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BUILD SPACE LEARNING MEDIA INNOVATION CUBE AND BEAMS

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ABSTRACT

Based on observations made in the wake of material math learning space, found a tedious learning process, learners are not active, the method used monotonous and unattractive instructional media, and therefore contributes to the understanding of the material. Thus the researchers aim to produce instructional media such as wake-up room is equipped with an image of objects around the expected with the media learners do not feel bored and active in learning and better understand the material got up space, determine the feasibility of the product, know the response of the students to the product produced. The research conducted is research the development of R & D (Research and Development). Results from these studies is the acquisition of the results of validation of materials experts 95.67%, 86.67% of media experts, and the acquisition of the validation results linguists 91.30% of the validation results of this third entry in the media very worthy qualification does not need to be revised. Thus, the product is fit for use as a learning medium grade elementary school mathematics. Based on the results of the acquisition of the response of learners to answer "positive" get a percentage of 99% and an answer "negative" 1%. From these results it can be concluded that the simulation instructional learning media geometrical get a positive response from the students and can be used as a learning medium grade elementary school mathematics.

Keywords: Innovation, Media Learning, Teaching Mathematics, Build Space.

1. INTRODUCTION

Learning mathematics by Hudoyo (1979: 108) is the process of building or constructing concepts and principles, not just learning that seem passive and static, but the mathematics learning should be active and dynamic. This is consistent with the view konstruktivitis is a view in teaching learning where learners construct their own meaning from experience and interaction with others, while teachers act provide meaningful experiences for learners (Sukayati, 2003: 1). According to Piaget (Monks et al, 2004: 221) learners aged 4 to 7 years are still thinking of concrete pre-operational means to understand a concept the students still have to be given the activities associated with real objects or real events that make sense.

Reviewing of the explanation above, in order to improve the effectiveness of learning mathematics researchers conducted observations in class V SDN 1 Klepu. Based on observations made mathematics learning information obtained beginning with the greeting, prayer and presence. Followed by the teacher explaining material geometrical volume in the book. Then the teacher gives an example of geometrical volume of material workmanship. After that the teacher gives learners the opportunity to ask questions, but none of the students who ask questions. Teacher asks students to cooperate with your seatmate to do the exercises in the book, during the discussion of learners seem crowded.

Finish work on the problems, teachers and learners discuss the problems, there are still many students who answered incorrectly.

Learning mathematics in class V SDN 1 Klepu only from the textbook Mathematics class V SD and book LKS, as well as instructional media use only those images that are in the textbook and worksheets, the learning method used by the teacher is lecturing course , so the interest in learning mathematics learners in class V SDN 1 Klepu still lacking. Based on these activities and cooperation of the level of activity is still low, professor of applied learning strategies and making learners monotonous boredom while following the lesson, learning media less attractive, and the level of ability of learners to understand the material is still lacking. Therefore, to improve the quality of mathematics learning in school one using interesting learning media.

