

A Psychological Study on the Impact of Developing Indonesian Language Teaching Materials to Enhance Beginners Reading Ability through "PEBI" Interactive Educational Game

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Abstract

Introduction: all teachers have to face a number of psychologic effects on students which surface problems in their teaching, especially with methodology, and teaching media that have to be used in the teaching process.

Objectives: This study aims to develop Indonesian language teaching materials based method that decrease psychological stress on the interactive educational game "PEBI".

Methods: The Dick and Carey model is used as the basis for the research and development in this work. Students in Serang District's second grade were the topic of this study and development. Quasi-experimental study was conducted with students, and the results were validated by a panel of five experts in the field of learning media. Descriptive statistics are used to inquire into how students feel about the product's advantages and disadvantages, while the t-test is used to assess the product's efficacy. Experts found that the degree of practicality of the generated interactive teaching materials for the Indonesian topic was extremely high (4.50 out of 5, or 90%) across all assessment criteria, including language, presentation, appearance, and usage.

Result: The effectiveness test results showed that Indonesian language teaching materials based on games on Indonesian language subject matter were suitable for use and recommended as learning resources for class II students. The decrease psychological pressures.

Conclusions: Educators to use teaching materials as companion teaching materials in the hope of further improving the creation of teaching materials that follow the conditions of students based on the environment and are created as attractive as possible.

Keywords: Interactive educational, learning media, reading ability

1. Introduction

learning any language has its psychological pressures but in learning Indonesian, four skills must be mastered by students, which include listening, speaking, reading, and writing skills—related to the mastery of these four skills that must be learned by the students gradually (Misnawati et al., 2022). Bearing in mind that reading is something complex, thus achieving fundamental reading skills cannot be separated from internal and external factors students (Zulela et al., 2021).

One of the subjects of learning that students are less interested in and understand is the need for more interest in reading in Indonesian language subjects, and many students find it difficult (Akil et al., 2018; Sari et al., 2020; Wijayanti, 2020). Among them are students needing help connecting letters, making letter sounds, assembling letters into a word, and creating dishes into a sentence (Birch & Fulop, 2020; Ehri, 2014). The cause of difficulty in reading material is understood to be psychologically difficult by the teacher in teaching, namely by using difficult and complicated media in the classroom so that students will feel intimidated bored and bored (Astuti et al., 2019; Derakhshan et al., 2022). So that the expected learning still needs to be achieved (Gacs et al., 2020; He et al., 2016). Therefore, teachers are required to be very clever in finding learning media that

can make it easy for students to understand reading literacy material (Bower et al., 2014; McDougall et al., 2018). The first step in reading to students in elementary schools starts with the preliminary reading (Aqmarina & Cahyani, 2022; Semeraro et al., 2019). According to Tuytens et al. (2021) that learning to read in elementary schools very strategically functions to improve human resources, not only that reading Beginning is the primary capital for students to know the various meanings of the different contents of the subjects studied at school.

Based on data obtained from the Central Statistics Agency (BPS), which has been conducted since 2012, it has been revealed that only 17.66% stated that Indonesian children had an interest in reading. It is categorized as having meager reading interest, not only in March 2016, the Indonesian nation was declared to have ranked 60th out of 61 countries related to reading interest, not only that Indonesia can be said to be at the bottom above Botswana, which ranks 61st in reading interest category. Therefore, it is crucial that teachers have a wide range of abilities to facilitate the process of instruction and learning in the classroom, from the ability to recognise student characteristics, subject characteristics, and environmental conditions, to the ability to select appropriate media, instructional materials, and resources for learning. The quality of the method of instruction and learning is reflected in the students' learning outcomes, hence it is imperative that teachers continually polish these abilities.

Teachers can improve the quality of learning and decrease psychological stress by enhancing the determining factors for the success of a learning program (Dewantara & Kusumastuti, 2020; Surani et al., 2021). The main factors that influence a learning program's success are the material's substance and the structure of the teaching materials contained in the curriculum and syllabus (Lindsey et al., 2021). The curriculum and syllabus are then described as teaching materials (Andrey & Maulana, 2021; Zuzilawati et al., 2021). Improving the quality of learning can be achieved by increasing knowledge about how to design learning methods and media that are more effective, efficient, and attractive (Jahnke, 2023; Tamsah et al., 2021). Efforts in that direction can be made by utilizing learning resources, namely by carrying out the development function in learning through interaction with learning resources (Mishra et al., 2020; Rapanta et al., 2020). Interaction with learning resources needs to be developed systematically and managed properly to achieve learning objectives in a psychological stress free environment (Chatzipanagiotou & Katsarou, 2023; Souabi et al., 2021; Zhong, 2022).

