

Development of Education Games Map Material as a Learning Media for Elementary School Students

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Abstract

The purpose of this study is to describe the development needs and characteristics of education games learning media based on the perceptions of teachers and students, compile and validate education games learning media and test the effectiveness of learning education learning media at Public Elementary School Jatibarang Lor 02. The type of research used is research and development. These stages of research and development include potential problems, product manufacturing, product validation, product revisions, and product trials. Based on the results of the needs analysis, it can be concluded that the development of learning education learning media is in accordance with the characteristics of teachers and students including material aspects, presentation aspects, linguistic aspects, and graphic aspects. These characteristics are developed into education games learning media products that are ready for expert validation testing. Based on the validation test, education games learning media got a score of 84 with good categories. After going through expert validation tests, then the learning media is tested on students. The results showed that education games learning media were effective and could improve cognitive learning outcomes and skills of students at Public Elementary School Jatibarang Lor 02. So, it can be concluded that this education games learning media became one of the solutions in learning elementary school students, especially on map material.

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INTRODUCTION

The curriculum applied in Brebes Regency is the 2013 curriculum. In the curriculum, directing teachers to be more creative and innovative in learning activities. It is possible for teaching and learning activities between students and teachers to be more active, and students more easily absorb learning material.

The learning process activities according to Hasyim (2014) is a process that contains a series of actions by teachers and students on the basis of reciprocal relationships that take place in educational situations to achieve certain goals. Teaching is a form of activity in which there is a relationship of interaction in the learning and teaching process between educational staff and students. Training is almost the same as teaching but is more about developing certain skills.

The results of preliminary observations regarding the learning process of social science education in class IV showed that, so far, the teacher used learning media in the form of textbooks and worksheets on map material. Learning activities take place with students working on the questions in the book and taking notes from the teacher in front of the class. This shows that the teacher has not been able to maximize the learning media, so the teacher needs interactive learning media.

Media according to Mahnun (2012) is a means of channeling messages or learning information to be conveyed by the message source to the target or recipient of the message. Learning media can be used by teachers in teaching and learning activities. This is in line with the opinion of Falahudin (2014) that the use of learning media in teaching and learning activities can generate new interests and desires, generate motivation and stimulate learning activities, and even bring psychological influence to the learner. Thus the learning media that are less than optimal in the implementation of teaching and learning activities can affect the learning outcomes of their students.

According to Bloom as quoted by Sudjana (2010) classifies the types of learning outcomes into 3 namely (1) types of cognitive learning

outcomes, (2) types of learning outcomes affective fields, and (3) types of learning psychomotor fields. Assessment of learning outcomes from class IV social science education is carried out thoroughly, namely cognitive, affective and psychomotor. Cognitive learning outcomes are closely related to thinking abilities, and affective learning outcomes include behavioral traits, while psychomotor learning outcomes are related to physical activity. Achieving the objectives to be achieved in the three aspects of learning outcomes must appear as student learning outcomes in school.

The reality in the field shows that the assessment of the learning outcomes of social science education in Public Elementary School Jatibarang Lor 02 is mostly done on cognitive aspects, while the assessment of affective and psychomotor aspects has not been carried out optimally. Assessment of attitudes and skills has not been fully implemented by the teacher, so the assessment is still cognitive in general. In addition, the results of studying social science education in class IV are still low.

The material of the map in this study focused on learning social science education class IV, Theme 8, Sub-theme 1 on the Environment of Residence. Basic competencies (KD) in the learning are KD 3.3 and KD 4.3. KD 3.3 contains the understanding of humans in relation to the geographical conditions in their surroundings and KD 4.3 contains about telling people in relation to the geographical environment in which they live. Basic competencies can be achieved by students through learning material maps with indicators to be achieved, among others: being able to explain the state of nature in Indonesia and explain the impact of the situation with the population.

Learning the theme of the living environment requires interactive learning media. Education games are expected to be one of the learning media for students in understanding map material. Education games are games that contain subject matter so that students can better understand the lesson with high learning motivation through playing while learning. This educational game is an educational tool that is

educational. One example of educational games that can affect social skills for students is traditional games (Nugraha, Handoyo, and Sulistyorini, 2018).

Educational game tools are one of the media or facilities that can stimulate student activities to learn a learning material and can increase understanding of something, both using advanced technology and simple technology. This technology is used as an educational tool that provides opportunities to increase the desire for learning and behavior in students (Hermina, and Nurfi, 2010). This desire can be illustrated by students' cognitive and psychomotor.

