

The Development of Problem Based Video Media on Matter Building to Improve Students' Achievement in Grade V SDN 101874 Batang Kuis

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Abstract : *The purpose of this research is to know: (1) validity media of problem-based learning video on mathematics learning at SDN 101874 Batang Kuis. (2) the feasibility of problem-based learning media on mathematics learning at SDN 101874 Batang Kuis; and (3) effectiveness of problem-based learning video media on mathematics learning at SDN 101874 Batang Kuis. The subjects of this study are the students of grade V SDN 101874 Batang Kuis with a total of 30 students. As the object of research is the development of problem-based learning videos on the mathematics lesson of building a flat. The type of this research is development research using the development model used is Thiagarajan model with Four-D (Model 4-D). The research instruments are expert opinion questionnaire, student response questionnaire, teacher response questionnaire, and student learning test instrument. The research findings show: (1) valid problem-based learning video used in mathematics learning at SDN 101874 Batang Kuis, (2) problem-based learning video suitable for use in mathematics learning at SDN 101874 Batang Kuis, 3) problem-based learning videos are effectively used in mathematics learning at SDN 101874 Batang Kuis.*

Keywords – *development of learning videos, mathematics learning outcomes*

I. INTRODUCTION

The advancement of science and technology is growing rapidly and its impact touches to all aspects of the field of human life, and one of them is the field of education. Changes that are challenges and problems must be positively anticipated. The development of science and technology adds to the insight of thinking and impacts on the change of activity in learning. Of course, the development and changes that occur should get the attention of all parties for the next generation of the nation able to follow the development and change it. Efforts to improve the quality of education have been done by the government such as curriculum renewal, improvement of educational facilities and infrastructure, the use of teaching methods, conducting research and improving the quality and quantity of teaching materials. But the number of efforts made by the government to this day still many critics who say that the quality of education in Indonesia is still low.

Mathematics lesson is one of the auxiliary science that is very important and useful in everyday life or in supporting the development of science and technology. Mathematics is a means of thinking to cultivate a logical, systematic, objective, critical and rational mindset that must be nurtured since primary education. Therefore, mathematics must be able to be one means to improve students' reasoning power and can improve the ability to face the challenges of everyday life. Abdurrahman argues that mathematics should be taught to students because it is always used in all aspects of life, all fields of study require appropriate mathematical skills, is a powerful communication tool, short and clear, can be used to present information in various ways, ability to think logically, thoroughness, and awareness, spatial, and give satisfaction to the effort to solve challenging problems [1]. Thus the learning of mathematics has the aim to form students' thinking ability which is reflected through the ability of critical thinking, logical, systematic, and have an objective attitude, honest, discipline, in solving problems in the field of mathematics and other fields in daily life.

Furthermore Rusfendi argued that the functioning of mathematics lessons as a means of forming the mindset of students can be measured from the ability or skill possessed by students in the mastery of mathematics subject matter or often called mathematical proficiency (Mathematical Proficiency) [2]. Among the mathematics skills are the skills and abilities of students in problem solving, especially the ability in solving math problems. Kilpatrick put forward the idea of mathematical skills introduced by the Mathematics Learning Study Committee, National Research Council (NRC), USA in Adding It Up: Helping Children Learn

Mathematics. The formulation of NRC's ability and mathematics skills in the book *Adding It Up: Helping Children Learn Mathematics* are: (1) Conceptual understanding, ie understanding of concepts, operations and relations in mathematics owned by students, (2) Procedural fluency, (3) Strategic competence, ie ability or ability to formulate, present, and solve mathematical problems, (4) Adaptive reasoning, ie capacity to estimate, reflect, explain, and assessing mathematics, (5) Productive disposition, ie, the habits of students who tend to see mathematics as plausible, useful, and valuable along with their belief in self-persistence and success in mathematics [3].

Implementation of mathematics learning, especially on students still experience problems, especially the low level of success in learning mathematics students. Yaniawati argues that in general based on the results of the Third International Mathematic and science Study of Repeal (TIMSS-R) study, among 38 countries, Indonesian student achievement is at number 34 for mathematics [4]. While the achievement of mathematical value in state examinations, at all levels and levels of education is always fixated on a low number of ± 5 .

Based on interviews of researchers on January 9, 2017 with a math teacher in grade V SDN 101874 Batang Kuis, it is known that students are less interested in learning mathematics delivered teachers in the classroom. At the time the teacher delivered the lesson material the students pay less attention to the explanations that are delivered and often play around in the classroom. Students consider mathematics lessons to be difficult lessons that make students unable to understand the subject matter of mathematics. Students do not try to study seriously repeat the lesson, do the exercises math problems so as to cause low student learning outcomes.

