Development of Educational Games as Learning Media for English Learning for Primary Students

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Abstract

Industrial era 4.0 brought many changes and innovations in the educational field. Technology is one of the things that is highly developed in the 4.0 era, which has a significant effect on the teaching and learning process. Teachers are required to be able to take advantage of this technological development to be involved in the learning process. As well as in teaching English to the young learner in this 21st century learning, the teacher must be able to create a fun learning environment through the help of learning media, which games. This study aims to develop an educational game as a learning media for English learning for primary students as well as the validity of the product. The Design and Development (D&D) and ADDIE model, which consist of five stages, are chosen in this study. The validation from the expert uses three experts, and for the user evaluation, this study uses five students as the respondent. The result showed that in expert judgment validation, the media got 89%, and for the user evaluation, the media got 90%. Based on the result, the educational game for 6th-grade primary school students is feasible to be used in English learning as learning media.

Keywords: education, technology, English, learning media, game

INTRODUCTION

The rapid development of technology in the industrial era 4.0 began to enter human life in various fields of life. Human interaction and activities that used to take long times to do, like day or month, change into a minute or hour. Especially with the current technological sophistication that makes it easier for humans to do various jobs (Gunadi et al., 2022). Many industries, business, and even educational fields benefit from the advanced technology. Education means an effort to develop the abilities one has in order to prepare the next generation to be able to have abilities needed in the future (Zuhdi et al., 2021). As an important aspect in human life, education starting get many innovations. Most of school began to used technology in teaching and learning process.

Furthermore in 21st century learning which is emphasized in four skills (communication, critical-thinking, collaboration, and creativity). In addition, the learning in 21st century is oriented to students-centered (Juanda et al., 2021). That means the students is expected to be able to learn more independently but still under the guidance of a teacher (Muhali, 2019). Teacher-centered is no longer appropriate in the class where the teacher that dominating. The learning must focus on developing students' competencies in facing the demand of 21st century-society. Nowadays students are not only required to be able to get good grades from a test but how students can face real life from the learning outcomes obtained is more important (Azhary & Ratmanida, 2021). In the 21st century learning teacher must be able to become facilitators and mediators to explore the potential of students (Cahyana et al., 2018).

Various technologies can be utilized by the teacher to be a part of learning process as learning media. Learning media means any tools that function to support the teaching and learning process. The media can help teachers convey learning material more easily so it can be absorbed by students more easily and quickly (Azizah et al., 2022). The importance of using learning media in the learning process is because by the help of media, the teacher can attract and keep students motivated during the learning (Dewi et al., 2018). Moreover, learning media can overcome the limi-

tation of space and time. Based on the impact of Covid-19 in 2020 in Indonesia, which drastically changed the learning system to online learning from offline learning. Through learning media today's learning can be done every time and everywhere if the media chosen is accordance (Dewi et al., 2018). The use of appropriate learning media can give better quality of learning for students, as well as in teaching English for young learner.

English as an international language is taught in Indonesia as a learning subject, even though this language was not their native language (Nilufar Kadamovna, 2021). Rendering English for young learner is necessary to prepare the young learner for the future to able to communicate widely over the world. The teacher has to ensure that students have a good ability in English and train their 4C skills, especially in critical thinking in English. However, in teaching English for young learner (TEYL) many obstacles faced by the teacher because young learners have their own character. In Indonesian's education setting, learners who are between seven to twelve when they already start their formal education are categorized as young learners (Kastuhandani, 2014). In addition, children who have no puberty yet can called as young learners (O'Grady et al., 1989 as cited in Dewi, 2012).

Contrast with adult learner, teacher have to understand that the basic characteristics of young learning is that they are more enthusiastic and livelier in following the lesson (Prayatni, 2019). Young learners are more courageous in expressing their thoughts and are more curious about everything that interests them (Yetreberg, 1990 as cited in Dewi, 2012). Also, in their age young learner still have golden brain which means they can easily absorb any knowledge to their brain (Sukarno, 2012). Hereafter, the most visible characteristic of young learners is that they like to play, which sometimes makes them unable to take learning seriously, especially if the learning is boring. If the learning cannot run with fun, young learner who have a short attention span can easily distracted with others more interesting (Ningsih, 2020). Considering this, the teacher must be smart in selecting media to provide a fun learning environment toward English for young learners to catch their attention to the learning.

A number of new technologies in today's era have emergent which is caused students in recent years are growing up by digital era. Students is called as digital native learners, since their exposure to the digital tool such as smartphone (Ruṣic & Dumancic, 2015). The high development of smartphones in the world caused students to spend an average of eight to ten hours playing their smartphones, especially for playing games rather than studying (Basler & Dostál, 2015). Hence, looking at this involving game in learning is an interesting invention for teachers to use in the learning process.

