Game Website-Based English Learning Developed for Elementary School Students in Fourth Grade

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A R T I C L E I N F O

A B S T R A K

Banyak sekolah di Indonesia yang masih menggunakan metode pembelajaran konvensional dalam proses pembelajarannya. Yaitu masih menggunakan buku sebagai media pembelajaran. Media pembelajaran yang digunakan pada era 4.0 masih minim dan jarang menggunakan teknologi sebagai media pembelajaran. Gamifikasi dapat digunakan sebagai media pembelajaran alternatif yang dapat membuat proses pembelajaran menjadi lebih efektif, menarik, dan menyenangkan. Penelitian ini bertujuan untuk mengembangkan media pembelajaran berupa permainan bagi siswa sekolah dasar dalam pembelajaran bahasa Inggris. Penelitian ini menggunakan metodologi design and development (D&D) dan model ADDIE. Subyek penelitian adalah siswa kelas IV sekolah dasar. Instrumen yang digunakan adalah angket dan observasi. Dan analisis data yang digunakan adalah deskriptif kualitatif dan deskriptif kuantitatif. Data yang dihasilkan berupa (1) hasil desain dan pengembangan dengan metode ADDIE (analisis, desain, pengembangan, implementasi, dan evaluasi). (2) Memperoleh hasil validitas dan keefektifan produk dari expert judgment, guru, dan uji coba produk kepada siswa. Dari hasil expert judgment diperoleh hasil yang sangat valid. Dan hasil siswa sangat valid, dan beberapa hal perlu direvisi lagi untuk menyempurnakan produk.

A B S T R A C T

There are lots of schools in Indonesia still use conventional learning method in learning process. That is still using the book as a medium of learning. Learning media used in the 4.0 era is still minimal and rarely uses technology as a learning medium. Gamification can be used as an alternative learning media that can make the learning process more effective, engaging, and fun. This research aims to develop learning media in the form of game for elementary school students' in learning English. This study uses a design and development (D&D) methodology and the ADDIE model. The research subject is the fourth-grade elementary school students. The instrument used was a questionnaire and observations. And the data analysis used is descriptive qualitative and descriptive quantitative. The resulting data are in the form of (1) the design and development results using the ADDIE method (analysis, design, development, implementation, and evaluation). (2) To obtain product validity and effectiveness results from expert judgment, teacher, and product trial to students. From the results of expert judgment, very valid results were obtained. And the students' results are very valid, and several things need to be revised again to perfect the product

1. INTRODUCTION

This era is known as the era of globalization or the 21st century. This era is synonymous with the use of technology in all aspects of human life (Iswara et al., 2021; Shahroom & Hussin, 2018; Sobandi et al., 2021). One of them is education, in this aspect, it requires the use of technology as a learning medium. According to previous study three primary skills must be possessed in the 21st century (Trilling & Fadel, 2009). The first is a career that can be in the form of leadership and responsibility and life skills, which are in the form of flexibility and adaptability. The second skill is using digital technology, media, and literacy skills. The third is 4C, namely collaboration, creativity, critical thinking, and communication. Apart from these three primary skills, in the 21st-century era, there are also higher-order thinking skills that need to be improved (Ghani et al., 2017; Karagöz & Çakir, 2011; Mizbani & Chalak, 2017).

Higher-order thinking skills enable students to change their way of thinking and change their understanding because higher-order thinking skills are cognitive thinking that can help students in the process of analysing, evaluating, and integrating facts and ideas (Dinni, 2018; Johansson, 2020; Margana & Widyantoro, 2017). In the revolutionary era 4.0, there were several principles in the learning system. The first is the learning process using the student-centered method. This method can make students more active in class and can develop students' interest in learning (Harris & Bacon, 2019; Putriani & Hudaidah, 2021). In this case, the teacher is only

a facilitator and mentor to help students if they find it difficult to understand the material. The next thing is that learning must be collaborative. Students are asked to be able to collaborate and be cooperative. One example is solving a problem and seeking information; students are asked to collaborate with their classmates (Bechter & Swierczek, 2017; Williams et al., 2009). With this, students can improve cooperation and respect each other. From these principles, student-centred methods must be developed frequently because this method is very important in the current era. After all, students will have learning abilities that are more interactive, varied, and interesting (Coskun & Marlowe, 2015; Sari et al., 2015).

Gamification is a learning method that many people know. Gamification has many positive impacts; in the learning process, students will enjoy and be more interested in learning (Hamari et al., 2014; Mohamad et al., 2020; Reed et al., 2020). The game design used in the gamification concept is taken from existing learning materials. Games can provide three psychological benefits: emotional, social, and cognitive (Lee & Hammer, 2011; Luo et al., 2021; Sánchez et al., 2021). Games can be used as learning media because students can be motivated to learn when using games. According to previous study gamification has several benefits, namely, first, learning becomes more fun, students become happier and not bored in learning because learning is combined with games (Lee & Hammer, 2011). Second, students become more motivated to learn. The third is that students can focus more on understanding the learning material. And the last is students become more active in class. It can be concluded that gamification is a good strategy to be used as a learning medium (Mee Mee et al., 2020; Rahmani, 2020; Shebastian et al., 2020).

