Development of Dam-Daman Learning Media on Flat Shape Material to Improve Learning Outcomes of Class III Elementary Schools in Tasikmalaya

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Abstract
This study aims to develop a dam-daman learning media on flat shape material to improve learning outcomes for third grade elementary school students in Tasikmalaya. Aims to find out how the development of dam-daman learning media on flat material and determine the effectiveness of dam-daman learning media on flat material. The method used is the R&D (Research and Development) Borg and Gall method with seven stages. The sample used was simple random sampling technique from the entire population of 4 elementary schools and the samples in this study were class III students consisting of 6 students at SDN Sindangsari INP as a small group trial, 12 students at SDN Condong as a large group trial. and 27 students as an effectiveness test at SDN 2 Cileuleus. Instruments for collecting data by observation, interviews and validation instrument questionnaires (validation of media, language, material and questions). Quantitative and qualitative data analysis techniques from the results of the feasibility and effectiveness tests. Based on the results of the research, we have obtained a dam-daman learning media on flat shape material. This dam-daman learning media for elementary school students of class III flat shapes has very good criteria in terms of media, language, material and student responses. Based on the feasibility test by experts and student responses in the form of scores, where the validation results of media experts got a score of 3.63, linguists at 4.00, material experts at 4.00 and student responses at 3.55. Then the results of the effectiveness test in the control class got an N-Gain score of 0.1 with low criteria and the results of the control class got a score of 0.7 with high criteria. Therefore using dam-daman media can certainly improve student learning outcomes. However, this is inseparable from the need for further research because this study tested the effectiveness of an elementary school in the Cisayong sub-district.
Keywords: Learning Media, Dam-daman, Flat Shape Material, Learning Outcomes of Elementary School Students

INTRODUCTION

Education is learning, knowledge, skills and habits of a group of people passed down from one generation to the next through teaching, training and research. Education often takes place under the guidance of others, but is also possible on a self-taught basis. Etymologically the word education itself comes from the Latin ducare, which means "to guide, direct or lead". On the other hand education also means the activity of "leading out". Any experience that has a formative effect on the way people think, feel, or act can be considered educational. The classification for education itself is generally divided into several stages such as preschool, elementary school, junior high school, high school, and then college, university or apprenticeship.

Seeing the phenomena that occurred in 2018 The Organization Economic Co-operation and Development (OECD) collected the results of the Program for International Student

Assessment (PISA) survey, Indonesia received an unsatisfactory rating like the PISA results in previous years, this was based on surveys and data published by the OECD for the period 2009 to 2015 Indonesia was ranked in the bottom 10, which means that scores were almost always below average. While the results of the PISA survey in 2018, Indonesia ranks 74th, which is ranked 6th from the bottom. Judging from mathematical abilities, Indonesia got 379 and was in position 73 (Ramesyah, 2020).

Seeing the phenomena that occur as explained above, that education in Indonesia is very concerning because looking at the PISA ranking, especially in mathematics, it is ranked 73. Why is the quality of education in Indonesia bad/low until now, there are several factors that cause low quality education, namely one of which can be seen from the shackled education system, namely in the 4.0 era, the main source of teaching and learning should not only be the teacher, but the teacher as a companion for students with other learning resources, not fixated on one source. So with that, students must become more active and learn by using learning resources that are outside the school that can guide students in understanding a lesson and in accordance with their interests and talents. Therefore, teachers in teaching and learning must be more creative so as to encourage students to be more active in learning. As explained by Milah Nurkamilah (Nugraha, et. Al), that "Elementary school is the first level of education in learning mathematics, the quality of learning mathematics in elementary schools will provide additional reinforcement to children about how to interpret mathematics in everyday life".

By conducting interviews with several schools in Tasikmalaya, namely Sindangsari INP Elementary School, Cileuleus Elementary School, Cileuleus 2 Elementary School and Condong Elementary School, to find out the problems that are in the school that the results of the interviews conducted by researchers are that student learning outcomes are still below the KKM in subjects mathematics and the use of media during learning, teachers rarely use the media, especially in mathematics lessons. This is due to limitations in making learning media so that not all lessons use media.