Game is a tool that has been special designed to provide a fun environment that makes game much loved by children. Games do not only have a negative meaning, but educational games are indeed created to be able to provide learning that is fun but still relevant to serious learning (Sukirman et al., 2017). Learning that involves games as a medium provides renewal to education, because by using games traditional methods can be changed to be more meaningful (Furdu et al., 2017). Additionally, adding game in the learning process can keep students' motivation in following lesson especially English. If the learning can run in a pleasant way, the students will keep their attention to the lesson. By playing game, students will not feel bored because the game provides many aspects like challenge, reward, animation, etc., increasing the willingness to study (Zirawaga et al., 2017).

Many games are provided on the internet, as a teacher, we can adjust which game is appropriate for the students' needs. However, game also can be developed based on the syllabus and by looking at students' need. In this case, to develop a game, especially for educational purposes, there are many aspects that should be considered and thus can create an excellent game to be used in the learning process. Every game design must pay attention to existing challenges to motivate students to continue learning, clear goals for what the game is being developed for, then fantasy, and also feedback so students can get automatic feedback on the results of their games so they can learn directly from their mistakes. them without waiting for the teacher to provide feedback (Tuqa & Lutfi, 2014).

Based on the exposure above, the research realizes that developing educational game is necessary as an interactive learning media to be used in the learning process especially for primary students in 6th grades. The game will be developed based on the topic in the school syllabus concerned school. This game is expected to be able as a support for learning English for teachers.

METHODS

The research used Design and Development (D&D) proposed (Richey & Klein, 2005) concerning to ADDIE model. Design and De-

velopment (D&D) is chosen by the researcher as an empirical basis for creating a new product for instructional or non-instructional purposes. The ADDIE model consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. These stages will create an efficient, effective, and practical instructional product. The development procedure of the product can be seen in figure 1.
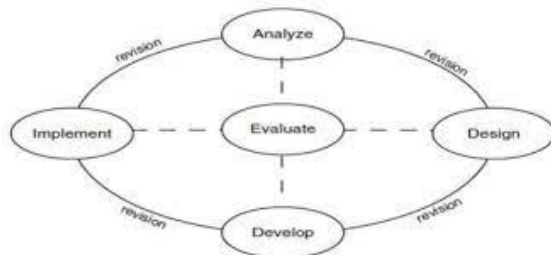

Figure 1. The ADDIE Model

The subject of this study is primary students in 6th grade in SD Negeri 1 Astina, located in Buleleng, Bali, who will do the trials to get the validity for the product. Expert judgment is also involved in this study, as the expert who assesses the product thus can create an excellent instructional product. The researcher did an observation, interview, expert judgment, and user evaluation to collect the data needed.

The data analysis process will be conducted in two ways or it can be called a mix-method. The quantitative analysis will be described descriptively regarding the process of developing the game as the product, including the analysis stage, design, and development result. Meanwhile, the qualitative one is done by analyzing the game's validity based on expert judgment and user evaluation using a formula. The procedures to collect the data needed in this study are the following:

Analysis

The researcher did an observation and interview in this first stage to obtain preliminary data to get deeper information about the students' condition in the school, the problem, and how the learning process is done. The data is needed to create an appropriate educational game for 6th grades students for English learning. The researcher used instruments to collect all of this data, namely observation sheets and interview guidelines.

Design

Designing educational games is done by making a blueprint after obtaining important information as a reference for developing games.

Blueprint is an essential document that must be made by a product developer, which contains how the product is, starting from the navigation structure in this game written in detail page by page in a document. The storyboard of this educational game is also written in detail in a blueprint, thus facilitating game development.

Development

The development is the activity where all designs begin to be realized into a product. To develop this educational game, researchers use software called *Unity*. In addition, the validity of the game has been developed in this stage by the expert judgment to check if any mistakes or problems must be revised. The game's revision is also done by following suggestions given by the expert before the game is implemented at the school. The validation of the product can be seen in the table below:

Table 1. Validity Level Criteria

Percentage	Validity Criteria
84% - 100%	Very Valid
68% - 83%	Valid
52% - 67%	Sufficient
36% - 51%	Invalid
20% - 35%	Very Invalid

Implementation & Evaluation

The implementation stage is an activity where the game that has been developed is applied in real life. In this case, the game will be implemented in the target school whose users are the 6th grade students. The researcher needs only five students to do the trial of the game. Furthermore, after students do their trial to operate the educational game, they will fill out a questionnaire related to the practicality of the game that has been developed and whether it is easy to operate.