The functions of educational games include the following:

1. Providing knowledge to children through the learning process of playing while learning.
2. Stimulating the development of thinking power, creativity and language, in order to grow attitudes, mentality and good morals.
3. Creating an attractive playing environment, providing a sense of security and fun.
4. Improve the quality of children's learning.

Educational games used in this study are Puzzle type media. The puzzle is a game of composing an image or object that has been broken down in several parts. Puzzles are included in games that contain associative activities connecting or coupling. The task of the player is to rearrange or rearrange a random system.

The puzzle media uses images to communicate with students. According to Sanaky (2010), the advantages of the picture include the following:

1. The concrete picture is more realism, showing the main problems when compared to verbal ones,
2. Images can overcome space and time, meaning that not all objects, object objects can be taken to class and learners can carry the object,
3. Images can overcome the limitations of the five senses,
4. Clarify a problem presentation in any field and for any age level,

5. This media is cheaper, easier to get and use without the need for special tools.

In addition, images also have weaknesses in their use, these weaknesses include the following:

1. More emphasis on the sensory perception of the eye,
2. Objects are too complex, less effective for learning,
3. Size is very limited for limited groups,
4. Must be authentic means that the image must honestly describe the situation,
5. Simple, the composition should be clear enough to point out the main points in the picture,
6. The size is relative, not too big or too small, but according to needs,
7. The image shows an activity, activities, or certain actions,
8. Good pictures do not necessarily reach the learning goals.

This research is expected to help solve problems for students and teachers related to learning media, so students no longer encounter difficulties in map material. In addition, teachers are expected to be able to provide information about innovative and creative education games so that they can be utilized in learning activities.

METHODS

This research and development method uses the research design proposed by Sugiyono (2010). The stages of this study include: (1) potential problems, namely activities to identify education media learning needs of teachers and students, (2) product development, namely the activity of composing education games learning media developed based on the needs of teachers and students, (3) product validation, namely the activity of validating learning media products for education games from several experts, (4) product revisions, namely activities to revise products based on suggestions from validators, (5) product testing, which is an activity to test the education games learning media for students in Public Elementary School Jatibarang Lor 2.

The population in this study were all fourth-grade students, Public Elementary School Jatibarang Lor 02 Jatibarang Subdistrict, Brebes Regency. Sampling in this study uses cluster random sampling. Sampling used by researchers is a population that has its own group characteristics. The group in this study were all fourth-grade students, Public Elementary School Jatibarang Lor 02. Sampling was randomly assigned to determine the experimental class and the control class.

RESULTS AND DISCUSSION

This study obtained the results of (1) the needs and characteristics of the development of education games learning media based on the perceptions of teachers and students, (2) drafts and results of expert validation tests on the development of education games learning media, (3) the effectiveness of education games learning media for elementary students.

Results of Needs Analysis and Characteristics of Learning Media Development

The results of the analysis of the needs of teachers and students on education games learning media on map material produce characteristics of the development of learning media. These characteristics include four aspects, namely material aspects, presentation aspects, linguistic aspects, and graphic aspects. To be more complete, these four aspects will be explained as follows:

1. Material Aspects

Teachers and students in the material aspects want the material delivered to be complete, including the understanding, functions, types, elements, and requirements of the map. In addition, so that students easily understand the material, in the material, must be explained briefly, densely, and clearly. For a sample, material maps are more devoted to the province. Learning media education games are more specialized in media puzzles.

2. Presentation Aspects

The characteristics of students and teachers in the aspect of presenting education games learning media are more desirable to be sorted in accordance with the scientific approach. In addition, for the presentation of teacher and student evaluations requires a sequence of theories, examples, exercises, and finally the competency test. Then the presentation of education games learning media is reproduced and shared with each student. The display of learning media is presented in an interesting and easy way to be implemented in puzzle learning media. Making it easy for students to discuss and cooperate with other friends in one group.

3. Language Aspects

Characteristics of teachers and students on the desired aspects of language, namely the writing of letters and punctuation in accordance with the Indonesian Spelling (EBI). Selection of the right words and terms that are easy for students to understand. The sentence used is effective, straightforward and unambiguous. Communicative learning makes students more active. The choice of words used also uses terms that are easily understood by students. In addition, the use of language in learning media is communicative.

4. Graphical aspects

Characteristics of graphic aspects that are desired by the teacher and students are in the form of a title that has a right and left layout. Font used times new romance. The scale used in the media is quite representative of the level of detail of the image. Bright and striking map color composition. Writing legends must be detailed. The image, size, and composition of the map color are appropriate. Materials made make the media suitable and easily presented to students.

