

## Developing of Interactive Game Based on Role Play Game to Improve the Reading Abilities

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### Abstract

The ability to read is the most important thing for children's intellectual development. One of the efforts is application of interactive form games. Games can improve children's reading skills because they match concept of children's learning while playing. This study aims to develop interactive RPG-based games to improve children's reading skills. The method used is ADDIE. The steps taken after the product is made are validity test, practicality test and effectiveness test. The stages after the product are made are validity test, practicality test and effectiveness test. The results of the validity of the game were 94.5% (very valid category), and 94% practicality (very practical category). In terms of effectiveness, this game was proven to be able to improve children's reading skills, namely 91%. Emphasis on the reading aspect includes the ability to read pictures, say each letter in 1 word, read words, find same vowels and letters. Based on 5 items, effectiveness shows a strong relationship between aspects of image recognition, reading words, finding the same letters to improve children's reading skills using interactive RPG games. Two other items are inferior, namely mentioning each letter in one word and vowels because game does not guide specifically like other aspects. This game is useful in increasing reading literacy, counting through interactive games so that children will be happy in the learning process, besides that it can hone children's visual and kinesthetic intelligence.

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## INTRODUCTION

The early childhood education is the foundation in optimizing the basic abilities of children. According to the National Association for Education of Young Children (NAEYC), the age range of early childhood is 0-8 years. According to Law Number 20 of 2003 concerning the National Education System relating to Early Childhood Education written in Article 28 Paragraph 1 which reads "Early Childhood Education is held for children from birth to six years and is not a prerequisite for attending basic education". One of the formal education pathways in early childhood education (PAUD) is known as kindergarten. Kindergarten is a form of formal education for children aged 4 to 6 years. At this age, the growth and development of children occur so rapidly that at this time it is the right time to provide stimulation in the child's learning period that is appropriate to the age stage and characteristics of the child.

Language skills are one of the abilities that are needed by children because through language children can meet their needs and interact with their environment, gain knowledge, and others. Reading lessons are the basis for someone to get an education and determine the success of children to learn at the next level of education. Reading is a process of children's activities in recognizing the form of letters/words/sentences, symbols, and images so that the child understands the purpose, meaning and purpose of the reading, symbols, or pictures into a simple conclusion.

The utilization of technology in developing reading skills can be done by providing interesting games for children. In reading skills, at the age of 4-6 years children can be taught to read. The age of kindergarten has been able to see itself as a reader, giving meaning to images. According to (Irdawati & Darmawan, 2017), reading is one of four language skills delivered in the Bahasa Indonesia language learning, except for listening skills, speaking skills, and writing skills. Yulsyofriend (2013) has stated that reading is a unified integrated activity that includes several activities such as recognizing letters and words, linking them with sounds and their meanings, and drawing conclusions about the purpose of reading. Based on this it is concluded that reading is one of the important abilities in recognizing letters and words by sound or understanding meaning so that children gain experience in the form of knowledge and information.

Nizak (2011) has stated that the game is

one of the tools that can be used as a way to carry out knowledge transformation to children. Therefore, when someone plays a game, it means that it is not limited to a game that can entertain or engage in meaningless joyful activities, but more than that, a game that is played by anyone will have an educational meaning, even without being realized by the person who is doing it. According to the Big Indonesian, Interactive Dictionary is to do mutual action, between relationships and mutually active. Human relations with other humans is a necessity because humans are social creatures. This is also done in terms of play, especially in early childhood. Playing with quality games can eliminate negative emotions into positive emotions for children, it can be concluded that interactive games are tools to find fun creativity by taking action, being active, and having interconnected relationships (Toppe et al, 2020; Alfano et al, 2020; Berge et al, 2019; Luo et al, 2018; Gambacorta et al, 2018). According to Azhar (2011), the application of RPG (Role Playing Game) that will guide players actively digging information to enrich knowledge while playing.