Multimedia-based learning media that can be used in teaching and learning activities, for example, namely educational game-based learning, namely the use of a game as an auxiliary media in carrying out teaching and learning activities (Anohah et al., 2017; Budhayanti & Bata, 2021; Chen, 2021; Fadilla et al., 2020). Educational games are specifically designed and developed to help students learn while playing so that students are still learning even when they are playing (Bressler & Bodzin, 2013; Juniarti et al., 2021; Ke, 2014; Mubin & Budiyanto, 2020). In addition, a game that is played can also help improve students' thinking power and creativity and increase student motivation in storing information (Buckley & Doyle, 2016; Ikhsanuddin & Putri, 2021; Licorish et al., 2018; Wang, 2015). In line with research Tanjung (2019) learning using games can improve achievement. Therefore Anggraeni & Rachmijati (2021), and Izzah (2017), using interactive educational game-based learning media is very motivating.

In the context of education, media refers to any medium used to disseminate ideas and knowledge to students. As a plural version of the Latin word "medium," which in both English and Arabic means "intermediary" or "delivery," the phrase "learning media" originates from the Latin language. The message communicated is the content of the teachings or education in the curriculum (Faturahman, 2018; Lathifah et al., 2021; So, 2016). Sources of messages include teachers, students, other people or book authors. The channel is educational media; the message's recipients are students and teachers. Learning media is important for ongoing learning in the classroom. Hardware and software technologies used in media of communication to clarify information are at the heart of many commonly used learning medium. Moreover, effective instructional materials should inspire students to learn (Abbas et al., 2021; Silalahi et al., 2022). Teaching media is anything that may pique students' interest and motivate them to study, as defined by Kodiyah et al. (2015), Stefani & Samsiyah (2021), and Wahyuni et al. (2020). When seen in this light, both print and digital learning media may be seen as instruments in the service of education.

Practically speaking, the use of educational media in the classroom has the following advantages: (1) it can make abstract topics more concrete; (2) it is also capable of overcoming the limits of time and space limitations; (3) it may circumvent the constraints of the human senses; (4) it can present courses in the form of uncommon

items or events; (5) lesson information offered with the right the media will result in a deep improvement in understanding; (6) it can present knowledge in the form of uncommon objects or events; (6) it can present knowledge in the form of rare items or (Putri & Reinita, 2020; Yudianto, 2017).

Teaching materials are all forms of materials that can be used in carrying out teaching activities, teaching materials in which there are reading materials, display workbooks (LKS), digital materials, food packages, photographs, and cards, and this is very much seen as being able to increase knowledge and experience learners (Ginell et al., 2019; Tursunovich, 2022). Studies in which there are instructional studies in the form of instructional materials (learning materials) which cover all forms of learning such as instructions, books for students, videos, computer-based multimedia formats (Jereb & Šmitek, 2006; Sri & Krishna, 2014). Concerning using computers and technology in learning (Samsuri et al., 2014; Zakaria & Salleh, 2015), teaching materials are also called materials which are usually distinguished

from tools and devices (del Cerro Velázquez & Morales Méndez, 2018; Xue et al., 2019). Equipment is hardware and software used together to create training videos that are stored or exported through the material (Llamas-Nistal & Mikic-Fonte, 2017). A *game* is a structured activity or structured art usually intended for entertainment and sometimes can be used for education (Malone & Lepper, 2021). The characteristics of fun, motivating, addictive and collaborative games make this activity popular (Boyle et al., 2011; Garris et al., 2017; X. Wang et al., 2021). The game is interesting and fun (Al-Azawi et al., 2016; Iten & Petko, 2016). Erfan & Archi Maulyda (2020); Hidayah et al., (2021); Syaifulloh, (2021) divides games into five as follows: The most played style of video game is action. The player's reflexes will be tested in games of this genre. First-person shooters (FPS) are a popular kind of action video game. First-person shooter games test players' mental agility. The developers of this game really put you in that setting. This subgenre of video games blends action with exploration. Players may, for instance, go into caverns, where they must combat opponents and search for old items while also navigating rivers. This subgenre focuses on computerised sports. In most sports video games, the gameplay is designed to be as realistic as possible. Matching coloured balls, solving arithmetic equations, constructing towers, or identifying images are all examples of puzzles found in the puzzle genre; and Word games are often created to evaluate linguistic competence or to investigate the nature of language. Although word games are often played for fun, their educational value has been shown.