The problem of low learning outcomes experienced by students can occur due to a strategy or learning model oriented to traditional approaches that less place and pay attention to learners in the learning process. The way the teacher conveys the lesson material is like a flat build that is not appropriate, either because the learning model is mainly the delivery of material that is not related to the life of the students. These factors led to the difficulty of learning mathematics students so low the results of learning mathematics. Another factor that also gives the effect of low learning outcomes of students is that teachers do not maximize the use of concrete learning media that is able to support the process of delivering mathematics materials in the classroom. Teachers more often use textbooks that have been provided at school. Teachers should be more creative in using various existing media such as laptops, projectors, and interactive learning CDs that can support and provide motivation to students in following the learning of mathematics in the classroom.

Teacher's belief in the benefits of learning video media is not applied in the implementation of teaching and learning in the classroom, this is evidenced by the statement of teachers by 50% never use video learning media in classroom teaching. The reason for not using the video media due to lack of ability in the use of technology and has not had the facilities and facilities to use such video media such as laptops. The success of improving the quality of human resources through education can not be separated from the ability of teachers in designing a learning process so that students acquire skills and values that meet national standards. This is certainly supported by the ability of teachers in teaching. Hamalik suggests that teaching is meant to convey knowledge to students, pass on culture to the younger generation, organize the environment so as to create learning conditions for students, provide guidance to students, preparing students to become good citizens, a process of helping students face everyday life [5].

In the implementation of learning teachers are required to choose and use the appropriate learning model centered on the students so that the results achieved more leverage. One of the learning model is the problem-based learning model where there is a change of learning that involves the students with all the nuances, also includes all the ties, interactions and differences that maximize the moment of learning. Arends suggests that problem-based or problem-based learning model is a learning model designed to solve the problems presented [6]. The problem-based learning model is a learning model that presents a variety of authentic and meaningful problem situations to learners, which can serve as a springboard for investigation and investigation. Learning by using problem-based model in execution occurs learning interaction in accordance with the characteristics of students. Learning with problem-based models emphasizes learning that involves students according to the characteristics of students and psychologically gives a positive impact on the age of students, especially students in elementary school who they prefer to move rather than just listen to a lecture delivered by the teacher. This learning model will be better able to improve students' understanding and mastery so as to improve student learning outcomes.

The results of Cazzola study on Problem Based Learning and Mathematics (Possible Synergical Actions) suggest that there is a significant relationship in the application of problem based learning to improve learning outcomes [7]. Increased student learning outcomes by using problem-based learning is due to the ability of understanding and mastery of students to the subject matter that is delivered in the learning process. The results of Senocak's study on The Effects of Problem-Based Learning Instruction on University Students' Performance of Conceptual and Quantitative Problems in Gas Concepts [8]. The results suggest that problem-based learning helps students to think, to solve problems and to improve their thinking skills by building real

situations or resembling those related to concepts to be learned. Based on the results of this study certainly in teacher-based learning should set the class to seek teaching and learning process that shows the process of development and improvement of student self-ability. Matthew's study on Investigative Primary Science: A Problem-based Learning Approach [9]. The results of this study suggest that experience by applying the PBL approach to teaching and learning science for teachers is a learning that links the problem solving by designing and building children's abilities related to real life. Problem-based learning is successful in terms of fulfilling the improvement of studies especially in science learning.

In addition to the learning model, media factors used also have an impact on the success of the learning process undertaken by teachers. Uno suggests that the function of media usage specifically on the learning of mathematics that students will be more to follow the lesson with joy, abstract concept in mathematics can be presented in concrete form, the child will realize the relationship between learning with objects in surrounding, and abstract concepts of mathematics in the form of concrete models can be used as research objects, research tools, and find new relationships [10].

Various types of media can be selected and used by teachers, of course, must be in accordance with the subject matter presented. One of the learning media that can be used is video learning media. Teachers can utilize learning video media to further streamline the learning process especially by using problem-based learning model. Results of research Shilpa about New media technology in education A genre of outreach learning. The results suggest the conclusion that the media allows students to build their own knowledge and improve their skills for professional development [11]. Indeed new media technologies are woven into academia providing a multidimensional approach to the education sector and the knowledge economy. Media technology in education is creating a genre of learning outreach and contributing to a global leader in the future.

The results of McMahon's study on the Effects of Integrated Video Media on Student Achievement and Attitudes in High School Chemistry [12]. The results of the study suggest that the use of video media has an impact on the learning process of students, especially in providing understanding, mastery and improvement of student learning outcomes. Based on the research results presented above, both in the use of learning models and instructional media, especially the use of learning video media, in its use is to facilitate teachers in the implementation of the learning process so as to create a learning process that is student-centered, learning encourages students to be more active, the ability of teachers to use media in accordance with the subject matter.