Based on the survey, the use of technology has a positive impact on children's development and is beneficial in the learning process. However, there are still many lessons that have not yet utilized technology, such as interactive digital games. But in reality, the development of the era that demands change quickly requires educational patterns that are in accordance with the digital era. Early childhood children will develop more when given a game-based educational game (RPG) so that children's reading abilities develop optimally. In addition, the media used in learning are considered to be less attractive children. Therefore, this research was conducted by focusing on the Development of Interactive Games based on RPGs to improve reading skills in early childhood.

The objectives in this study are to (1) produce an Interactive RPG-based Game Development to improve children's reading skills in kindergarten; (2) knowing the validity of RPG-based Interactive Game Development to improve children's reading skills in kindergarten; (3) knowing the practicality of developing RPG-based Interactive Games to improve children's reading skills in kindergarten; and (4) determine the effectiveness of RPG-based Interactive Game Development to improve children's reading skills in kindergarten.

## METHODS

The type of research is a research and de-

velopment of research and development (R&D) research conducted to improve teaching and learning in kindergarten. According to Sugiyono (2012), research and development are research methods used to produce certain products and test the effectiveness of those products. These products are not always in the form of objects (hardware), such as books, machines, modules, teaching aids, etc. but can also be in the form of software, such as learning models, application programs, and others. Development in this research about software in the form of application programs created using Adobe flash applications that can be run on Android applications, notebooks, and PCs. The development procedure in this study follows the sequence of activities in the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model proposed by Branch (2009). A more detailed explanation of the development procedure is described as follows.

The game was created using Android Studio version 4.0.0, using an animal themed Story Board design. This production was carried out with a Core i-7 PC Processor, 8 Gigabyte Ram specifications and 1 Terabyte hard drive, and using Adobe Photoshop CS6, Corel Draw, and Android Maker software. Games that have been made will be developed and installed on an Android smartphone or tablet that can be used for early childhood learning.

**Analysis.** The main activity at this stage is analyzing the importance of product development. Product development begins with a lack of learning that has been applied primarily to improve children's reading skills. Problems can occur due to the lack of facilities to develop interesting reading abilities for children. This analysis is carried out by gathering information and identifying to make products that will be developed according to the needs in terms of observations and interviews.

**Design.** This activity is a systematic process that starts from setting learning objectives, designing learning tools, designing learning activities, and designing learning outcomes evaluation tools. This stage is a conceptual design that underlies the process of further development.

**Development.** At this stage began to realize the design into a product that is ready to be implemented and make instruments to measure the performance of the product. The product to be developed will be examined by the developer to find out whether the product can be used properly, and all components can run exactly as expected. Then the product is consulted to expert

lecturers and teachers before being tested. Suggestions and input obtained are revised or improved products that are developed.

**Implementation.** The implementation phase is carried out by preparing an RPG-based Interactive Game Development product after it has been revised according to the direction of the experts and has been declared feasible by the expert and tested on the teacher in learning activities, then the teacher evaluates the Development of an Interactive RPG-based Game to determine the feasibility of developing an RPG-based Interactive Game when used by the child and the child's response after playing. The results of the teacher's assessment and response are followed up at the evaluation stage.

**Evaluation.** This stage carries out evaluation activities to measure the achievement of development objectives. Evaluation results are used to provide feedback to the user or child. Revisions are made according to evaluation results or needs that cannot be met.

Data collection techniques in this research is to use instruments in research development. The instrument is one tool for data collection. The data in this research development are questionnaires. The questionnaires were used to obtain validity, effectiveness, and practicality data from RPG-based Interactive Games (Sugiyono, 2015) with the following data analysis techniques.

**Validity Analysis.** Data collected from this study are the results of RPG-based Interactive Game validation. Validity analysis using Aiken's V Validation using the formula:

$$V = \sum s / [n(c - 1)]$$

Information:

$$s = r - l_0$$

$l_0$  = The lowest validity score (in this case = 1)

$c$  = The highest validity score (in this case = 4)

$r$  = The given number by the validator

The results of the Aiken V calculation range from 0 to 1. After the results of the Aiken V calculation, the media eligibility criteria are grouped:

0,76- 1 = Very eligible

0,51-0,75= Eligible

0,26-0,50= Eligible less

<0,25 = Not eligible

**Practicality Analysis.** User practicality test data in filling out questionnaires for principals and teachers is done by using a percentage (%) using the following formula.

$$\text{Percentage of Practicality} = \text{Ideal score} / \text{Maximum score} \times 100\%$$

After the percentage is obtained, grouping according to the practicality assessment criteria:

76% - 100% = Very practical

51% - 75% = Practical

26% - 50% = Practical less

0% - 25% = Not practical

The analysis of Effectiveness Tests. Analysis of effectiveness is obtained by counting the children who perform activities as contained in the observation sheet. The data were analyzed using the percentage technique stated by (Sugiono, 2018) as follows.

$$\text{Percentage of Effectivity} = \text{Ideal score} / \text{Maximum score} \times 100\%$$

## RESULTS AND DISCUSSION

In the analysis phase the method used by the researcher is observation of teaching and learning activities in TK. Fadhilah Amal 3 class B1. Observations and interviews were conducted to find out the curriculum used, learning activities and the use of teaching materials. The data obtained from the initial research is the initial stage in analyzing product needs is to analyze the curriculum used at Fadhilah Amal 3 Kindergarten. The purpose of the curriculum analysis is so that the direction of developing this RPG-based Interactive Game is clear. This analysis was carried out by gathering information related to RPPM and RPPH which will be used in RPG-based Interactive Games based on Basic Competencies and Main Material that refers to the 2013 curriculum implemented in kindergarten, which is about reading like reading pictures, recognizing initial letters in pictures.

The design process is the stage of designing an Interactive Game based on early childhood RPGs in kindergarten. At this stage, the instrument was also designed to measure the validity of the developed RPGs. First, determine the theme of the game. Determining the theme or material to be loaded in the game is an important thing. The theme determines how the shape and design of the game. The theme in the RPG is pets. It also determines the achievement of learning objectives. Almost all learning can use games so that the use of technology in learning is one way that can be done by an educator.

Second, determine the material and aspects that are developed. Determination of the theme in general should be more classified into more

specific to the sub-themes and material to be delivered. Early childhood learning usually must be simple and easily understood by children. In addition to material, aspects that will be developed also need to be planned. The aspects developed can focus on one aspect or several aspects at once such as moral and religious values, cognitive, fine and gross motor skills, social-emotional, language, and art. In this study developing aspects of language focused on early reading.

Third, determine the shape of the game in the game. The form of the game is how to play games such as puzzle-shaped games, problem-solving based games, guess-shaped games, matching image games, counting and throwing dice games, and others. A good game for young children is a game that how to play it in accordance with the material and aspects that are developed. For example, for the development of numeracy skills, children are more suitable to use games to match images with the number of objects. The right choice will produce games that are able to convey messages or material well to children, of course, in a way that is fun for children.

Fourth, design a storyboard. Storyboards are sketches and game designs that are described in detail. This is useful to make it easy for programmers to make games that are in accordance with the design or game design. Storyboard not only in the form of a picture but also an explanation of how the game runs or how to play the game. Things to note are the interesting side of the game or the strengths of the game and the rewards for winners. Games for young children must pay close attention to rewards or praise so that children feel happy and excited to complete the game. Rewards can be in the form of scores, applause, thumb animations, or words of praise when the child is able to complete the game properly or correctly. Game storyboards will be exemplified in the next chapter.

Fifth, make audio-visual designs. In-game audio design in the form of music that fills the game and voice commands or questions and praise in the game. Audio selection is designed and determined by the creator of the game. The game visual design includes game background design, in-game images, and game icon display. Audio Visual game design is one of the determinants of game quality. An attractive audiovisual design will make interesting games such as backgrounds that are designed or drawn with attractive and cheerful background music. The design should be designed by yourself so that it will be different or not seem ordinary.

This phase aims to produce an Interactive

Game Development based on RPGs to improve the ability to read early childhood in kindergarten that is valid, practical, and effective. The product that you want to develop is checked by the developer to find out whether the product can be used properly, and all components can run exactly as expected. The results of the development phase of an RPG-based Interactive Game to improve early childhood reading skills in kindergarten are as follows.