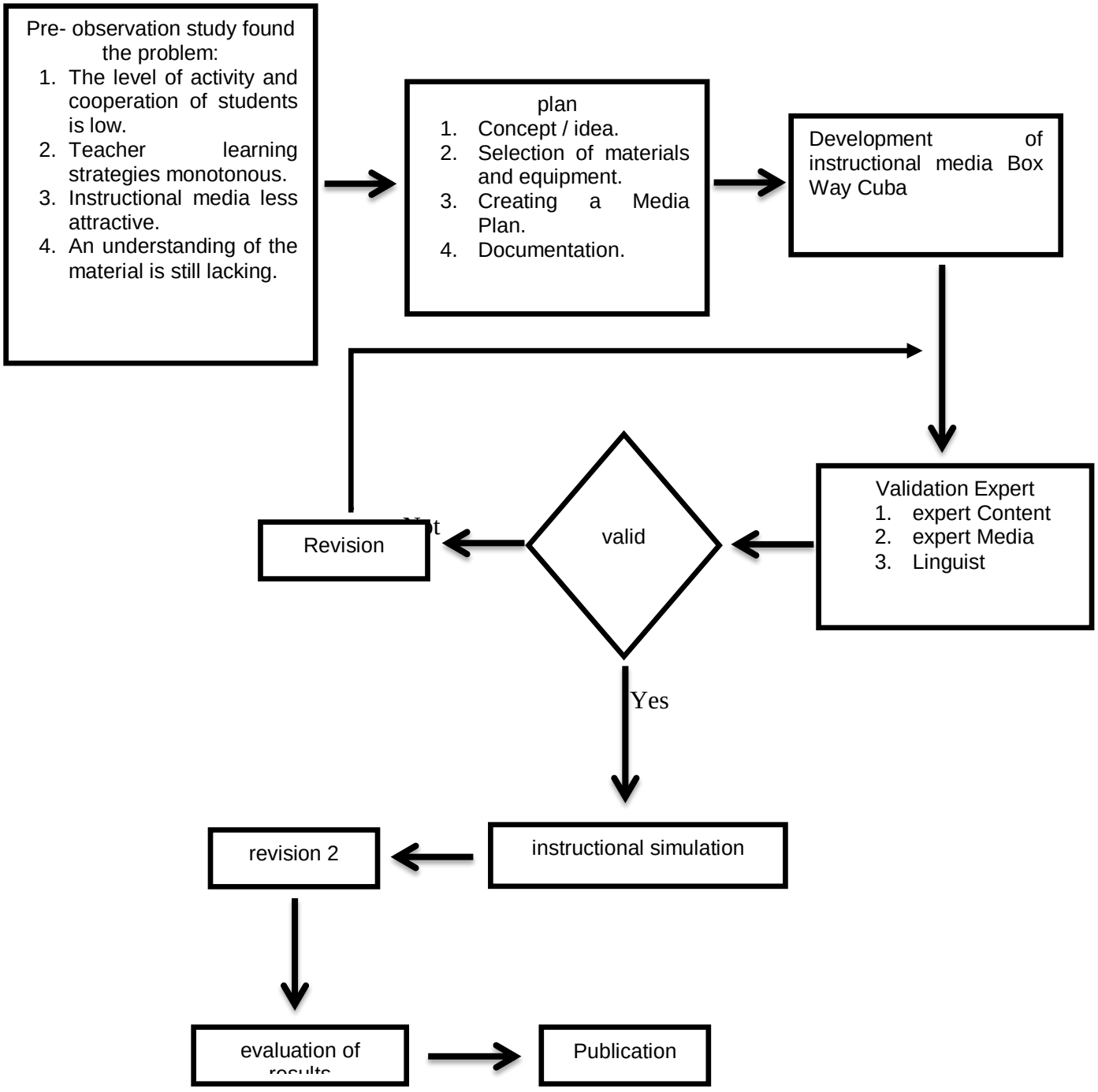
Thus, researchers are trying to innovate to develop the media in accordance with the material needs and learners, the learning media geometrical pictorial objects around, is expected by the learning media that can provide solutions to problems that occur, can produce effective learning, optimal , as well as providing new innovation to students and teachers, and to promote academic qualifications and maximum results for learners and teachers.

Research relevant to this study is the research conducted by Wahyuni and Yayuk (2010), in a study entitled "Utilization of Waste Materials as Instructional Media for Increasing Understanding of properties Build Space in Learning Mathematics Learners Class V SDN Bocek 02 District of Karangploso District unfortunate ", stated in his research that the geometrical mathematics learning materials by utilizing the thrift as a learning medium managed to improve students understanding of the material get up space. Learning to use the media used goods can enhance the activity and motivation of learners in the learning process.

Excess research conducted by Wahyuni and Yayuk is media pembelajran utilization of thrift being able to complete the learning outcomes of more than 80% of learners in mathematics instruction, learners experience an increase in understanding the properties of geometrical and media learning was easy to find and does not require much cost. Shortage of research conducted by Wahyuni and Yayuk is learning media used in groups, so sometimes there are learners who are not really familiar with the material got up space. The development of the media to be the researcher doing research Wahyuni and Yayuk is a medium that will be created for each learner not to groups so hopes learners thoroughly familiar with the material got up space,

2. METHODOLOGY

In this study the type of research is Research Development or (Research and Development).According toBorg and Gall(1989),*educational research and development is a process used to develop and validate educational product*, Meaning that research educational development (R & D) is*a process used to develop and validate a product of education*, According toSugiyono (2009: 5) said that research and development aiming to discover, develop and validate a product. While the approach of the study is to combine qualitative and quantitative approaches. Framework and research procedures exist in the following scheme.