For that, teachers can use problem-based learning media by utilizing the appropriate video learning media to deliver math lesson materials especially in the discussion of wake up flat, the material presented not only in abstract but more can be realized concretely by using learning media. The use of this video media helps elementary students in real understanding of the material when it is delivered by the teacher in the classroom. Therefore, the need to develop learning video media by applying problem based learning that is able to enable students in learning so as to improve student learning outcomes.

II. METHOD

The type of this research is development research with the development model used is Thiagarajan model with Four-D (Model 4-D). The subjects of this study are the students of grade V SDN 101874 Batang Kuis with a total of 30 students. As the object of research is the development of problem-based learning videos on the mathematics lesson of building a flat matter. The research instrument is a questionnaire of expert assessment, student response questionnaire, teacher response questionnaire, and student learning test instrument.

III. RESULT AND DISCUSSION

Result

To produce problem-based learning video media that meets valid criteria, feasible and effective in its use, in this research study of video-based learning media based on this problem using research model developed by Thiagarajan known as Four-D Models model. The final preliminary analysis activity was specifically carried out on the implementation of the learning in SDN 101874 Batang Kuis Deli Serdang District which aims to determine the main problem needed for the development of problem-based learning video media on the subject of mathematics of flat wake material in class V SDN 101874 Trunk Kuis. Based on the results of the questionnaire given to 8 teachers related to the initial analysis of the needs of the problem-based learning video media can be stated below :

Table 1 Learning Video Needs Analysis

No	Question	Answer	Percentase
1.	Get to know learning videos.	Yes, Very Familiar Yes, Familiar	75,00% 25,00%
2.	Using learning video media.	Often Seldom	12,50% 37,50%

		Never	50,00%
3.	The use of learning videos improves students' motivation and learning outcomes	Very Agree Agree	75,00% 25,00%
4.	Video criteria in learning	In accordance with the curriculum Equipped with usage instructions, language appropriate for age and attract students' attention.	75,00% 25,00%

Based on the facts from the analysis of the needs of teachers above can be seen that during this time teachers have been familiar with learning video media but teachers do not have their own video media used to support learning activities in the classroom. During the course of teaching the teacher more often uses the existing package book and the blackboard media.

Furthermore, the analysis of the students of SDN 101874 Batang Kuis is related to the characteristics of students. At this time students experience a late childhood that lasts from the age of six years to approximately the age of eleven or twelve. The primary characteristic of elementary students is that they display individual differences in many aspects and areas, among them, differences in intelligence, cognitive abilities, language, personality development and physical development. Based on this characteristic, teachers need to pay attention to student development especially on aspects of their cognitive development and thinking style. Teachers must design learning that is able to stimulate the cognitive growth and thinking style of students, especially by using visual learning media that can attract student motivation to be more active during the learning process in the classroom.

Furthermore, from the analysis of academic results to the students of SDN 101874 Batang Kuis is still low. This can be proven from the results of the calculation of the students' math score at the end of the fourth semester of successive repetition that is below the limit of KKM that is in the range of 50.55 score. This analysis is also supported by interviews with mathematics teacher of SDN 101874 Batang Kuis which confirms that students' academic ability especially on math subjects is still low and only few students are able to get good grades at the end of each semester test. Analysis of the formulation of learning objectives is on indicators of achievement of learning outcomes that are translated into more specific indicators in the form of objectives to be achieved on learning. The formulation of learning objectives is as a guide for researchers to develop learning tools in the form of learning video media, especially video-based learning media on the issue of flat building materials.

Furthermore, at the design stage of the selection of appropriate media, selection of formats and initial design on learning media developed in the mathematics lesson material wake flat. Learning media developed and as needed in the implementation of learning is a problem-based video learning media on mathematics lesson material wake flat in class V SDN 101874 Batang Kuis. Development of this type of problem-based learning video has been adapted to the concept map analysis and the formulation of learning objectives so that through this video media students are really able to memamahi and master the lessons given.

In the development stage, the researcher performs the initial designing activity on the problem-based learning video media for the mathematics lesson of flat wake material. Expert validation at this stage of product development of problem-based learning video media consists of 3 (three) experts. Summarize the results of the assessment of problem-based learning media by expert material as follows:

Table 2. Summary of Expert Expert of Material on Problem Based Video Learning Media

No	Aspect of assessment	Score	Percentage	Criteria
1.	Feasibility of Content	28	93,33%	Very good
2.	Presentation	28	93,33%	Very good
3.	Language	14	93,33%	Very good
4.	Abandonment	10	100%	Very good
Percentage			95,00%	Very good

Based on Table 2 on the assessment of problem-based learning video by the material expert, it can be concluded that the results of the expert assessment of the material on the learning video media developed are of very good category and are suitable for use. Subsequent validation of instructional design experts. Summarize the results of the assessment of instructional design experts on the problem-based learning video media as follows :

Table 3. Summary of Instructional Design Expert's Expert on Problem Based Video Learning Media