Teaching English to children is different from teaching adults. The character possessed by children is different from adults. Children have the characteristic that they still like to play and get bored easily. They are also very easily distracted and sometimes feel uncomfortable in the learning process (Pike et al., 2020; Pransiska, 2017; Taylor et al., 2015). Therefore the teacher must create learning strategies and activities that make students understand the material well and not feel bored when studying (Habók & Magyar, 2018; Pereira et al., 2020). However, learning in Indonesia still has a lot of schools that use conventional learning methods. That is still using the book as a medium of learning. Learning media used in the 4.0 era is still minimal and rarely uses technology as a learning medium. According to previous study reveal that 96% of elementary school students in Buleleng Regency have gadgets to play digital games (Mahayanti & Utami, 2017).

However, it is not used optimally for learning. If done optimally, suppose the use of technology will positively impact students and teachers. In line with previous study that state learning using gamification can increase student learning motivation (Lawalata et al., 2020). According to other study using gamification as a learning medium during online learning is fun and efficient (Hadi et al., 2020). In addition, other study states that gamification can be used as an alternative learning media that can make the learning process more effective, engaging, and fun (Kaufmann, 2018). All the previous studies said positive statements about gamification. And after seeing the problems that occur in Indonesia, especially in the Buleleng district, the research aims is to develop gamification to help elementary school students learn English and improve their HOTS abilities.

2. METHOD

This research uses design and development (D&D) methodology. This type of research was chosen because it can be seen from it that it will produce a gamification for learning media. Design and development are divided into tool and product development and model development (Richey & Klein, 2007). This research includes the first category, namely, product development. This research model consists of 5 simple stages, namely (1) analysis, (2) design, (3) development, (4) implementation, and (5) evaluation. The ADDIE model procedure is show in Figure 1.

The research subject is the fourth-grade elementary school students at SDN 1 Astina. And the object of this study is to develop game as an English learning medium for students in fourth grade elementary school. Data collection was carried out using observation and interview methods for the implementation stage using formative implementation, namely evaluating data in the form of expert judgment results and evaluating data on the results of trials in small groups. The instruments used are observation, questionnaires, and questionnaires used to collect the results of expert reviews. And the data analysis was carried out in a qualitative and quantitative descriptive manner.
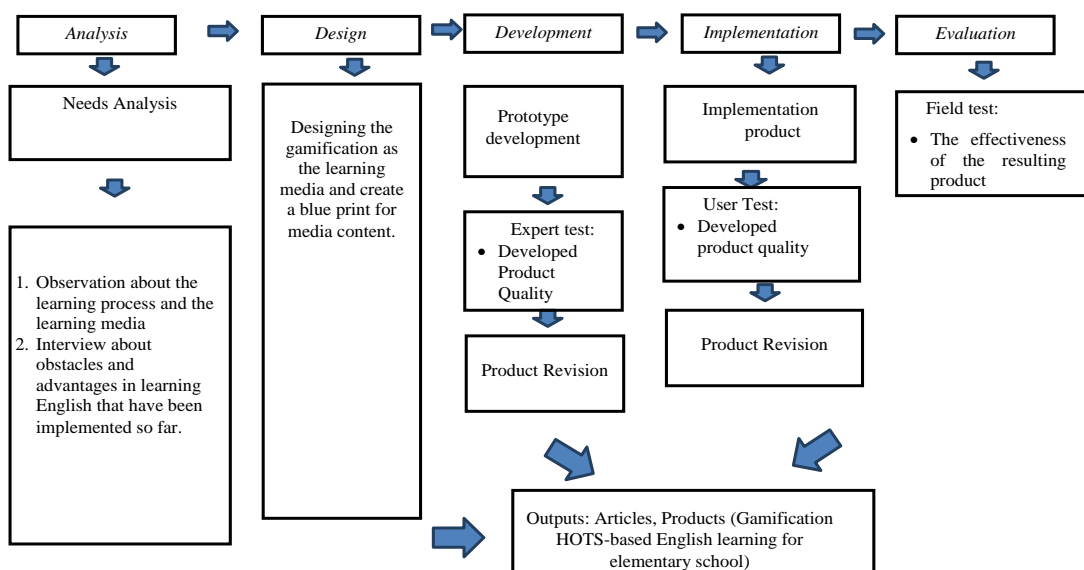
Figure 1. The procedure of the development model of ADDIE

It can be concluded that this study uses the ADDIE model with five stages. First, the analysis is carried out by observing the learning process and learning media used, then conducting interviews with teachers regarding the challenges and advantages of learning English. After obtaining the data related to the analysis, the researcher carried out the design stage by designing a blueprint based on the teaching modules used during the learning process. The blueprint that has been created will be developed at the development stage. After that, the product will be implemented. And the last stage is an evaluation after getting the implementation results and finding out the product's effectiveness. The level validity and effectiveness level is show in Table 1.