Scheme 1 framework and research procedures

Framework and research procedures can be described as follows:

The initial activity of observation carried out prior to the study, this activity aims to determine any problems faced by the students and teacher in fifth grade elementary school mathematics. Further planning of media design, media design at the planning stage begins with the discovery of a problem at the time of observation of this problem researchers can

determine media design planning stage. After the manufacture of cubes and blocks is completed, the stage should be done is to validate the product for teachers, as well as media expert lecturers, materials and languages, this activity aims to obtain comments and suggestions about the media cubes and blocks to be tested. Subsequently revised, at this stage we make improvements media cubes and blocks based on the results of the validation experts to the media can be tested as well. Once the revision is completed the next stage is simulated instructional done on learners at SDN 1, then after teachers and students to learn mathematics with media cubes and blocks, it will measure how far the response of students to the use of media cubes and blocks through a questionnaire responses learners. The next stage is the revision 2, at this stage we make improvements media based on the analysis and suggestions obtained in instructional simulation. After completing the revision of the next stage is an evaluation conducted to assess the quality of products and processes in the manufacture of products that have been conducted by researchers, both before and after the trial. The final stage is the publication, at this stage of the process media disseminate treasure cubes and blocks.

While the approach of the study is to combine qualitative and quantitative approaches. Research and development conducted by individual researchers. The technical analysis of the data in the study of this development as follows:

a) Analysis of questionnaire data validation

Validation questionnaire given to the experts or the validator. Answer a questionnaire to experts using a Likert scale, measured variables are translated into the indicator variables. Likert scale used consisted of a score of 1 to score 5. After the questionnaire validated by a validator, then the questionnaire will be analyzed and dipersentase. According Sugiyono (2015: 134-135) while the category scores on the Likert scale described in the following table:

Table 1 Category ratings on Likert scale

No.	Score	Information
1	5	Very good
2	4	Well
3	3	Pretty good
4	2	Not good
5	1	Very Poor Good

Obtaining validator research data analyzed by the following formula (Sugiyono, 2015: 418):

Percentage score $=\frac{JumlahSkorPenilaian}{SkorPenilainmaksimal}$ x 100%

Percentage obtained is then converted into qualitative data as in table 3.6 below:

Table 2 Quantitative Data Conversion

No.	level of Achievement	Qualification	Information
1	81% - 100%	Very good	Very decent, do not need to be revised
2	61% - 80%	Well	Decent, do not need to be revised
3	41% - 60%	Pretty good	Less worthy needs to be revised
4	21% - 40%	Not good	Not worth it need to be revised
5	<20%	Very Poor Good	Very decent, need to be revised

Source: (Sugiyono. 2015: 418)

Based on table 3.6, if the validation shows the percentage is less than 60%, the product is declared less feasible for use in the learning process. Conversely, if the result of the response of learners and product trials show the percentage of more than 61% then the product received a positive response from the validator and may be eligible for use as a learning support materials wake elementary school classrooms.

b) Questionnaire responses learners

The analysis obtained from class V learners response to the media's Treasure Cube and Beams. Those results were analyzed to determine the attractiveness of the media Treasure Cube and Beams. Rating the attractiveness of data using Guttman scale. Guttman scale is a scale of measurement to form a firm answer as "yes-no", "right-wrong", "never-never", and others - others. Forms of assessment using a checklist with a choice of "yes - no". Guttman scale measurement category is in Table 3 as follows:

Table 3 Categories with Guttman scale the attractiveness ratings

No.	Score	Information
1	1	Yes
2	0	Not

Acquisition of learners research data analyzed by the following formula (Sugiyono, 2015: 418):

Percentage score = $\frac{JumlahSkorPenilaian}{SkorPenilainmaksimal}$ x 100%

Table 4 Qualification level of achievement learner response

No.	level of Achievement	Information
1	6-10	Positive
2	0-5	Negative

The population in this study is the overall grade V learners drawn from one school SDN 1 Klepu by the number of learners 26. The samples in this study using the technique

of saturated samples by using all learners to research conducted at SDN 1 Klepu by the number of samples as many as 26 students.