No	Aspect of assessment	Score	Percentage	Criteria
1.	Feasibility of Content	19	95,00%	Very good
2.	Presentation	50	90,91%	Very good
3.	Language	31	88,57%	Very good
Percentage			91,40%	Very good

Based on Table 3 it can be concluded that the assessment of problem-based learning video media in the mathematics lesson of building materials based on the assessment of instructional design experts is stated with very good criteria with the average score of 91.40 so it is very feasible to use. Next is validation of media experts. Summarize the results of expert media judgment on the problem-based learning video media as follows:

Table 4 Summary of Media Experts on Problem-Based Video Learning Media

No	Aspect of assessment	Score	Percentage	Criteria
1.	Feasibility of Content	34	85,00%	Very good
2.	Abandonment	30	85,71%	Very good

Based on Table 4, it was concluded that the assessment of problem-based learning video media in the mathematics lesson of wake-up material based on media expert's judgment is stated with very good criteria and very feasible to be used. After validation of the learning video by the material experts, instructional design experts, and media experts, then piloted the problem-based rooting video media developed. The following summarizes the results of student responses on individual trials of problem-based learning video media as follows:

Table 5 Summary of Student Feedback on Individual Trial of Problem Based Learning Videos

No	Aspect of assessment	Score	Percentage	Criteria
1.	Content	56	93,33%	Very good
2.	Aim	29	96,67%	Very good
3.	Appropriateness	15	100%	Very good
4.	Quality Engineering	58	96,67%	Very good
5.	Visual Fascination	60	100%	Very good
Percentage			97,33%	Very good

Based on Table 5, it can be concluded that the assessment of problem-based learning video media in the mathematics lesson of wake-up material based on students' responses on individual trials is stated with very good criteria with an average score of 97.33% so it is very good to use. After conducted individual test to 3 students with criteria have high learning ability, moderate and low, then small group test to class V student of SDN 101874 Batang Kuis of 6 students. The following summarizes the results of student responses on small group trials of problem-based learning video media as follows:

Table 6. Summary of Student Responses to Small Group Trial on Problem Based Learning Videos

No	Aspect of assessment	Score	Percentage	Criteria
1.	Content	116	96,67%	Very good
2.	Aim	57	95,00%	Very good
3.	Appropriateness	30	100%	Very good
4.	Quality Engineering	115	95,83%	Very good
5.	Visual Fascination	120	100%	Very good
Percentage			97,50%	Very good

Based on Table 6, it can be concluded that the assessment of problem-based learning video media in the subject of flat matter mathematics based on student responses on small group trials is stated with very good criteria with an average score of 97.50% so it is very good to use. Further field trials were conducted. Summarize the results of student responses on field tests of problem-based learning video media as follows:

Table 7. Summary of Student Feedback On Field Trial To Problem Based Learning Video

No	Aspect of assessment	Score	Percentage	Criteria
1.	Content	578	96,33%	Very good
2.	Aim	284	94,67%	Very good
3.	Appropriateness	150	100%	Very good
4.	Quality Engineering	588	98,00%	Very good

5.	Visual Fascination	599	99,78%	Very good
Percentage			97,76%	Very good

Based on Table 7, it can be concluded that the assessment of problem-based learning video media in the mathematics lesson of the wake-up material based on the students' responses on field trials is stated with very good criteria with the average score of 97.76% so it is very good to use. Furthermore, the teacher's response to the problem-based learning video media. Summarize the results of teacher responses to the problem-based learning video media as follows.

Table 8 Summary of Master's Response to Problem-Based Video Learning Media

No	Aspect of assessment	Score	Percentage	Criteria
1.	Content	18	90,00%	Very good
2.	Aim	10	100%	Very good
3.	Appropriateness	13	86,67%	Very good
4.	Quality Engineering	18	90,00%	Very good
5.	Visual Fascination	17	85,00%	Good
Percentage			90,33%	Very good

Based on Table 8, it can be concluded that the assessment of problem-based learning video media in the mathematics lesson of building materials based on teacher responses is stated with very good criteria with an average score of 97.76% so it is very good to use. Based on the revised and virgin notes put forward by the experts, then the step of implementing the revision of course after the completion of product validation by experts. The average percentage of the results of the expert's assessment after the implementation of the revision can be put forward as follows:

Table 9 Percentage of Expert Assessment Results on Media Video Feasibility Feasibility

No	Aspect of assessment	Percentage	Criteria
1.	Learning materials	95,00%	Very good
2.	Instructional Design	91,49%	Very good
3.	Instructional Media	85,36%	Very good
Average		90,62%	Very good

Thus, it can be concluded that the problem-based learning video-learning media product is categorized as excellent with an average score of 90.62% with the conversion of achievement level is considered to be a very viable category to use. The average diagram of the percentage of expert judgments can be seen in the following figure:

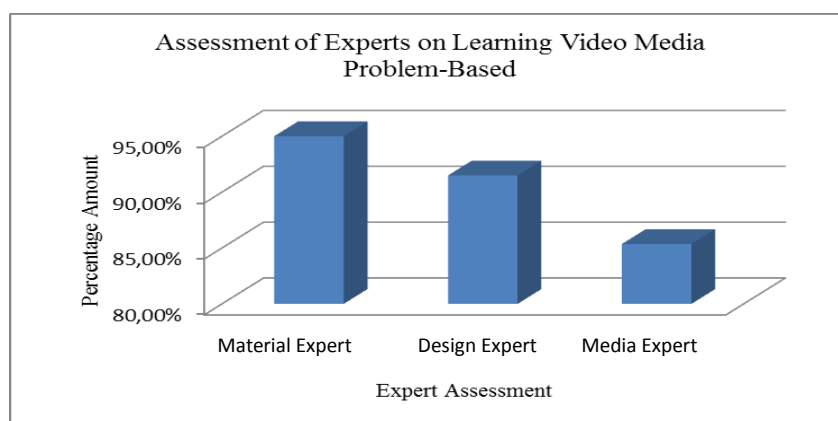


Figure 1 Diagram of Expert Rating Bar on Problem Based Video Learning

Further analysis of the test results. Analyzes of trial results were conducted on each of the test groups in relation to each aspect of a pre-determined assessment and based on the average score of each category. Analysis of individual, small group trial and field trials of problem-based learning videos can be put forward as follows:

Table 10. Percentage of Student Response Results on Problem Based Media Learning In Individual Trials

No	Aspect of assessment	Percentage	Criteria
1.	Content	93,33%	Very good
2.	Aim	96,67%	Very good

3.	Appropriateness	100%	Very good
4.	Quality Engineering	96,67%	Very good
5.	Visual Fascination	Very good	Very good
Average		97,33%	Very good

Based on Table 10, it can be argued that the average percentage of students' responses on individual trials is 97.33% and is categorized as excellent. Furthermore, the average percentage of student responses to the instructional videos in the individual trials can be presented below:

Table 11. Percentage of Average Results of Student Responses to Problem-Based Media Learning On Small Group Trials

No	Aspect of assessment	Percentage	Criteria
1.	Content	96,67%	Very good
2.	Aim	95,00%	Very good
3.	Appropriateness	100%	Very good
4.	Quality Engineering	95,83%	Very good
5.	Visual Fascination	100%	Very good
Average		97,50	Very good

Based on Table 11 above can be presented the average diagram of the percentage of student responses in small group testing of 97.50% and including the category of very good.

Table 12. Average Percentage of Students' Responses to Problem-Based Media Learning On Field Trial

No	Aspect of assessment	Percentage	Criteria
1.	Content	96,33%	Very good
2.	Aim	94,67%	Very good
3.	Appropriateness	100%	Very good
4.	Quality Engineering	98,00%	Very good
5.	Visual Fascination	99,78%	Very good
Average		97,76%	Very good

Based on Table 12, it can be argued that the average of the percentage of students' responses in the field trial is 97.76% and is categorized as excellent. The development of problem-based learning video media according to the model used is the deployment stage, where after the expert validation stage, eligibility, student responses and subsequent teacher response deployment stages as evidence to test the effectiveness of the use of the developed video by viewing the pretest and postes learning results.

Before the deployment stage is conducted using problem-based learning videos, students are given a pretest to determine students' early skills. Pretest in the form of answers to the description or explanation given to the students. The frequency distribution of the students' pretest results in the mathematics lesson of the wake-up material before using the learning video can be put forward as follows :

Table 13 Predatory Frequency Distributions of Student Mathematics Learning Results Before Using Problem Based Learning Videos

No	Interval	Frequency	Percentage	Cumulative Percent
1.	35-40	2	6,67	6,67
2.	41-46	5	16,67	23,33
3.	47-52	8	26,67	50,00
4.	53-58	8	26,67	76,67
5.	59-64	5	16,67	93,33
6.	65-70	2	6,67	100,00
Total		30	100,00	
Average		52,33		

Based on Table 13 on the frequency distribution of pretest mathematical results before using the problem-based learning video media obtained the maximum score is 70, minimum score 35, the mean value is 52.33 mode is 50, the median is 52.50, the variance is 59.89 and standard deviation is 7.74. Based on the average score known that 8 people or 26.67% are on the average score of learning outcomes, as many as 7 people or 23.40% are below the average score of learning outcomes, and as many as 15 people or 50.00% is above the average score of learning outcomes.