Draft Media Learning Education Games and Expert Validation Test

Draft learning media for education games are developed based on the needs and characteristics of teachers and students. Characteristics of teachers and students want

educational games in the form of puzzles. To be more clear about the draft education games learning media, see the following Figure 1.



Figure 1. Draft Learning Media Education Games with Puzzles

After the draft media learning is arranged, the next is an expert validation test. Expert validation tests consist of media experts and media experts. It was assessed in the form of aspects, namely material aspects, presentation aspects, language aspects, and graphics aspects. Based on the expert validation test, it can be concluded that the development of the education games learning media is categorized as good with a score of 84. For more details, see Table 1 below.

Table 1. Expert Validation Test Results

Aspect	Total score	Criteria
Material	74	Good
Presentation	83	Good
Language	87	Very good
Graphical	90	Very good
Average	84	Good

The Effectiveness of Education Games Learning Media for Elementary Students

After going through the validation test stage and obtaining good criteria, then the effectiveness of education games learning media products is carried out. The effectiveness test is carried out for class IV students, Public Elementary School Jatibarang Lor 2 by dividing the control class in IVA and the experimental class on IVB. In both classes the effectiveness test according to cognitive learning outcomes and skills will be taken.

Cognitive learning outcomes in the control class at IVA can be seen in Table 2 below.

Table 2. Cognitive Learning Outcomes of Control Class Students (IVA)

Value range	Category	The number of students Control class (IVA)
85 – 100	Very good	0
75 – 84	Good	1
65 – 74	Adequate	5
00 – 64	Less	20
Total		26

Based on the data in Table 2 it can be concluded that cognitive learning outcomes in the control class (IVA) carried out using books and worksheet are the lowest scores of 30 and the highest score of 80. From these data, it can be seen that there are 25 students who have not yet finished learning. This is evidenced by the achievement of cognitive values between the range 75-84 as many as 1 students, 65-74 as many as 5 students and 00-64 as many as 20 students.

Furthermore, cognitive learning outcomes in the experimental class on IVB can be seen in Table 3 below.

Table 3. Cognitive Learning Outcomes of Experimental Class Students (IVB)

Value range	Category	The number of students Experimental class (IVB)
85 – 100	Very good	10
75 – 84	Good	6
65 – 74	Adequate	8
00 – 64	Less	2
Total		26

Based on Table 3, it can be concluded that cognitive learning outcomes in the experiment (IVB) carried out using education games learning media is the lowest score of 55 and the highest score of 95. From these data, it can be seen that there are 10 students who have not yet finished learning. This is evidenced by the achievement of cognitive values between the range 85-100 as many as 10 students, 75-84 as many as 6 students, 65-74 as many as 8 students and 00-64 as many as 2 students.

The value of students' skills in the control class at IVA can be seen in Table 4 below.

Table 4. Values of Skills Control Class Students (IVA)

Value range	Category	The number of students Control class (IVA)
85 – 100	Very good	1
75 – 84	Good	2
65 – 74	Adequate	7
00 – 64	Less	16
Total		26

Based on the data in Table 4 it can be concluded that the value of skills in the control class (IVA) carried out using books and worksheets is the lowest score of 40 and the highest score of 90. From these data, it can be seen that there are 23 students who have not yet finished learning. This is evidenced by the achievement of skills between the range 85-100 as many as 1 student, 75-84 as many as 2 students, 65-74 as many as 7 students and 00-64 as many as 16 students.

The value of students' skills in the experimental class on IVB can be seen in Table 5 below.

Table 5. Values of Skills Experimental Class Students (IVB)

Value range	Category	The number of students Experimental class (IVB)
85 – 100	Very good	8
75 – 84	Good	11
65 – 74	Adequate	6
00 – 64	Less	1
Total		26

Based on the data in Table 5, it can be concluded that the value of skills in the experimental class (IVB) carried out using education games learning media is the lowest score of 60 and the highest score of 100. From

these data, it can be seen that there are 7 students who have not yet finished learning. This is evidenced by the achievement of cognitive values between the range 85-100 as many as 8 students, 75-84 as many as 11 students, 65-74 as many as 6 students and 00-64 as many as 1 student.

After getting scores on students' cognitive results and student skills, the next is testing the effectiveness of education games learning media through a table of independent sample tests. The results of these tests can be seen in Table 6 below.

Based on Table 6 it can be seen that from the cognitive results of the control class students and experiments with the sig value = 0.000 < 0.05. This means that H_0 is rejected, meaning that there is a difference between the experimental group and the control group. Therefore, it is said that the education games learning media can improve students' abilities towards cognitive learning outcomes. So, education games learning media are effective and acceptable.