2. Objectives

Based on the background above, it is necessary to develop teaching materials in the form of interactive educational games for Indonesian subjects, including initial reading material for grade II elementary school. This research aims to create instructional media teaching materials in the form of interactive educational game-based Indonesian language teaching materials called "BU PEBI". The hope is that it can improve the beginning reading skills of second-grade elementary school students. This study uses two different analyses as a form of novelty from previous researchers: bibliometric analysis using the Vosviewer application to compare prior research related to the same topic and a literature review to ensure extensive knowledge, understanding, and productivity on the matter.

3. Methods

This Research and Development research uses the Dick and Carey Model (Dick et al., 2013). The Dick and Carey model is one of the learning design models with a system approach where the system approach views learning as a set of interconnected parts that all work together towards a predetermined goal. The systems approach to learning is most effective when the learning developer focuses on "what the learner needs to know". The effectiveness of this approach lies in the accuracy of analyzing the learning components in the system.

Therefore this model aims to solve learning problems programmatically with a systematic sequence of activities, which consists of ten stages, namely: First, you'll need to determine what it is you want to teach, then you'll need to conduct an instructional analysis, then you'll need to analyse learning, then you'll need to analyse your students and their environments, then you'll need to formulate performance objectives, then you'll need to create assessment tools, then you'll need to create an instructional strategy, then you'll need to create and select materials, and finally you'll need to design and conduct your lesson.

There are 10 steps to the research process outlined by the Dick and Carey Model. According to Dick & Carey, there are ten steps involved: Learning goals, educational analysis, student and the environment examination, performance objectives, instruments for assessment, instructional strategy, creation and selection

of materials, formative and summative assessments of instruction, curricular adjustments, and evaluation design and implementation. Figure 1 depicts the procedure flow for creating educational resources as described by Dick and Carey.

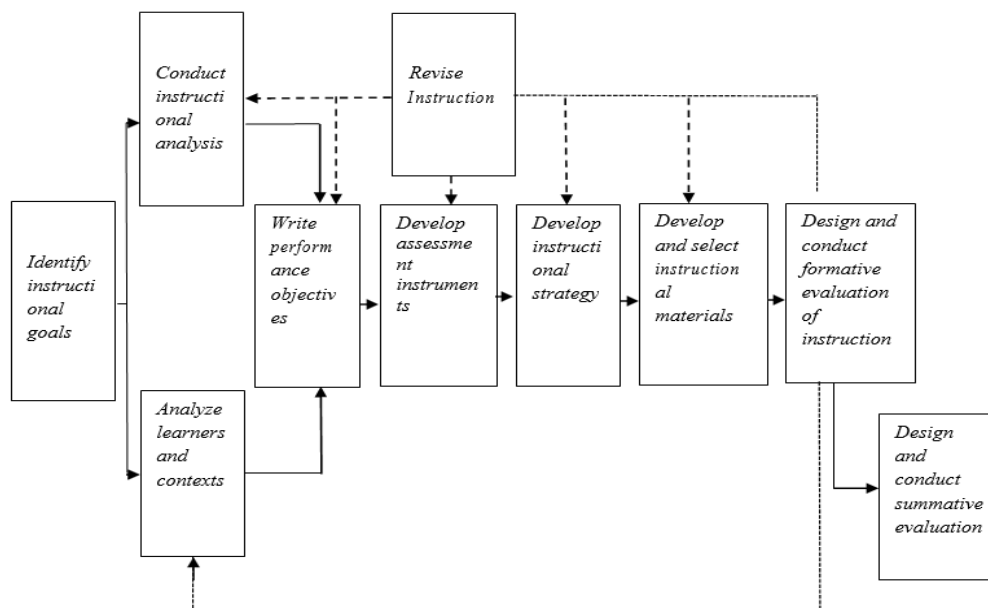


Figure 1. Teaching Material Development Process According to Dick And Carey

The resulting product is tested in full, covering the following stages:

- Review subject content experts to obtain data in the form of assessments, opinions and suggestions on the content of teaching materials
- Expert review of learning materials and learning media, aims to get an assessment of learning materials, including development models, content components and content of learning materials
- Individual trials aim to identify errors in the form of typos and the use of inappropriate language
- Field trials are follow-up trials from individual trials and small group trials. The goal of the exercise is to gauge the level of progress being made in the development of effective educational resources. Students in second grade will benefit from this research on the efficacy of employing interactive educational games to teach the Indonesian language. The study was an experiment, thus the researcher split the sample into two groups: the experimental group and the control group. Where in dividing it, the researcher used students from an experimental class conducted at Ciomas 01 public elementary school, Serang Regency, using ongoing teaching materials developed in a contextual learning process, while students who were in the control class were carried out at the Pasar elementary school, Serang Regency, in learning using theme books 1, 2, 3, and 4 sourced from the Ministry of Education and Culture 6th Revision of 2017 which can be used in learning activities. As with the two classes, the control and experimental classes are equally treated, as in using methods and strategies. A one-group pretest and posttest design (True Experimental Design; Sugiyono, 2015) was utilised in this study. This setup is meant to function as a pre-treatment screening exam. This allows for a more precise assessment of therapy efficacy by comparing post-treatment states with those pre-treatment states. The O1 x O2 configuration is used in this study. O1 is the value taken before treatment (pretest) and O2 is the value taken after treatment (posttest).

The subjects of this research and development were class II elementary school students in Serang District. One of the reasons for the research to determine this subject is based on the results of interviews and pre-research observations showing that students have very low reading skills, they have the same abilities, the geographical location is one sub-district and one district. The test subjects in the development of this teaching material consisted of (a) Subject experts consisting of one subject matter expert, one media (design) expert, and a linguist expert, (b) Individual tryout consisting of 3 students, (c) Small group trials consisting of 8 students, and (d) Field trials consisting of 21 students at Mekar Jaya State Elementary School, Serang Regency. The population is a sample of a larger group from which researchers may make inferences about a specific

phenomenon of interest. Elementary school children from the Serang area participated in the research. Purposive sampling, as opposed to random, regional, or stratified sample, was used to collect the data for this study.

4. Result and Discussion

4.1 Model Design

In product-oriented research and development, this one is analytical, which explains the several product components to be developed and those related to other components. Where this model is very visible is the connection between the concept and the current results. The conceptual model in this research and development is designed with various features and steps as functional stages that can be used or utilized by the user (users) to run and implement digital teaching materials based on interactive educational games. The approach used in the conceptual model in developing game-based digital teaching materials uses the APPPI (Analysis, User, Process, Product, Impact) approach (see figure 2).

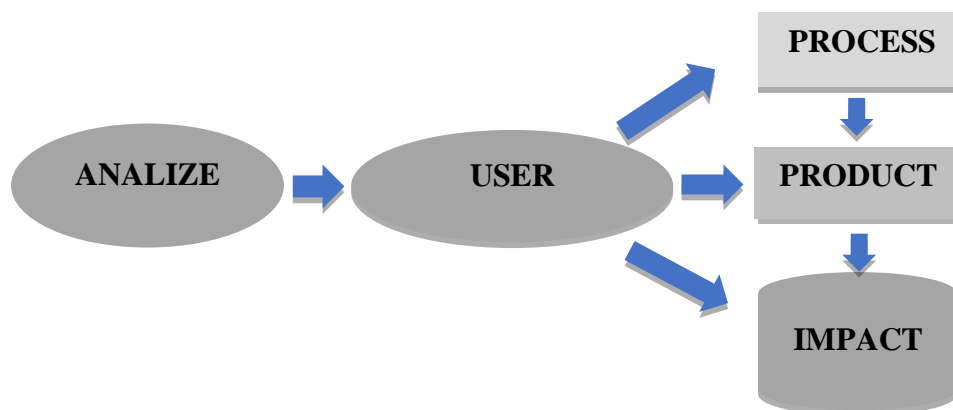


Figure 2. APPPI Model component

Based on the picture above, the conceptual model in this study uses the APPPI model, which stands for analysis, user, process, product and impact. This model shows that there is a relationship or connection between these concepts. Based on the flow obtained, this concept begins with an analysis step starting from the learning device, then carrying out the trial phase against the use and learning process using game-based teaching materials. The next step is the user utilizing it in the learning process so that the results of this utilization are the final hope of the researcher that the process, produce the product and the final impact after using the teaching material product will improve initial reading skills. The approach used in this conceptual model is called the APPPI conceptual model.