Based on Table 13 on the distribution of pretest frequency of mathematics learning results before using problem-based learning videos can be put forward as follows:

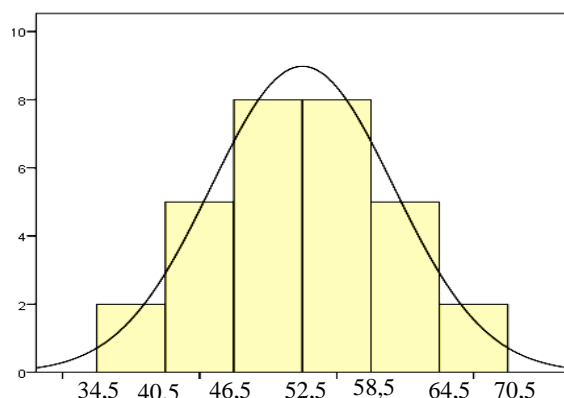


Figure 2 Histogram Pretes Student Math Learning Results Before Using Video Learning

Based on the picture 1 about the pristine histogram of the students' mathematics learning before using the learning video, it can be concluded that the data of the pretest learning scores of the students' mathematics learning have a normal distribution of data and in accordance with the criteria of the students' learning outcomes that have been determined. The frequency distribution of postes of students' mathematics learning after using problem-based learning videos can be stated:

Table 14 Frequency Distribution of Postes Learning Outcomes of Student Mathematics After Using Video Learning

No	Interval	Frequency	Percentage	Cumulative Percent
1.	50-58	2	6,70	6,70
2.	59-67	3	10,00	16,70
3.	68-76	8	26,70	43,40
4.	77-85	8	26,70	70,10
5.	86-94	7	23,30	93,40
6.	95-103	2	6,70	100,00
Total		30	100,00	
Average		80,57		

Based on Table 14 concerning the distribution of pretest frequency of the expository students' learning outcomes before using interactive media obtained the maximum score is 100, minimum score 50, the average value is 80.57 mode is 75, the median is 83, the variance is 136.59 and the standard deviation is 11.69. Based on the average score known that 8 people or 26.70% are on the average score of learning outcomes, as many as 13 people or 43.40% are below the average score of learning outcomes, and as many as 9 people or 30.00% is above the average score of learning outcomes.

Based on Table 14 on postes frequency distribution data of learning result of mathematics of flat wake material after using problem-based learning video media can be expressed on the bar chart picture as follows:

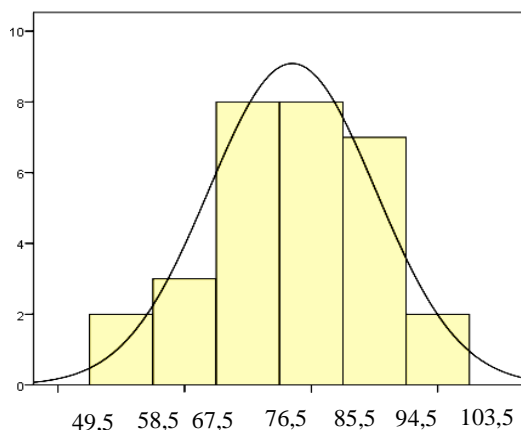


Figure 3 Postes Histogram Student Learning Results After Student Using Problem-Based Learning Videos

Based on the picture 2 on the histogram postes the result of learning mathematics of students after using video-based learning media can be raised the conclusion that the data distribution of postes result of learning mathematics of wake up matter with having the distribution of normal data and in accordance with the criteria of assessment of student learning outcomes that have been determined.

Based on the pretest and postes of student learning outcomes in the table above it can be put forward the conclusion:

1. The increase of students' learning outcomes in the mathematics lesson of the wake-up material before the use of learning video acquisition score of an average of 52.33 after the use of learning video has an average increase of 80,57.
2. The achievement of student learning achievement is by obtaining the average score of learning outcomes of 80.57 and classical completeness reached 93.33%.
3. An average of 97.76% of students responded positively to the use of problem-based learning videos developed at the time of use in the mathematical learning of flat wake material.

Furthermore, it can be seen the effectiveness of problem-based video learning media developed with the proving of the value of N Gain :

Table 15. Improved Student Mathematics Learning Outcomes Material Waking Flat On Field Test

(1)	(2)	(3)
Average	Pretes	Postes
	52,33	80,57
Gain	0,62	
Percentage Gain	62%	
Category Gain	Medium	

Based on the calculation of N-Gain of pretest and postes result of learning mathematics of waking matter on Grade V student of SDN 101874 Batang Kuis Subdistrict of Deli Serdang Regency can be concluded that the criteria of improvement of mathematics learning outcomes in flat wake material is included in medium category ($0.3 \leq g < 0.7$). This also proves that the use of problem-based learning video is effectively used so as to improve the learning outcomes of mathematics of flat waking materials in grade V students at SDN 101874 Batang Kuis District Deli Serdang District.