**RPG Development.** RPG-based Interactive Games to improve reading skills were developed using flash applications that can run on the Android Operating System, Windows (XP, Vista, 7, 8), and PC or laptop to enter material and videos that have been prepared. For source designs, the initial design is self-designed. The results of the development of early childhood RPGs in kindergarten.

**Validation results by experts.** In the validation of the material, based on the questionnaire given, the validator suggests adding rewards in the form of audio, reviewing the game presentation systematically, and audio language should be adjusted to the language that is easily understood by children. While in the Media Validation stage, the validator suggests giving a drawing that is interesting for children on the start page of game design, clarifying the appearance of graphics and increasing volume in the game. RPG-Based Interactive Games have been validated and declared valid with the average results of Aiken's V material expert score of 0.97 and a media expert validation score of 0.90 which is included in the very feasible category.

At this stage, it is implemented by preparing an RPG-based Interactive Game product to improve the ability to read early childhood in kindergarten that has been declared feasible by experts and tested on children, then educators assess RPG-based Interactive Games to improve the ability to read early childhood in kindergarten- children to find out their worth when used. Implementation of RPG-based Interactive Game Development to improve the ability to read early childhood in kindergarten was carried out at TK. Fadhilah Amal 3 B1 in the 2018/2019 school year with 15 children. Then the assessment of the RPG was also assessed by the teachers of TK. Fadhilah Amal with a Focus Group Discussion activity.

**Practicality Test** is the level of practicality of the media used by the teacher. This activity is carried out to determine the extent of the benefits, ease of use by teachers. This practicality

test is carried out by giving practicality of RPG-based Interactive Game Development to improve reading skills. Based on 10 aspects of assessment in the practicality test RPG by 2 teachers. The total score for assessment by G1 is 37 and the total score for assessment by G2 is 36. The average percentage of practicality for each aspect of assessment by G1 is 92.5% and the average percentage of practicality for each aspect of assessment by G2 is 90%. So, the average yield of practicality is 91.25%. Practicality test results state that the Development of Interactive Games based on RPGs to improve the ability to read early childhood in kindergarten that was developed was declared very practical. Data analysis was obtained by calculating the results of the assessment of the use of children's games in the large group test class B1 of 15 children, the assessment by the class teacher contained in the observation sheet. The effectiveness assessment data of 84% can be declared effective as an RPG-based Interactive Game Development to improve reading skills in learning.

Evaluation results were obtained based on assessment sheets from expert lecturers and classroom teacher questionnaires on RPG-based Interactive Games to improve early childhood reading skills in kindergarten. From the results of the expert, the material has an adequate and valid item validity, and the results of the conclusion of the assessment of the validator are declared Eligible for use with revisions. Whereas the results of the Media experts have sufficient and valid items validity, and the results of the conclusion of the assessment of the Media Expert validator are declared Eligible for use with revisions. Material and media revisions are made to improve the media even better. The final product study is an RPG-based Interactive Game Development to improve reading skills. First, the initial appearance of the pet theme RPG game.



**Figure 1.** preface of game

Second, on the next page, there is a start button to start the game.



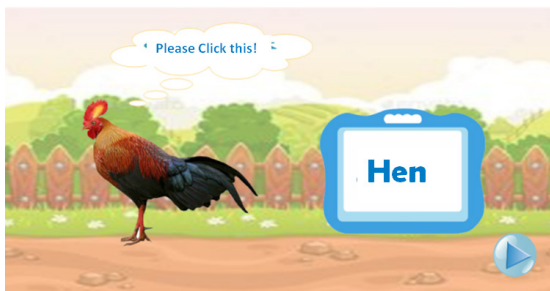
**Figure 2.** The second layer of game with start button

Third, after clicking on the start button, information about the RPG game will appear. Then click the start button. Fourth, then Level 1-3 RPG Game appears.