Table 1. Level Validity and Effectiveness Level

Percentage	Qualification
84 % - 100%	Very Valid
68% - 83%	Valid
52% - 67%	Quite valid
36% - 51%	Less valid
0% - 35%	Not Valid

The data obtained through interviews and observations will be analysed qualitatively. Where the data obtained will be described following the scores described as show in Table 2.

Table 2. Validation questionnaire scoring criteria

Score				
5	4	3	2	1
Very appropriate	Moderately appropriate	Less suitable	Not appropriate	Very inappropriate

3. RESULT AND DISCUSSION

Result

This study followed the procedure stages of analysis, design, development, implementation, and evaluation. The first stage namely analysis. Analysis of teacher interviews about what learning media is often used, whether using technology-based learning media such as digital games. Whether during the teacher's learning HOTS learning pressure. From the results of the interviews, during the learning process, the teacher used learning media more often, namely textbooks. The analysis of observation in the class consists of the activities of the teacher teaching in the class and the activities of the students in the class. From observing teacher activities in the classroom, teachers still use a teacher-centered learning approach. For learning materials,

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the teacher only uses books as the main source of the material. Even though they only used books, from the results of observations, some students seemed interested and enthusiastic in learning and participating in learning. Next is the analysis of teaching modules in grade 4 elementary schools using the independent curriculum. The words syllabus and lesson plans have been replaced with teaching modules and ATP. There are seven topics in the 4th grade English teaching module in semester 1. Of these seven topics, the researcher chose three topics to be used as the basis for making a game.

After the analysis stage, the next is the design stage of developing gamification as a learning medium. For this stage, the researcher designed a blueprint based on the teaching modules and topics that the researcher had chosen to make a game. The following is a game design developed as a learning medium. Topic 1 is about verbs, and the researcher designed a game on this topic with two levels. Level 1 is matched up, and level 2 fills in the blank. At level 1, the researcher designs a game where players match pictures and skills randomly. Then, at level 2, the player will be given a sentence containing an empty box and will be assigned to fill in the box with the correct answer. Topic 2 is about verbs, and the researcher designed a game on this topic with two levels. Level 1 is match-up, and level 2 is fill-the-blank. At level 1, the researcher designs a game where players match pictures and skills randomly. Then at level 2, the player will be given a sentence that contains an empty box, and the player will be assigned to fill in the box with the correct answer. Topic 3 is about the room at home. This topic also consists of 2 levels. Level 1 is dragging me, and players will be asked to drag objects that match the boxes and names provided. Then level 2 is the labelled diagram, and the player will be asked to fill in the correct answer as shown by the label line.

The resulting product is a web-based game that can be accessed using a link without downloading it on a gadget. The product will be more optimal if it is accessed using a PC and a computer. The development stage is the third stage. The activities carried out in this stage are searching for and collecting material and images relevant to the material related to the topic to be developed in the game product. After that, the game will be developed into a web-based application using an articulate storyline 3. Validation of the game prototype is carried out in this step. Experts carry out the validation process.

After the development stage, it will be followed by the implementation stage. At this stage, the game product will be tested in small groups. The small group will consist of 5 students from grade 4 elementary school. They will be asked to rate the product prototype development. The last stage is evaluation, and there are two types of evaluation: formative and summative. This study only uses formative evaluation, which aims to get input and suggestions to be able to revise and validate product development. This study's formative evaluation has also been carried out in stages like the ADDIE model steps.

Product

The product produced in this research is game development as a web-based English language learning medium. The game that will be developed will contain a splash screen, a main menu containing guides, materials, quizzes, profiles, and quit. The material menu will include three material topics that will be discussed before players work on existing quizzes.

Validity

The validity and effectiveness of the product are obtained from the results of 3 expert judgments. The results of expert judgment are show in Table 3.

Table 3. Score of the product by the three experts

No.	Experts	Total Scores (5 x items) + (4 x items) + (3 x items) + (2 x items) + (1 x items)
1.	Expert 1	= (5 x 12) + (4 x 16) = 60 + 64 = 124
2.	Expert 2	= (5 x 14) + (4 x 14) = 70 + 56 = 126
3.	Expert 3	= (5 x 15) + (4 x 13) = 75 + 52 = 127

Based on the Table 3, the value given by each expert is obtained from the product of the points given multiplied by the number of questions based on points. Then the final expert score is used to determine the

effective results of the product to be developed using the pattern mentioned in the method. Forproduct effectiveness results based on the results of the expert judgment score above, the percentage and qualification obtained are show in Table 4.