Furthermore, the Procedural Model is carried out as a descriptive model that describes the flow or steps in the proper procedure that must be carried out and passed so that it can produce a certain product. The second stage of the development process includes an analysis of Indonesian language learning in class II elementary school thematic books, then followed by the stages of designing teaching materials based on interactive educational games, then the testing stage of experts (media, language, and materials), and the last stage is implementation and evaluation. At this stage, which was carried out in stages, the researcher carried out the stages of analysis starting from needs analysis, goal analysis, learning resource analysis and learning media analysis. In designing the material, the researcher arranges based on the objectives. The process that is carried out involves several experts from the fields of multimedia, education, evaluation, and language. Compiling digital teaching materials based on interactive educational games is principally the researcher providing game methods that contain elements of education and learning so that with these elements, the resulting products can be used and utilized for learning processes that can improve reading in grade II elementary school children (see Figure 3).

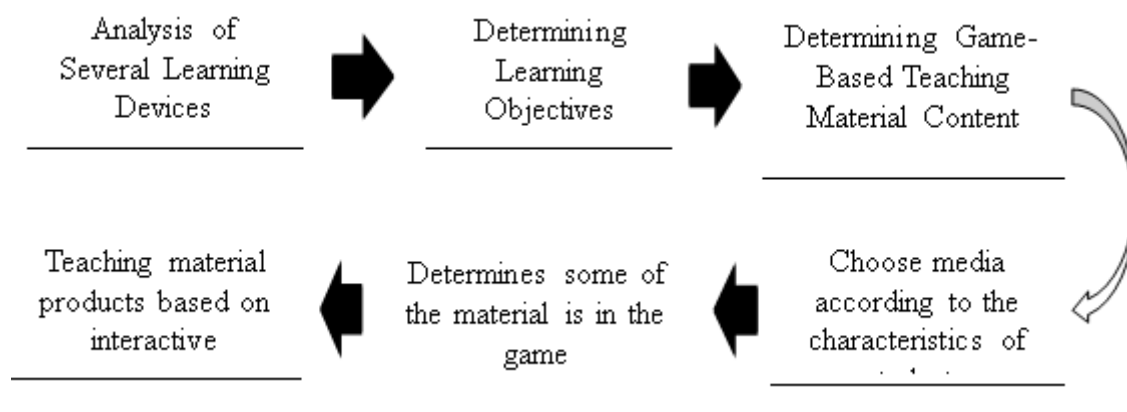


Figure 3. Design Development Stages

After the needs analysis process, the design developed in making prototype games through small, medium and large-scale trials. There are improvements and refinements, validation by material experts, linguists and media experts, and implementation to the user (students as users and teachers as executors). Then the prototype results obtained in interactive educational games (PEBI) can be explained in the PEBI prototype display, which is listed in the attachment to this article (see attachment 1).

4.2 Description of the Results of Expert Assessment of Teaching Materials

Product development results are in the form of teaching materials that have been tested for theoretical and empirical feasibility. In the feasibility process, several steps (stages) are carried out, starting with the Expert Test, one-to-one Test, Small group Test (Small group) and finally, the extensive group test, often called the Field Test. Then the researchers conducted a feasibility test starting with media experts, linguists and material experts, so that from several experts determined the product of this development was in the form of Indonesian language teaching materials based on interactive educational games to improve early reading skills in Class II Elementary Schools in Serang District. Researchers in developing this product used a qualitative descriptive method, which is an in-depth method of how facts, reality and symptoms in the most appropriate method of using how effective the use of game-based Indonesian language teaching materials is to improve beginning reading skills in grade II elementary school students. The results of the draft teaching materials have been made in the form of prototypes. The next step is for the researchers to carry out the testing, repair and refinement stages and then immediately validate by experts starting from material experts, linguists and media experts.

1) Material Expert Validation Results

Teaching materials and learning tools have been developed by researchers and validated by several experts. This validation test aims to produce teaching materials and learning tools that are good and feasible to use. Indonesian language teaching materials and learning tools in this study will be validated by validators consisting of linguists, material experts, and content experts. The average results of material expert testing can be seen in table 1.