The results of testing the effectiveness of students' skills in the control class at IVA and IVB experimental class can be seen with a table of independent sample test. The results of these tests can be seen in Table 7 below.

Based on Table 7 it can be seen that the sig value. = 0.000 < 0.05. This means that H_0 is rejected, meaning that there is a difference between the experimental group and the control group. Therefore, it is said that the education games learning media can improve students' abilities towards student skills. So, education games learning media are effective and acceptable.

Table 6. Results of Student Cognitive Learning Effectiveness

		F	Sig.	t	df	Sig. (2-tailed)
Learning outcomes	Equal variances assumed	.711	.403	-7.043	50	.000
	Equal variances not assumed			-7.043	48.065	.000

Table 7. Test Results for the Effectiveness of Student Skills

		F	Sig.	t	df	Sig. (2-tailed)
Skills	Equal variances assumed	.654	.422	-6.217	50	.000
	Equal variances not assumed			-6.217	49.140	.000

The use of educational games learning media in the learning process depends on the creation and initiative of the instructor. Creativity

can develop well towards the optimal point is supported by two main factors, namely the environment, facilities, and infrastructure.

A good environment in the process of developing creativity can deliver creative human beings. Through play, children get lessons that contain aspects of cognitive, social, emotional and physical development. Likewise with a teacher. The teacher must be able to grow his creativity. One example is that the teacher can use something in the environment as a creative learning media. Suarno (2015) stated that learning media must demand the creation of the teacher so that the learning process can be fun. For example with education games learning media. Through the activity of playing with various forms of play, children are stimulated to develop toward the totality of personality.

Games as learning media involve students in the process of experience and experience challenges, get inspired, are encouraged to be creative and interact in the activities of fellow students in playing games. Each student performs the same game, but the inner process of each student can vary. The inner process can be seen by the form of words and behavior to understand the process of developing students' potential. Games are facts that are analyzed to understand behavior through experience. According to Dananjaya (2010), people learn from experience through the stages of doing, expressing, analyzing, concluding and applying.

Learning is the activity of individuals acquiring knowledge, behavior, and skills by way of processing learning materials. The learning process is not always effective and efficient and the results of teaching and learning are not always optimal, because there are a number of obstacles. A good way of learning shows efficient learning to meet the set time, is able to take notes, or read, is ready to learn, has learning skills, and supports parents. Learning difficulties can be overcome by setting clear goals and learning goals, avoiding negative suggestions and criticisms, and creating a competitive learning atmosphere.

Cognitive and psychomotor learning outcomes in students can be said to increase with the education games. In line with Ramasyah (2015); Budiyanto, Widjanarko, and Pramono (2014) that educational games can provide interesting learning alternatives. So that the

cognitive abilities and skills of students will increase. In line with that, Fahmi (2016); Pratama, and Haryanto (2017) also said that educational games can improve students' knowledge. Students' knowledge and skills in learning maps can be demonstrated in learning. This shows that learning education learning media is a learning process for students who need a stage to do, express, analyze, conclude and apply map material in learning activities.

The learning process in map material needs an innovative review of learning media. Therefore it is necessary to develop learning media. Media that can be developed as learning namely maps media (Muzakki, and Endro, 2014). Thus, the learning objectives in map material can be fulfilled. Both of students' cognitive results and student skills. Therefore, there is continuity between material map and learning media. Both must run simultaneously to the fullest. One of the learning media that can be utilized is the media puzzle. According to Saifullah, Pargito, and Darsono (2013); Maududi, Purwanto, and Awalya (2018), Puzzle map media has proven to be more effectively applied in map material compared to conventional map media. In order for students to achieve completeness in map material, the teacher must integrate with learning media that are interesting, innovative, and creative. The completeness of the map material is determined from the learning media used, namely the media puzzle. Therefore the media puzzle is strongly recommended to be applied to the map material (Naemah, Indri, and Umar, 2017).

CONCLUSION

Based on the results of the study it can be concluded that the development of educational games learning media has been adjusted to the perceptions of elementary school teachers and students. So that these perceptions are generated from the characteristics of the learning media needed. After the learning media has been developed, the next stage is the expert validation test stage. Validation test consists of material expert validation test and validation test of

learning media experts. From some of these experts, this learning media obtained a score in a good category. After that, learning media was tested on students of Public Elementary School Jatibarang 2. There are two classes tested, namely the experimental class (IVB) and the control class (IVA). Based on the effectiveness test on the independent samples test table, it can be concluded that the education games learning media on map material are suitable to be used in Public Elementary School Jatibarang 02. Education games on map material have an effect on significantly improving student learning outcomes both from students' cognitive outcomes and student skills.

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