Table 4 The quality of the product

No.	Experts	Total Scores	Percentage	Qualification
1.	Expert 1	124	88.57%	Very valid
2.	Expert 2	126	90%	Very valid
3.	Expert 3	127	90.7%	Very valid

Based on Table 4, show the three experts above, it can be concluded that the product being developed has obtained a "very valid" qualification and can be developed as a medium for learning English. The product that has been produced has received positive comments, and experts have also praised the learning media that this game is very easy to use for 4th-grade elementary school children. In addition to the results of expert judgment, the evaluation stage also obtained analysis and evaluation results from teachers and students as users. The researcher used five students to use the game the researcher had developed. After that, they were asked to respond to a questionnaire after using the game. The results of the teacher judgment and student questionnaires are show in Table 5.

Table 5. Teacher Judgment and Student

User	Total scores	Percentage	Qualification
Teacher	= (5 x 12) + (4 x 16) = 60 + 64 = 124	88.57%	Very valid

Based on the Table 5, it can be concluded that the teacher gives a very valid game rating to use as a medium for learning English. The teacher also gave positive comments related to the game products produced. After assessing the expert and the teacher, the product can be tested in small groups. The small group used by the researcher was 5 grade 4 elementary school students. The results of the trial in a small group of students are show in Table 6.

Table 6. Trial in Small Group of Students

No	Users	Score	Percentage	Qualification
1.	Students 1	81	90%	Very valid
2..	Students 2	85	94.4%	Very valid
3.	Students 3	84	93.3%	Very valid
4.	Students 4	85	94.4%	Very valid
5.	Students 5	85	94.4%	Very valid

Based on the Table 7, the results of the student trials resulted in a "very valid" product. Students also gave positive responses and some suggestions. Because of several questions, they disagreed with some, namely on the statement that the game responded quickly and the ease of navigation buttons. Then the product needs to be revised again.
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Discussion

Based on need analysis the technology media the teacher uses usually depends on the material being taught. And relation to HOTS learning, in elementary schools, not all can apply critical thinking, especially for learning English. It can be interpreted that the English language learning media has been combined using technology and books (Istri Aryani & Rahayuni, 2016; Mahendra et al., 2021). However, HOTS students' abilities need to be improved so students can get used to critical thinking. However, increasing higher-order thinking skills has not been seen in this learning because students only focus on the instructions given by the teacher. And then, for analyzing student activities in the classroom, it can only be seen that some students are more interested and enthusiastic. They are also able to think critically in participating and answering questions.

The result regarding to quality that judges from three experts said the qualification of each aspect are very valid. This also supported by the teacher judgment that also found very valid criteria. The result of student trials resulted in a "very valid" product. So it can be concluded that this product is valid and suitable to be used as a learning medium for English language learning medium in grade 4 elementary school students. Web-based

game can be accessed using a link without downloading it on a gadget. The product will be more optimal if it is accessed using a PC and a computer (Laksana & Fadhilah, 2021; Werdiningsih et al., 2019). Website-based learning system can be accessed without any place and time constraint, so that learners can study English autonomously and flexibly

In line with previous study that state the use of gamification concept integrates several elements embedded in game applications, such as point collection, achievement, ranking, which are wrapped as English learning materials (Pambudi et al., 2019). Based on a sample of the conducted test, it shows that the functional system has been running as designed and the result of the tests showed a 100% validity level. Based on the questionnaire, gamification elements could increase student motivation. This study focuses on the effectiveness of using website games for learning vocabulary on fifth grade English as a foreign language (EFL) learners' communication skills (listening, speaking, reading, and writing) development (Al-Sharafat & AbuSeileek, 2012). This study revealed that website-based instruction showed more improvement on the achievement test in communication skills than traditional instruction. The findings of the study also indicated that the mean scores on the word search game provide the best indicator to stude nts' later performance on the communication skills test. Another finding indicated higher retention level in favors of the experimental group. The implications of this study provide an overview of the game website-based English learning developed for elementary school students in fourth grade. The development of a website-based English learning game is useful for elementary school students in improving their English language skills. However, this research still has limitations, the limitations of this research lie in the research subjects which only involve students in one school. Therefore, it is hoped that future research will be able to deepen and broaden the similar research in the development of website-based English.

4. CONCLUSION

The conclusion is that this research uses a design and development approach and the ADDIE model. Namely, there are five stages, analysis, design, development, implementation, and evaluation. The product developed is a web-based learning game for grade 4 elementary school students. Researchers conducted trials with three experts, and the results obtained were that the products developed were very valid. And for the trial, the teacher got a valid result. Then the trial results for small group students were very valid. From all the results obtained, it is concluded that the product is very valid to be developed as a learning medium.

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