RESULT AND DISCUSSIONS

Analysis

Based on the results of class observations obtained in class 6B SD Negeri 1 Astina, it was found that learning English at the target school was still less effective. Many students that the researcher observed could not focus on following the lessons. They tended not to listen to what their teachers explained. The researchers even found that some students joked with their classmates rather than paying attention to the lesson. There are 12 aspects in the observation sheet that

were observed in this observation, including the use of learning media and how students behave while learning English. Learning English at SD Negeri 1 Astina lasts 70 minutes, but students can only focus for about 15-20 minutes. Although the teacher has tried to stimulate students through the questions, most students ignore the teacher in front. The researcher found that only a few students, maybe five, really paid attention to the teacher during the lesson. This problem occurs because students seem to need more interesting learning. Because while learning, the teacher does not use learning media other than the textbook that students have brought. The teacher only repeats what is in the book and does not take advantage of the availability of technology.

Moreover, the results of the interview with the English teacher at SD Negeri 1 Astina showed that the teacher was still lacking in mastering existing technological developments. This school has enough facilities such as computers, LCDs, and speakers to be utilized. However, the main barrier is teachers' lack of knowledge to use technology as a learning medium besides books. Teachers cannot use interactive learning media that can attract students to focus more on following English, especially since many students assume that English is difficult, so creating fun learning for students is very important to keep them motivated.

Design

As a continuation of the analysis stage, the researcher needs to make a blueprint based on the analysis results at this design stage. There are three relevant topics in the learning syllabus of SD Negeri 1 Astina to be used in the development of this educational game (Holiday, Narrative Text, Fable). An interesting game for each of these topics will be used to learn English.

On the holiday topic, the game concept used is called *Hangman*. In this game, students will be asked to guess a word based on the clues given regarding holiday activity, place, or feeling within a time limit. Then, on the topic of a narrative text game that will be developed called *Goldilocks*. Students must be able to arrange random words into a proper sentence and answer true or false based on Goldilocks' story with a time limit. Meanwhile, for the last topic, fable, there are two games for this topic. The first game named *Guest the Animal*, where the students will be given some characteristics related to the animal and they have to guest which characteristic that match. The second game named *Fable Story*. The game developed has a concept to train students'

listening. This is because, in the game on this last topic, students must be able to listen to the audio provided to answer the questions regarding the fabled story. The navigation structure, compiling material and making questions needed for the game are also designed in this stage.

Development

Game development is done through Unity after all the designs needed have been made. The result of the product will be in the form of an application that can be played only on Android in 2D shapes. The researcher started developing this product from the initial display or main menu containing buttons such as Developer Profile, Quiz, Material, Settings, and Exit. Next, create a Quiz page that contains all the games that students can later play for learning. The Material menu will contain all material related to existing topics to increase student knowledge. In each game before the game starts, students will also be shown instructions for playing the game. In the settings menu, there are music settings. If students want to increase or decrease the music volume in the game, they must go to this menu. Lastly, they must click the Exit button when they want to exit the game.

Figure 2. Main Menu Page
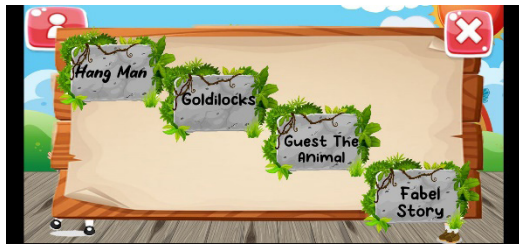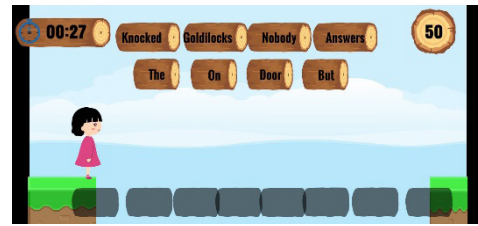

Figure 3. Developer Profile Page

Figure 4. Quiz Page

Figure 5. Material Page

Figure 6. Setting Page

Figure 7. Exit Page

Figure 8. Hangman Game Display

Figure 9. Build the Bridge Game Display

Figure 10.True or False Game Display
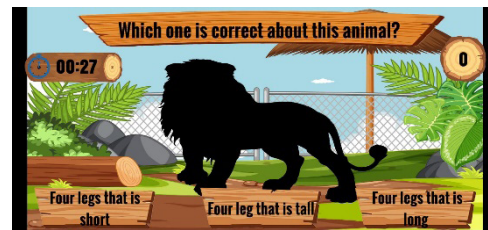
Figure 11. Guest the Animal Game Display