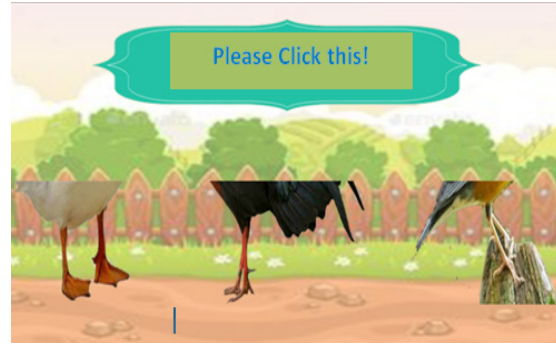
**Figure 3.** The level of game with level button

Level 1 in RPG games is the easiest level. The images that appear in the RPG game include 2-legged animals namely chickens, ducks, birds. When level 1 is clicked, a chicken animal appears. When the image of the chicken is clicked it will hear the sound “what animal is this?”. Then the child will learn to recognize the letters in the word chicken which are assisted by the sound of the word “chicken”. To continue, click the right arrow.



**Figure 4.** The stage of game

On the next page, the game will appear matching the image between chicken and chicken feet. When a child answers incorrectly, a “let’s repeat again” sound, and when answering correctly, a “great you’re right” voice will come out. The game continues directly to the next page.



**Figure 5.** The part of game with matching image

The next page will appear next animal display until level 3. After level 3 is complete the game will appear a page to return to the front page. Then click the house image to return to the front page.

After that the following display will appear “do you really want to get out?” then click yes then the game will close. Language is an important main aspect to be developed in support of other aspects. The process of improving and stimulating children’s language skills provides children with the ability to interact and gain knowledge. Children as social beings must be able to interact so they can adjust and be accepted in their environment. Language is a means of supporting in conveying ideas, ideas, and inspiration so that in human life, with language, humans more easily convey messages to other humans. both in written form, oral, and only in the form of certain symbols (Amelin et al., 2019). Language learning is inseparable from the four basic skills of language namely listening, speaking, reading and writing (Mayasari & Ardhana, 2018).

Reading activity is an attempt to receive information related to symbols or images. Children who have the ability to read will easily accept various information in the process of increasing their potential. If children at the age of entering further education do not have the ability to read, then he will have difficulty in learning various further learning (Rahmatika et al., 2019). Reading is an ability that must be possessed by early childhood. According to Irdawati & Darmawan (2017), reading is one of the four language skills presented in Indonesian language learning in addition to listening skills, speaking skills, and writing skills. According to Ulfah & Rahmah (2017), reading interest should begin to be grown when the child is at an early age, so as we get older, the development of children’s reading interest also increases. To accelerate the ability to read, early childhood can be taught slowly in accordance with the stages of child development, one

of which is by using games (Johan et al, 2020; Lievens et al, 2019; Tulloch et al, 2019; Devaine et al, 2017; Wexler et al, 2016; Jalali et al, 2015)

According to Yulsofriend (2013) states reading is an integrated unit of activity that includes several activities such as recognizing letters and words, linking them with sounds and their meanings, and drawing conclusions about the purpose of reading. According to Suggate et al. (2013), the age at which children enter school and learn to read is intuitively an important factor in later reading achievement. Based on this it is concluded that reading is an activity to recognize letters and words by sound or understanding meaning so that children get experiences in the form of knowledge and information.

Nizak (2011) stated that the game is one of the tools that can be used as a way to carry out knowledge transformation to children. According to Krisnawan (2015), game is a system where the player is involved in an artificial conflict, here the player interacts with the system and conflict in a game that is fabricated or artificial, in the game, there are rules that aim to limit the player's behavior and determine the game. According to Cahyo (2011), games are an inseparable part of the world of children, it can even be said to be very important for the growth of children's intelligence. so important is the game that wherever it is, both at home and at school, there are now various games available for children. Therefore, when someone plays a game, it means that it is not limited to a game that can entertain or engage in meaningless joyful activities, but more than that, a game that is played by anyone will have an educational meaning, even without being realized by the person who is doing it.

According to the Big Indonesian Dictionary, interactive is a mutual action, between relationships and mutually active. Human relations with other humans is a necessity because humans are social creatures. This is also done in terms of play, especially in early childhood. Playing with quality games can eliminate negative emotions into positive emotions for children, it can be concluded that interactive games are tools to find fun creativity by taking action, being active, and having interconnected relationships.