3. RESULTS AND DISCUSSION

The steps used in producing instructional media researcher wake room, first look for material on the geometrical volume on the book of learners, teachers books, rpp and mathematics syllabus, as well as consult with classroom teachers SDN 1 Klepu. Both chose the concept of media, at this stage the researchers made an abstract form of media cubes and blocks

Equipment and materials used in the manufacture of cubes and blocks pembekajaran media are pencils, rulers, scissors and cutter, glue, printer, cardboard, styrofoam slabs, old cardboard, paint, and masking tape. Creating a Media Plan

The steps to create a treasure cubes and blocks, which is the first equipment and materials are required, the second cut cardboard with scissors / cutter to form webs of cubes and blocks of various sizes, the third to give the image of objects around on webs of cubes and blocks , fourth forming webs of cubes and blocks into cubes and blocks pasting with glue, fifth gluing styrofoam that have been measured and cut to the size of the cube and the beam on all sections, the sixth media cubes and blocks that have been completed included in the treasure chest, media ready to be tested.

To determine the feasibility of researchers to validate media products three times by subject matter experts, media specialists, and linguists. The following graph the average percentage gain of the three validation has been done.

Table 5 Results of the validation

Results Validation	Average Percentage Validation Expert			Criteria	Criticism and suggestions
	Matter	Media	Language		
1	68.3%	68%	65,3%	Well	Needs improvement
2	69.67%	74%	65,3%	Well	Needs improvement
3	95.67%	86.67%	91.3%	Very good	Media ready to be tested

Based on the qualification achievement validation results in Table 5 it can be concluded that the media geometrical pictorial objects sekitardapat declared eligible for each phase of the validation increased scores and at the validation stage the third gain excellent qualifications of each expert to study media are suitable for use in metematika teaching fifth grade elementary school. The following chart to determine the increase at each stage of validation:

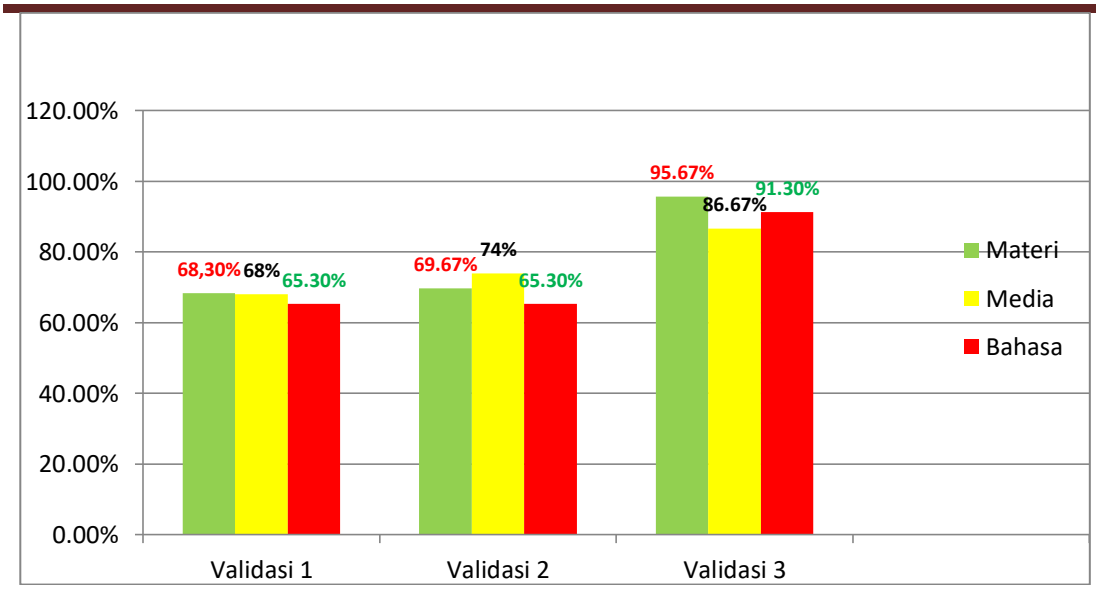


Figure 1 The results of the validation

Based on the chart 1 validation results first acquisition of 68.30% subject matter experts, media specialists 68%, 65.3% and linguists. Earned stage 2 validation result there is an increase of 69.67% matter experts and media specialists 74%, but the results of linguists remained 65.30%. Validation Phase 3 also increased acquisition results of validation of materials experts 95.67%, 86.67% of media experts, and the acquisition of the validation results linguists 91.30% of the three results of this validation wake media pictorial space objects around in qualifying very decent does not need to be revised. Therefore, based on the validation results show that the media wake pictorial space objects suitable for use in learning about math class V SD.

To investigate the response of students to the products, the researchers tested the media to learners and learners share the questionnaire responses to determine how the learners to simulate the response of instructional media treasure cubes and blocks. Here is a diagram of the results of the questionnaire learners:

Table 6 Results of the response of learners

respondents	Results Response Students	Criticism, comments, and suggestions
respondent 1	13	I am pleased with this media
respondents 2	13	I am pleased with this media
respondent 3	13	I am pleased with this media
respondents 4	13	I am pleased with this media
respondents 5	13	With this medium I better understand the material presented
respondents 6	13	I am pleased with this media
respondents 7	13	I am pleased with this media

respondents 8	13	I am pleased with this media
respondents 9	12	I like
respondents 10	12	I like
respondents 11	13	I am pleased with this media
respondents 12	13	I am pleased with this media
respondents 13	13	I am pleased with this media
respondents 14	13	I am pleased with this media
respondents 15	13	I am pleased with this media
respondents 16	13	I am pleased with this media
respondents 17	13	I am pleased with this media
respondents 18	13	I am pleased with this media
respondents 19	13	I am pleased with this media
respondents 20	13	I am pleased with this media
respondents 21	13	I am pleased with this media
respondents 22	13	I am pleased with this media
respondents 23	13	I am pleased with this media
respondents 24	13	This media draw
respondents 25	13	I am pleased with this media
respondents 26	13	I am pleased with this media
Total score	336	
percentage Score	99%	

Based on the results of questionnaires learners in Table 6 was obtained percentage of 99%, which means the media treasure cubes and blocks to get a positive response from students. From the data results of the questionnaire can be concluded that the media wake pictorial space around objects effectively used to study elementary mathematics. The following chart to determine the response of learners terhada the learning media:

Graph 2 Responses learners

Based on the results of the acquisition of the response graph 2 learners to answer "positive" get a percentage of 99% and an answer "negative" 1%. From these results it can be concluded that the simulation instructional media wake pictorial space objects around to get a positive response from the students and can be used as a learning medium grade elementary school mathematics.

4. CONCLUSION

Based on media development wake pictorial space objects sekitaruntuk fifth grade elementary mathematics, it can be concluded as follows:

Based on the results of the validation results first acquisition of 68.30% subject matter experts, media specialists 68%, 65.3% and linguists. Earned stage 2 validation result there is an increase of 69.67% matter experts and media specialists 74%, but the results of linguists remained 65.30%. Validation Phase 3 also increased acquisition results of validation of materials experts 95.67%, 86.67% of media experts, and the acquisition of the validation results linguists 91.30% of the three results of this validation wake media pictorial space objects About a rmasuk in qualifying very decent does not need to be revised. Thus, the wake-up product display space objects sekitarlayak used as a learning medium grade elementary school mathematics.

Based on the results of the acquisition of the response of learners acquire 99% the percentage of positive responses. From these results it can be concluded that the simulation instructional media wake pictorial space objects around to get a positive response from the students and can be used as a learning medium grade elementary school mathematics.

5. SUGGESTIONS

So that the resulting product development researcher at the fifth grade elementary math learning can be fully utilized, it needs to be given some suggestions related to, among others:

1. For learners

   Researchers expect the products developed can be used as a medium of learning support mathematics fifth grade elementary geometrical material so as to increase the interest of learners.
2. for teachers

   The researcher expects teachers can further develop this product so that the product is maximum utilization.
3. For other researchers

   Researchers expect that other researchers can develop learning products more varied and interesting for fifth grade math learning elementary geometrical material.

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