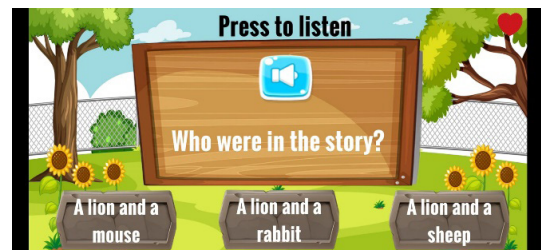**Figure 12**. Fable Story Game Display

After the product has been developed, expert validation is done. There are three expert judgments: two lecturers and one English teacher who teach English. The validation expert sheet consists of two aspects: media and content. The media aspect here assesses animation, background, clarity of writing and images, ease of operating applications, etc. In contrast, the content element is more directed to the material's suitability and questions, language use, etc. There are 29 questions that should be fulfilled by the expert judgment, where the score is 1 as the lowest and 5 as the highest. The validation results can be seen in table 2.

Table 3. Expert Validation Result

No	Expert	Media Aspect	Content Aspect	Total
1.	Expert 1	91	39	130
2.	Expert 2	91	38	129
3.	Expert 3	87	41	128
TOTAL				387

Based on the table 3, it is found that the total score from the three experts 387. To get the validity of this educational game, it is necessary to find a percentage using the formula below.

$$P = \frac{Total\ score}{Total\ the\ highest\ score} \times 100\%$$

The total score is 387, and to get the highest total score, the researcher multiplied the number of questions which is 29 by the number of experts, and the highest score is 5 so the highest score is 435.

$$P = \frac{387}{435} \times 100\% = 89\%$$

The formula above shows that the average expert validation about the game is 89%. Here, indicate that the product, an educational game, has the "Very Valid" criteria. However, experts also provide some suggestions to make this game more feasible for use in learning.

Implementation & Evaluation

The game implementation uses 5 students from grade 6 as respondents to use the game. The trial was conducted to obtain data about students' views as game users on the validity of the games that have been developed. Product implementation for students is done online where researchers send games that have been previously revised according to experts and then ask students to play all the games in it.

Further, the evaluation is done. After students play the game that has been given, they are given a questionnaire in the form of a *Google Form*. There are 17 questions related to the game. 5 students who have been selected to be the subject of this game trial will fill out a questionnaire based on their experience using the game. From the results of the *Google Form* questionnaire that students have filled in, the results are as shown in the table 4:

Table 4. Students Evaluation Result

No	Expert	Total
1.	Student 1	80
2.	Students 2	76
3.	Student 3	74
4.	Student 4	77
5.	Students 5	76
TOTAL		383

The table 4 shows that the average student gives a score between 70-80 and from five students as respondents, the total score obtained is 383. Like the formula used to find media validity in expert judgment, user evaluation also uses the same formula. In addition to looking for the total score, the researcher also looked for the highest total score by multiplying the number of questions, namely 17, by the number of respondents, namely 5, and the highest score, namely 5, with a result of 425.

$$P = \frac{383}{425} \times 100\% = 90\%$$

The result shows that the percentage from the students' evaluation is 90%, indicating the media is "Very Valid". It is means that the game is easy and practice to be used by the user. Students can easily use this game on their own smartphones and also the content of this game can make it easier for them to learn English apart from the textbook they get at school.

Discussion

Developing game-based learning media for primary students will provide a new learning experience for grade 6 students. Educational games designed based on an analysis of problems that occur in target schools get maximum results from experts and students as users of this educational game.

The results of this study show that the development of this educational game is very valid and feasible to support learning English for grade

6 students based on the data analysis carried out. With a percentage of 89% from expert validation results and 90% from user evaluation. This finding is also consistent with the findings from research conducted by (Khoirunnisya et al., 2021) those who also developed educational games using Construct 2 software where they declared that the game developed had valid criteria and was feasible to use. Likewise, the development of learning media developed by (Hermita et al., 2021) improve students' number sense and get positive feedback from experts and students.

This development of educational game-based learning media for primary school students can provide more fun learning for students so that the problems experienced by teachers can be overcome with this game.

CONCLUSION

Learning is an aspect that greatly influences the quality of human resources. Providing the best learning is very important for students. The better the learning provided, the better the quality of the output from students. But as a teacher, you must be aware of the current innovations and changes. As a result of the rapid development of technology, games can be used as learning media in learning English. This media was developed using (D&D) referring to the ADDIE model so that it can create an Android-based educational game for learning English for elementary school students, specifically for grade 6.

Based on the results of the validation carried out by three expert judgments and five students as users of product trials, it shows that from the expert judgment validation of the game, the percentage is 89%. At the same time, the results of the user evaluation of this game with a small group of 5 students get a percentage of 90%. Thus, it can be concluded that this educational game is valid and appropriate to be used as a supporting medium in learning English.

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