Table 1. Average Material Expert Validation Results

| No | Validator | Indicators | | | | Amount | Avg | % |
|----|--------------------------|----------------------|-------------------|------------------|-----------------|--------|------|------|
| | | Material suitability | Material accuracy | Material support | Material update | | | |
| 1 | Dr. Helaluddin, M.Pd | 15 | 34 | 24 | 19 | 92 | 4.84 | 97% |
| 2 | Dr, Gusti Yarmi, M. Pd | 13 | 30 | 24 | 18 | 85 | 4.47 | 89% |
| 3 | Prof. Dr. Sugiono, M. Pd | 13 | 32 | 19 | 19 | 83 | 4.37 | 87 % |

Based on the table above, there are indicators at the material expert assessment stage, including the suitability of materials, accuracy of materials, material support, and material updates. This stage is one of the

stages of evaluating game-based Indonesian teaching materials given to competent experts in their respective fields. Seeing the results of the assessment of game-based teaching materials as a whole produces an average value of 4.82 for the first validator, the second validator average value is 4.47, and the average validator value is 3.47 with the "Good" criterion.

2) Media Expert Validation Results

There are several indicators in the assessment of media experts, including presentation design, use of interaction, accessibility and feedback. The media expert's assessment results will use as a barometer for revising teaching materials before testing in the field. The method used by the developer in generating this data is to provide a questionnaire. In this way, the researcher can get the assessment results and input or suggestions from the developer to provide a solution as a revision of the teaching materials being developed (see Table 2).

| No | Validator | Indicators | | | | Amount | Avg | % |
|----|------------------------------|------------|-----------------|---------------|----------|--------|------|-----|
| | | Design | Interaction use | Accessibility | Feedback | | | |
| 1 | Dr.Uwes Anis Chaerumaen | 45 | 19 | 24 | 4 | 92 | 4.84 | 88% |
| 2 | Dr.IkaLestari,M.Si | 50 | 23 | 24 | 5 | 102 | 4.85 | 97% |
| 3 | Dr H. Eko Wahyu Wibowo, M.Si | 45 | 22 | 23 | 5 | 95 | 4.52 | 90% |
| 4 | Prof.Dr.H.SholehHidayat.M.Pd | 41 | 16 | 21 | 5 | 83 | 3.95 | 79% |
| 5 | Dr.Lukmannul Hakim | 45 | 25 | 24 | 5 | 99 | 4.71 | 94% |

Table 2. Average Media Expert Validation Results

Based on the results of the media expert's evaluation of game-based teaching materials, it can be seen from the table above that the average product assessment results produce an average value of 4.7. With this categorized rating "Good".

3) Linguist Validation Results

Assessment on the linguist questionnaire conducted by Dr.Anindtya Sri Nugraheni, M.Pd, as a lecturer in Indonesian at Yogyakarta State University (UNY), where the aspects assessed include several indicators including straightforward, communicative, interactive, conformity with student development and suitability of language rules and the use of the term symbol or icon. Looking at the aspects of the five indicators, the results of data from linguists are as follows:

| Validator | Indicators | | | | | Amount | Avg | % |
|----------------------------------|------------------|---------------|-------------|---|----------------------------------|--------|-----|-----|
| | straight forward | communicative | interactive | Suitabilitywiththedevelopmentofstudents | ConformitywiththeRulesofLanguage | | | |
| Dr. Anindtya Sri Nugraheni, M.Pd | 14 | 10 | 10 | 9 | 9 | 61 | 4,6 | 94% |

Table 3. Linguist Validation Results

From the data above, the developer describes that based on the average assessment results, it produces 4.6, where this data is a category of eligibility which assumes "Good" from the percentage of linguists based on the table above achieving a feasibility of 94%, so it is categorized as "very good".