Furthermore, for the phase of dissemination is also done trial at other schools that is in grade V SDN 060856 Medan City. Based on the dissemination test results on the students of grade V of SDN 060856 Medan City can be presented prestes and postes results as follows :

Table 16 Distribution of Pretest and Postes Frequency Results of Student Mathematics Learning Stage of Spreading

Pretes			Postes		
No	Interval	Frequency	No	Interval	Frequency
1.	35-40	2	1.	50-58	2
2.	41-46	3	2.	59-67	3
3.	47-52	10	3.	68-76	10
4.	53-58	10	4.	77-85	10
5.	59-64	3	5.	86-94	3
6.	65-70	2	6.	95-103	2
Total		30	Total		30
Average		52,50	Average		78,73

Furthermore, it can be seen the effectiveness of problem-based learning video media developed with the proving of N Gain value that is:

Table 17. Increased Student Mathematics Learning Outcomes Material Waking Flat In Spreading Test

(1)	(2)	(3)
Average	Pretes	Postes
	52,50	78,73
Gain	0,57	
Percentage Gain	57%	
Category Gain	Medium	

Based on the above calculation it can be concluded that at the stage of spread of N-Gain pretest and postes learning outcomes including medium category ($0.3 \leq g < 0.7$). This proves that the use of problem-based

learning video is effectively used so that it can improve the learning outcomes mathematics of the building materials flat class V students Elementary School 060856 Medan City.

IV. Discussion

Based on the result of expert validation test by giving assessment and suggestion on the problem-based learning video, it is known that the average percentage of material expert review is 95,00% with very good category, the average of instructional design expert is 91,49% with very good category, the average assessment of learning media experts amounted to 85.36 with a very good category. The overall average expert judgment of 90.62% with very good category and conversion rate of achievement is very good and very feasible to use. Based on the results of responses or responses of students to video-based learning problems through individual testing, small groups and field tests can be obtained the average score that is for individual tests average score of 95.33% with very good category, small group test with score an average of 95.50% with very good category, field test average score of 97.76% with very good category. The overall average score on the responses or student respondents to the learning video developed is 96.20% with very good category and the conversion rate of achievement is excellent which means it is very worthy to use.

Based on the results of teacher responses to problem-based learning videos developed it can be seen that the average score on content aspect of 90.00%, goal aspect of 100%, feasibility aspect of 86.67%, technical quality aspects of 90.00% , and visual attractiveness aspect of 85.00%. The overall average score on teacher responses to learning videos developed is 90.33% with very good category and the conversion rate of achievement is excellent which means it is worthy of use.

In the implementation of learning activities, then every teacher must have a medium of learning. Learning media is a learning component that includes materials and equipment. With the inclusion of various theories and technologies, the learning media continues to experience and perform in various types. Some practical uses of the use of learning media is the learning media can clarify the presentation of messages and information so as to facilitate and improve the process and learning outcomes. In addition, learning media can improve and direct the attention of learners so that it can lead to learning motivation, more direct interaction between learners and their environment, and the possibility of learners independently in accordance with their abilities and interests. Learning media can also overcome the limitations of the senses, space and time.

Lots of roles from the media in learning, including learning will attract more learners so that it can lead to learning motivation and allows learners to master the goals of better learning. In addition teaching methods will be more varied, not merely verbal communication through the words by the teacher, so that learners do not get bored and the teacher is also not exhausted especially when the teacher teaches every hour of the lesson. The role of the media in subsequent learning is to make learners more learning activities, and other activities such as observing, performing, demonstrating, etc..

Rusman suggests about the classification of learning media, namely: 1) visual media is a medium that can only be seen by using the sense of sight, 2) audio media is a medium that can only be heard by using the sense of hearing only [13]. This media contains an auditive message that can stimulate the mind, feelings, attention, creativity and innovative learners but requires hearing ability and listening to learners and 3) audio visual media is a tool that can be used through hearing and sight. Teachers need to pay attention to the characteristics and capabilities of each media according to the learning needs.

Munadi suggests that the learning media is actually more focused then in two functions namely 1) the function based on the medium of learning media as a source of learning, semantic function, maipulatif function, 2) a function based on its use (students) there are two functions, namely psychological functions and socio-cultural functions [14].

A teacher can motivate his students in order to generate interest in learning by giving and raising expectations. The expectation of achieving a passion or purpose can be the motivation that teachers generate into students. One of the provision of hope that is by facilitating the students in receiving and understanding the content of the lesson that is through the utilization of appropriate instructional media. Furthermore Arsyad asserted that the use of teaching media in the process of teaching and learning can generate new desires and interests, generate motivation and stimulation of learning activities, can even bring psychological influences on students [15]. The use of instructional media at the teaching orientation stage will greatly help the effectiveness of the learning process and deliver the message and the content of the lesson at that time.