According to Azhar (2011), the application of this type of RPG game that will guide the player actively digging information to enrich knowledge while playing. Based on the description it is concluded that the RPG game is a tool to find fun creativity by taking action, being active, and having interrelated relationships and guiding players actively digging information to enrich

knowledge while playing.

The use of interactive games is a very interesting for children when technology media are used in learning (Meidenbauer et al, 2018; Vallabhajosula et al, 2016; Katsikitis et al, 2014; Jaunay et al, 2019). RPG-based Interactive Games are able to develop language skills, especially reading and other children's abilities. in addition, interest in technology can stimulate children to improve the ability to use technology (digital literacy) so that they can run the game. RPG-based Interactive Games is a game that stimulates children to be active in the learning process so that the delivery of knowledge in the game is delivered in a way that is fun for children. This game is interestingly designed with various colors and sounds such as music and voice commands. The way children play by reading pictures and writing. Children are very interested in reading during game play because because there is a response when children run the game. in addition, the child feels challenged when continuing the game to a higher or more difficult level (Schwartz et al, 2015; Aravena et al, 2013; Franceschini et al, 2013; Bonnefon et al, 2013; Huotilainen et al, 2011; De et al, 1996).

The validity of the Game product is 0.93 with the very feasible category. The validity includes material validity 0.93 and media validity 0.94. This proves that the validity of game products is at a very valid level in developing children's reading skills. Practicality test data by filling out a questionnaire by the principal and teacher with the results of practicality reaching 94% with the very practical category. The practicality assessment includes 92% media use, 94% suitability of illustrations, 95% language and 96% time suitability. It can be seen that the effectiveness of the game product is 91% with very well developed criteria and the success rate is very successful. Each item includes the item Children are able to read pictures 97%, children are able to say each letter in 1 word 83%, children are able to read words according to audio 96%, children are able to find the same letters 97%, and children are able to say vowels 82% . 3 items have a higher value than the others because early childhood can understand something concrete, including the pictures used in the game are real pictures of pets so that items reading pictures have a high value. In the item reading words according to the audio, the child is guided by the audio repeatedly according to the child's needs by clicking a button, this makes this ability has a high value. In addition, the item finding the same letter has a high value because the child can observe without a time li-

mit until the child finds the same letter. Two other items are lower, namely mentioning each letter in 1 word and finding vowels because the game does not guide specifically like other aspects.

The observed aspects for the development of children's reading skills based on the Rakimahwati instrument which refers to the 2013 curriculum include the ability to read images, mention each letter in 1 word, read words according to audio, find the same vowels and letters. With a sequence of activities for children to read pictures, namely in the form of pictures of pets, children say one by one the letters of a word (pet's name) that have been spelled audio in the game, the child reads the word displayed (audio assisted) in addition to the pictures in the game, the child finds the letters the same thing in the game as in the word "chicken", the same letter is the letter a and the child mentions the vowel aieuo as initial provisions for reading.

## CONCLUSION

The ability to read is a major factor in early childhood intelligence. One of the efforts to improve children's literacy is game applications in the form of interactive games. This research aims to develop an RPG-based interactive game to improve children's reading skills. The method used is ADDIE. The development procedure in this study follows the sequence of activities in the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model. The steps are taken after the product is made, validity test, practicality test and effectiveness test. The results obtained are game products have high validity, namely 94.5% with very valid categories, and 94% practicality with very practical categories. In terms of effectiveness, the success of this game development has been found to increase children's reading ability, which is 91%. Emphasis on the reading aspect includes the ability to read images, mention each letter in 1 word, read the word according to the audio, find the same vowels and letters. Based on 5 effectiveness items, it shows a strong relationship between the aspects of recognizing images, reading words according to audio, finding the same letters to increase early childhood reading skills using interactive RPG games. Two other items are lower, namely mentioning each letter in 1 word and finding vowels because the game does not guide specifically like other aspects.

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