4.3 Data Analysis Gain Beginning Reading Ability

The increase (gain score) in the results of reading ability is the difference in the test scores before the treatment (pretest) and after the treatment (posttest). In this case, the goal is to determine effectiveness, and the next step is to use the N-Gain calculation test. This test was carried out in the experimental class. Gain data is used to determine whether the increase in reading ability of experimental class students after receiving treatment is better than the increase in reading ability of the control class without using game-based teaching materials so

that the N-Gain value. Descriptive statistics from the gain score data for the experimental class and the control class are presented (see Table 4).

| | Amounts of students | Average Gain score | Standard deviation |
|------------|---------------------|--------------------|--------------------|
| Experiment | 30 | 0,6624 | 0,2409 |
| Control | 30 | 0,4008 | 0,3461 |

Table 4.Data Gain Descriptive Statistics

Compared to the control group, whose average gain score is 0.4008, the experimental group's 0.648 score places it well within the moderate range and is more than acceptable. The following are the steps in judging whether or not pupils' reading comprehension has improved.

1) Gain Data Normality Test

To check if the Gain data from both samples were regularly distributed, a normality test was performed. Parametric statistics are used in the event of a normal distribution. However, nonparametric statistics are used in the absence of a normal data distribution. Table 4.5 displays the results of the normalcy test.

Tests of Normality

| | Kolmogorov-Smirnov ^a | | | Shapiro-Wilk | | |
|--------|---------------------------------|----|-------------------|--------------|----|------|
| | Statistic | df | Sig. | Statistic | df | Sig. |
| GAIN_K | .143 | 30 | .118 | .949 | 30 | .161 |
| GAIN_E | .119 | 30 | .200 [*] | .947 | 30 | .143 |

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Table 5. Test of Normality

The table above shows that the significance of the two data gains for the control and experimental classes is 0.118 and 0.200, which means more than 0.05, then Ho is accepted. It can be concluded that both control and experimental class gain data come from normally distributed populations.

2) Test the difference in average data gain

Gain data has met the requirements to perform a parametric test that is normally distributed. The test to be used is the independent t-test with a significance level of 0.05. This independent t-test was conducted to find out whether the increase in reading ability of the experimental class students after obtaining a better score than the increase in reading ability of the control class, which obtained a lower score than the experimental class (see Table 6).

Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality | | | |
|--------|-----------------------------|---|------|---------------------|--------|-----------------|-----------------|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference |
| N_GAIN | Equal variances assumed | 4.497 | .038 | -3.397 | 58 | .001 | -.2615604 |
| | Equal variances not assumed | | | -3.397 | 51.757 | .001 | -.2615604 |

Table 6. t result

Based on the table above Sig 0.38, information is obtained that Sig. < 0.05, then Ho is rejected, and this shows that the increase in reading ability of the experimental class students after receiving treatment is better than the increase in reading ability of the control class. Based on the table of independent test results, Sig Lavenes Test For Equality Of Variance is 0.686 > 0.05, and the data's variance is homogeneous. This leads the

researcher to the conclusion that the t-test shown in the Equal Variances Assumed output table generated by SPSS 23 is an independent t-test. H_0 is rejected but H_a is accepted in the separate sample t-test since the researcher knows the Sig (2-tailed) result is 0.005 0.05 from the output table. In other words, when comparing the average learning results of students in courses using game-based Indonesian instructional resources to those in classrooms not using game-based Indonesian teaching materials, there is a substantial difference.

5. Discussion

The product developed by the researcher is interactive educational game-based teaching material known as PEBI, which has been revised based on individual and small group trials. The results of field trials conducted on 30 Class II students at SDN Mekar Jaya, Serang Regency, gave a positive response to using the "PEBI" Interactive Educational Game as a learning medium. By looking at the results of the questionnaire answers and comments from 30 students, it can be said that the Interactive Educational Game "PEBI" has an attractive appearance and is more practical than books in physical form. Students are motivated to read because the Interactive Educational Game "PEBI" has the advantage of playing it directly with the help of an android. So, students can access deeper information if students still need additional information. Based on the results of field trials, the validation results for calculating the average percentage of Indonesian Language Teaching Materials Based on Interactive Educational Games "PEBI" is 93%. Excellent qualification; no need to revise, and Excellent qualification, no revision needed.

From the results of the recapitulation of student answers, a percentage of 89% obtain for individual trials, 97% for small group trials and 93% for field trials, so the opinion can obtain that the material in game-based teaching materials developed by researchers can foster students' interest in reading, while at the same time improving the reading ability of elementary school children because of its attractive appearance and different from textbooks. Students also think that the interactive educational game "PEBI" is more efficient because you do not have to buy expensive textbooks, and it is practical because it is easy to carry and can download on an Android device that is connected to the internet so that it can be read anywhere via a Smart Phone. Testing the efficacy of game-based Indonesian language instruction tools to enhance the beginning reading abilities of second-grade primary school pupils, researchers conducted individual trials, small-group testing, and field tests. As such, this procedure for testing the equipment is crucial for establishing its reliability.

