductory material about transportation, such as pictures of transportations, name of transportations, and bilingual sounds (English and Indonesian) in order to make children understand the material being learned. While on the previous research, there was no introduction about the material and it only consists of game. Therefore, the current research has more advantage because in Transportastic application, it is not only consists about material, but also consists of pronunciation practice, quizzes, and game.

Third, a research conducted by Lee et al. (2015) has result that the application was designed to increase the four English skills (speaking, listening, reading, and writing) for children. OSMD and virtual reality were used to design the application on the previous research. While on the current research MIT App Inventor was used for designing and developing Transportastic application. The similarity between previous research and current research is both discussed about designing and developing application of English learning for young learners or children. The method used by both research is R&D. The strength of current research in the term of design system, it was easier than OSMD system because in the current research used MIT App Inventor

to design the application. MIT App Inventor is a free website for designing and developing, so it has no cost in making Transportastic application. While on the previous research, OSMD and virtual reality were complicated system to make an application and it costs a lot of money compared to MIT App Inventor. However, the current research has weakness compared to the previous research in the term of content. On the previous research was provided content about conversation and songs, while on the current research there were no tools in MIT App Inventor to design such content.

Fourth, a research conducted by Mamani-Calapuja et al. (2023) has result that the application was designed to improve learning about vocabulary for children in kindergarten. The similarity between the previous study and current study is both used R&D as the method. The difference between previous research and current research is, on the previous research AR system was used for designing the application, while on the current research MIT App Inventor was used for designing Transportastic application. On the previous research the material focused on vocabulary about classroom objects, while on the current research the material focused on transportation. On the previous research the application was made to improve learning vocabulary for children, while on the current research only focus to make Transportastic to learn vocabulary for young learners. The strength of current research compared to previous research is, Transportastic application is easier to operate, while on the previous study the application was quite complicated for children because on the main screen children need to register by creating an e-mail before starting to explore the application. However, there was a weakness of Transportastic application. In Transportastic application the material was only focus on about transportation, while on the previous research the material were various, such as animal, family, clothing, and so on.

Lastly, a research conducted by Annisa et al. (2021) has result that the application was designed for learning English vocabulary. The similarity between previous research and current research is both used R&D method. Both research discussed about designing and developing application for learning English vocabulary for young learners. Based on the previous research was not specified the system used for designing the application, while on the current research MIT App Inventor was used for designing and developing Transportastic application. The strength of Transportastic application is it is easier to be used by children because they only need an android device to install the application, while on the previous research students need a laptop device with Windows 10 Pro system to install the application. However, the current research has a weakness in the form of application content. In Transportastic application the material was only about transportation, while on the previous research there were variety of material being displayed, such as body parts, food, beverage, and so on.

Conclusion

The researcher conducted this research to design and develop Transportastic application. The researcher conducted observation based on the syllabus in order to analyze the material needed to be put on the application. The application was made to learn vocabulary for young learners, especially for kindergarten level. The vocabulary material was about transportations. There are four main content in Transportastic application, such as name of transportations, pronunciation practice, quizzes, and game. The application is android-based.

There were six stages conducted for designing and developing the application, such as potential and problem, collecting information, product design, design validation, design revision, and final product. The main revision for the application was from the teaching media expert. The revision was on Guess Me menu, the questions needed to be simplified in order to make kindergarten students easier to understand the questions. The validation score result from the teaching media expert was 2,60 which means that the application is valid regarding learning design aspect. The validation score result from the IT expert was 2,90 which means that the application is valid regarding software and visual communication aspects. Therefore, the result of the validation from the experts indicated that Transportastic application has been well designed for kindergarten level to learn vocabulary.

Based on the result of the research, the researcher gave some suggestions such as for kindergarten teachers, Transportastic application can be used as learning media, especially regarding vocabulary for transportation material. For kindergarten students, Transportastic application can be used for learning vocabulary, especially transportation material with parental guide. For further researcher, this research can be used as a reference for conducting similar topic of research, which is about developing English learning application for young learners. The further researcher can explore more theories and data source in designing and developing material. In addition, further researcher can implement application to school.

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