In mathematics, which has quite a broad scope, of course, media is needed as a means of conveying material, making it easier to understand the material, improving learning outcomes and having a good impact on learning outcomes. Then we need interactive learning media as a learning tool that is used by teachers/facilitators when conveying subject matter. Atmaji, 2019:330). Besides that, the benefits of this checkers game include being able to train brain intelligence and train someone to take risks on the path they choose (Afandi et al., 2022). Based on the explanation that has been presented above, which is considered the right solution to improve student learning outcomes by developing learning media dam-daman on flat shape material to improve student learning outcomes.

RESEARCH METHODS

The type of research used is research and development (Research and Development). R&D is a type of research that produces a product not a theory and is used to improve certain products to produce effective products. According to Brog & Gall (1983) that research and development is a process used to develop or validate products used in learning (Silalahi, 2018:2) Meanwhile According to Sugiyono, (2019:30) research and development methods (Research and development) is a method used to research, design, produce, and test the validity of a product that has been developed.

The research design that will be used by researchers is according to what has been stated by Borg and Gall in Sukmadinata (2017: 169-170) that there are 10 steps in preparing the development method, namely as follows: 1) Research and data collection, 2) Planning, 3) Initial product development, 4) Initial field trials, 5) Preliminary Revisions, 6) Main field trials, 7)

Product Revisions, 8) Operational field trials, 9) Final product revisions, 10) Product dissemination and implementation. However, at this research stage it only reached the 7th stage, namely the product revision stage, namely to produce learning media dam-daman on flat shape material to improve the learning outcomes of third grade elementary school students. This research and development does not reach the final stage and for the operational field test stage until the mass production of the product can be carried out in further research.

The development of this design involved the assessment of experts prior to conducting the main field trials, so that the learning media developed had been revised based on the assessment, input and suggestions of experts. Media expert validation, conducted by Mohammad Fahmi Nugraha, M.Pd. The linguist was conducted by Anggia Suci Pratiwi, M.Pd, and the material expert was conducted by Ulfa Nurfadilah, S.Pd as the class teacher. Then a small group trial was carried out on 6 students at SDN Sindangsari INP and a large group test on 12 students at SDN Condong. After conducting the initial field trials, the main field trials were conducted on 27 students of SDN 2 Cileuleus by dividing into two groups, namely 13 students as the control class and 14 students as the experimental class.

RESEARCH RESULTS AND DISCUSSION
Research Result

In determining the location for the initial field test, the researcher used a simple random sampling technique, namely for the small group test at Sindangsari INP Elementary School and the large group test at Condong Elementary School. To find out the results of the feasibility test of dam-daman learning media, it is measured using the following formula:

$$\overline{X} = \frac{\sum x}{N}$$

Information:
$\overline{X}$ = Average value
$\sum x$ = Total score for each aspect
N = Number of questions

With the following conditions:

Table 1. Due Diligence Test Provisions

Average Score	Category Classification
$3{,}25 \leq \overline{X} \leq 4{,}00$	Very good
$2{,}50 \leq \overline{X} \leq 3{,}25$	Good
$1{,}75 \leq \overline{X} \leq 2{,}50$	Not enough
$1{,}00 \leq \overline{X} \leq 1{,}75$	Very less

(Source: Eko Putro Widoyoko in Nurlaila et al., 2017:46)

Then to validate the pretest and posttest questions using the following formula:

$$M \frac{\sum xi}{\sum n} \, x100\%$$

Information:
M = Assessment Percentage
$\sum xi$ = Total score obtained
$\sum n$ = Total Score

With the following conditions:

Table 2. Problem Validation Provisions

Score	Category
85% - 100%	Very Valid
75% - 84%	Valid
65% - 74%	Valid Enough
55% - 64%	Invalid
0 - 54%	Invalid

(Source: Sugiyono 2015 in (Budayasa, 2022:80)

The following are the results of the expert validation test as follows:

Table 3. Media Expert Validation Results

No	Aspect	Question Items	Average Score	Category	Valuation Statement
1.	Efficiency	4	3,25	Very good	Worthy
2.	Appearance	3	4,00	Very good	Worthy
3.	Benefit	4	3,75	Very good	Worthy
	Total	**11**	**3,63**	**Very good**	**Worthy**

Table 4. Linguist Validation Results

No	Aspect	Question Items	Average Score	Category	Valuation Statement
1.	Language Used	5	4.00	Very good	Worthy

Table 5. Material Expert Validation Results

No	Aspect	Question Items	Average Score	Category	Valuation Statement
1.	Format	3	4.00	Very good	Worthy
2.	Fill	6	4.00	Very good	Worthy
3.	Benefit	3	4.00	Very good	Worthy
	Total	**12**	**4,00**	**Very good**	**Worthly**

Based on the results of research conducted by media experts, when viewed from the aspect of efficiency, a score of 3.25 is obtained, which is in the very good category. Then seen from the display aspect, it gets a score of 4.00, which is a very good category. Then seen from the aspect of the benefits of getting a score of 3.75, namely getting a very good category. Then the results of the validation carried out by linguists show that from the aspect of the language used in the learning media Dam-daman gets a score of 4.00, namely getting a very good category and is suitable for use and the results of the validation carried out by material experts actually seen from the format aspect gets a score of 4, 00 which is very good category. Then from the content aspect, a score of 4.00 is obtained, which is in the very good category. Then seen from the aspect of the benefits of getting a score of 4.00, namely getting a very good category. Therefore the developed media can be used and is feasible to be tested and the results of the validation of test items conducted on several experts show that the questions used at the pretest and posttest stages have very valid values with several improvements. So the questions used for the pretest and posttest stages are feasible to use. Then the results of the small and large group trials are shown in the following table:

Table 6. Small Group Trial Results

No	Aspect	Average Score	Category
1.	Interest to learn	3,33	Very good
2.	Use	3,83	Very good
3.	Appearance	3,75	Very good
	Total	**3,55**	**Very good**

Table 7. Large Group Trial Results

No	Aspect	Average Score	Category
1.	Interest to learn	3,91	Very good
2.	Use	4,00	Very good
3.	Appearance	3,79	Very good
Total		**3,88**	**Very good**

The results of the small group trials obtained an average score of 3.33 on the aspect of learning interest, 3.83 on the aspect of use and obtained a score of 3.75 on the display aspect. So it can be concluded that each aspect gets a very good category and the results of the large group trial get an average score from the aspect of learning interest reaching a score of 3.91, which is included in the very good category, the usage reaches a score of 4.00, which is included in the very category. good and in the display aspect it achieves a score of 3.79 which is included in the very good category.

In testing the effectiveness, the N-Gain test was carried out, which was to test the difference in mean pretest and posttest after using dam-daman learning media in class III SDN 2 Cileuleus. The following is the N-Gain formula, namely:

$$g = \frac{skor\ posttest - skor\ pretest}{skor\ ideal - skor\ pretest}$$

With the following conditions:

Table 8. Provisions for Effectiveness Test Instruments

Limitation	Kategori
g ≥ 0,7	High
0,3 ≤ g ≤ 0,7	Currently
g ≤ 0,3	Low

(Source: Meltzer in Ramdhani et al., 2020:164)

The results of the main field test aim to determine the effectiveness of dam-daman learning media when used in the learning process. In testing the effectiveness, the N-Gain test was carried out, which was to test the difference in mean pretest and posttest after using dam-daman learning media in class III SDN 2 Cileuleus. As for the results of the main field test that the learning activities carried out in the control class obtained an N-Gain score of -0.1, namely getting a low criterion. based on the results of the N-Gain score that the pretest got an average score of 43.1 and the posttest got an average score of 45.4 and in the experimental class actually the learning activities carried out for the experimental class got an N-Gain score of 0.7, namely getting high criteria. based on the results of the N-Gain score that the pretest got an average score of 44.3 and the posttest got an average score of 80.7.