The average score from the initial results (pretest) is 53.57, and the highest average score is 84.20. Based on the percentage of completeness in the pretest, which is 3.3%, 96.7 students did not complete the completeness in individual learning based on value-based criteria, namely achieving a maximum score of 73 on the post-test score, getting a score of 100. The increase (gain score) in the results of reading ability is the difference in the test scores before the treatment (pretest) and after the treatment (post-test). In this case, the goal is to determine effectiveness, and the next step is to use the N-Gain calculation test. The experimental group conducted the evaluation. The experimental group had an average gain score of 0.648, which includes the moderate and very successful categories, whereas the control group had a score of 0.4008. Here are the measures that may be used to see whether children have improved their reading comprehension. Average learning results varied significantly across classrooms using game-based Indonesian language resources and those not using game-based Indonesian material on this exam.

Based on the effectiveness test results, Indonesian language teaching materials based on games on Indonesian language subject matter are suitable for use and recommended as learning resources for class II students. In connection with the limited time in conducting research and development, this study has areas for improvement, limitations, and strengths.

a. Lack

- 1) The implementation of trials conducted by researchers is still minimal, and there are still many shortcomings;
- 2) Limitations in uploading applications on Playstore;
- 3) There are still a few things that could be improved with the features being developed due to the limitations of the existing programs;
- 4) The scope of game material is still limited to only gathering three essential competencies;
- 5) Game instructions are straightforward;
- 6) Scores and game levels are still limited; when it is finished, you can move on to the next;
- 7) For further development, it is necessary to improve with content and context and users that are easy to access in game-based teaching materials.

b. Excess

1) This teaching material has attractiveness in terms of animation, images and sound; 2) The material presented is easy to understand according to relevant pictures; 3) Can foster student learning motivation; and 4) Can be developed again with the addition of material and features for advanced material.

6. Conclusion

Based on data from the research and development of teaching materials based on interactive educational games, or what is known as PEBI, to improve the reading ability of class II public elementary schools in Serang Regency. So, the following conclusions are obtained:

Prototypes of game-based teaching materials were developed by carrying out several stages, namely starting from needs analysis and collecting research data obtained from preliminary studies. The design stage of these teaching materials was developed based on curriculum analysis and student characteristics and then made through programming, flowcharts, and storyboards. This teaching material has been validated by two material expert reviewers, one language expert and five media experts. The design of this teaching material was then tested, starting from individual trials, small scale and field trials (large scale). Prototypes that have been repaired and perfected are then validated by material, media and language experts so that the results are feasible for use or tested with several suggestions. The results of several trial and validation steps, the next step is to implement the product by obtaining an increase in reading ability through test instruments (pre-test and post-test). This teaching material has been successfully validated, revised and evaluated.

In both controlled and uncontrolled experimental settings, game-based learning materials have been shown to be successful. The homogeneity test indicates a statistically significant contrast between the two tests. It demonstrates the practicability and efficacy of the instructional material in enhancing students' reading abilities in Elementary School Grade 2. It's great for relieving tension and easing the emotional toll on pupils.

Seeing the results described above, the development of Indonesian language teaching materials has the following implications:

Game-based Indonesian language teaching materials based on the results of development in Indonesian language subjects that integrate with the thematics are appropriate for use as learning resources in Indonesian language learning with this test, starting from individuals, small groups and field tests, it can see that the results of the trials There is clarity, attractiveness and enjoyment of students in using the developed teaching materials. Educators are expected to be able to use teaching materials as companion teaching materials in the hope of further improving the creation of teaching materials that follow the conditions of students based on the environment and are created as attractive as possible

Researchers need to provide suggestions for developing game-based teaching materials. Furthermore, the activity or research process could be better, so this still needs to be developed by subsequent researchers in order to produce better products and obtain optimal results. The implementation of modern technology is essential to support the advancement of science and technology in the future. Seeing his enthusiasm towards transmigrating the 2013 curriculum to the Pancasila curriculum or the independent curriculum can make it possible to develop teaching materials more linked to real life for students. The hope is to get learning that can change in a better direction so that learning will become more meaningful.

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