Discussion

Based on the results of the research, as a whole from the development of learning media dam-daman on flat shape material in class III SD. The results obtained by the researcher are a dam-daman learning media which contains flat shape material in elementary schools. Dam-daman is a traditional game in Indonesia which is starting to become extinct so that at this time many children do not know about the game of checkers. Therefore the researchers dig up information about traditional dam-daman games so that they can make a media that can make it easier for children to increase their knowledge at school.

The results of the research and data collection resulted in the fact that learning media, especially in mathematics lessons, was lacking, so that students did not understand the subject

matter conveyed by the teacher. In the traditional checkers game developed is a modification of a traditional desktop-based game into a learning media on flat shape material. The uniqueness of this dam-daman learning media can make students active and creative by setting strategies in playing games and can increase knowledge and improve student learning outcomes in mathematics, especially in flat shape material in elementary schools. The researcher combines traditional checkers and puzzles to make a learning media that is interesting and easy to use in the learning process by paying attention to aspects of suitability, effectiveness and benefits through the results of observations in the field.

The feasibility of dam-daman learning media is obtained from the results of due diligence data by experts, namely media, language, material and student responses. The results of the feasibility test of media experts are based on the results that are known, that dam-daman learning media is very good. When viewed from every aspect, Dam-Daman learning media has aspects of efficiency, appearance and benefits that are very good and worthy of being tested. Then the results of the feasibility of linguists based on the results are known, that the language used in the learning media and the aspects of the language used in the learning media is very good and feasible to use. Then the results of the feasibility of material experts are based on the known results of the material presented in the learning media dam-daman when viewed from several aspects, namely the format, content and benefits are very good and in accordance with the flat shape material so that students can be active and creative during the learning process.

Then the results of student response assessment data are based on the results obtained, that learning media dam-daman on the aspect of interest in learning can increase student interest in learning, in the aspect of using learning media it is very easy to use and in terms of appearance it is very good and interesting to use so that from the results of student responses it is said that by using dam-daman learning media it can be used in the learning process.

The effectiveness test was carried out on 31 students of SDN 2 Cileuleus by dividing into two classes, namely the control class of 13 students and the experimental class of 14 students. Based on the results of the control class, it was found that learning without using media resulted in the pretest and posttest when viewed from the average score, namely the pretest got an average score of 43.1 and the posttest got an average score of 45.4. Therefore it is calculated that N-Gain gets a low category, namely a score of -0.1. Therefore the control class was declared ineffective.

Then the results of the experimental class, that learning using dam-daman learning media, was produced in the pretest and posttest when viewed from the average score, namely the pretest got an average score of 44.3 and the posttest got an average score of 80.7. Therefore it is calculated that N-Gain gets a high category, namely a score of 0.7. Therefore it can be concluded that using dam-daman learning media can improve student learning outcomes in flat shape material. Based on this fact that in the development of dam-daman learning media which aims to improve the learning outcomes of third grade elementary school students in flat shape material, the results get an increase compared to without using the media. The limitations of the researcher are that the products developed have a heavy weight because the materials used are wood and plywood and the results obtained are those carried out in the Cisayong sub-district area. So that if it is done in a different place, it is likely that the potential differences will be obtained.

CONCLUSION

Based on the results of the study it was concluded that, the results of the development of dam-daman learning media were carried out based on the traditional dam-daman game media by making several modifications, namely the pieces of dam-daman were made into puzzles with wooden materials and there were question cards (DAMTAR) that could connect media with

learning and the results of the due diligence conducted from the results of the initial field tests at elementary schools, namely SDN Sindangsari INP and SDN Condong. Obtain a learning media that is appropriate and appropriate for use, by testing media experts, language, material and student responses, with the feasibility results of the media expert getting a score of 3.63 very good category, linguist getting a score of 4.00 very good category, expert material 4.00 very good category and student response got 3.88 very good category and the results of the effectiveness test conducted from the results of the main field test at SDN 2 Cileuleus, obtained from the results of the pretest got an average score of 44.3 and the posttest got a score average 80.7. Then the N-Gain is calculated with a result of 0.7 in the high category, so that dam-daman learning media is effectively used to improve the learning outcomes of third grade elementary school students in flat shape material.

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