Learning activities are intrinsically linked to the interaction between learners who are learning with the learning resources around them that allow for changes in learning behaviors. Interaction activities in the realm of teaching and learning process, then the learning media have the capabilities that play a role so as to improve motivation, understanding and achievement.

Learning media as an external factor, can be utilized to improve the efficiency of learning because it has the potential or ability to stimulate the increase of motivation in learning. For example: presenting rare objects, collections of ancient currencies, textures and ancient buildings. The abstract concept becomes

concrete: the market, the exchange. Overcoming barriers of time, place, number and distance, helps to explain prehistory. Reproduce the information correctly without feeling tired: textbooks, modules, video programs or educational films. provides a relaxed and interesting learning environment.

Thus it can be emphasized that the learning media will support the effectiveness of learning, unfortunately not many teachers who use instructional media as one element of the learning process in the classroom. Many things are the reasons for not using the media in the learning process, one of them is because according to the teacher providing learning media requires a lot of cost and a long enough time. In other words the teacher does not want to take a lot of risk, so learning, especially learning to make students quickly experience boredom.

The results of Taiwo's research on Teachers' Perception Of The Role Of Media In Classroom Teaching In Secondary Schools. The International Educational Technology Journal expressed the conclusion that teachers should have a good perception of the role of the media, teachers can use their perceptions as a guide in the use of media as a learning system that emphasizes innovation and change [16]. The use of media as a learning tool is to assist the implementation of learning conducted by teachers. Surya Research Results on Development of Learning Media in Mathematics for Students with Special Needs. The International Journal of Sciences: Basic and Applied Research suggests the conclusion that learning activities created by teachers in accordance with the demands of "developmental worthiness" should be based on an understanding of how children with needs engage in learning as well as how they learn can be reviewed based on constructivist learning theory [17]. The process of course by using the right media.

The results of Agarwal's study on the Use of Multimedia as a New Educational Technology Tool-A Study, International Journal of Information and Education Technology, conclude that the media has great potential to instill flexibility, multi-modal, lifelong education to the heterogeneous masses of learners [18]. The multidisciplinary nature of multimedia makes it increasingly popular among people from different domains. Based on some research results above it can be concluded that the implementation of learning requires appropriate media so that it can streamline the implementation of learning. The role of teachers in choosing and developing appropriate learning media will be a supporting factor for successful implementation of learning in the classroom. Conversely, if teachers do not choose and use the right media will be a factor inhibiting the achievement of learning in the classroom, especially in the effectiveness of the implementation of learning.

Based on the acquisition of pretest and postes of mathematics learning result of flat wake material before and after using problem based learning video can be stated that the average pretest score equal to 52,33 and after using video of learning postes equal to 80,57 with classical completeness equal to 93,33%. Furthermore, the effectiveness of the use of problem-based learning video developed can be proved from the acquisition of N Gain of 0,5924 with the increase including the medium category. This proves that the use of problem-based learning video is effectively used so as to improve the learning outcomes of mathematics of flat wake material in grade V students of SDN 101874 Batang Kuis.

Furthermore, in the dissemination test of problem-based learning videos conducted to grade V students Elementary School 060856 Medan obtained results of learning before using video-based learning problems preview average score of 52.50 and after using video learning postes of 78.73 with classical completeness of 93.00%. Furthermore, the effectiveness of the use of problem-based learning video developed can be proved from the acquisition of N Gain of 0,5522 with the increase including the medium category. This proves that the use of problem-based learning video is effectively used so as to improve the results of learning mathematics of building materials flat on the students of grade V SDN 060856 Medan City.

Teaching is a process that contains a series of actions of teachers and students on the basis of reciprocal relationships that take place in an educational situation to achieve a particular goal, the learning process is at the core of the educational process as a whole with the teacher as the main role holder. On the other hand, teachers in performing their duties are not enough to be self-administered only in order to overcome the difficulties of learning of children, here also need the media, in the sense that the media is a tool that helps teachers in presenting the material taught to students in the learning process.

To improve the students' motivation and learning achievement, it is necessary to hold various innovations or renewal of education. One of the important things that need to be done in improving the quality of education is in the field of education technology using the media. Media in the education is a complex and integrated process that involves many people to support the learning process. Degeng asserted that the media allows students to learn according to the ability, interest, in accordance with the module or programmed learning that can accelerate the ability of each student [19].

Learning media is one means of infrastructure that support the learning process. Anitah states media education serves as a learning resource that helps teachers to channel messages or material information to students in the learning process [20]. The use of learning media does not have to be technology-based, but can be a simple media that is easy to get and easy in the process of making it.

So that learning can be meaningful, not only media that become the supporting factor, but the role of teacher or educator as a motivator or facilitator is a very important factor, because educators should be able to stimulate and encourage to be able to grow student creativity so that it will feel the meaning of a learning. And the teacher must master how to apply the appropriate media. As we know, media is a tool that connects us to the outside world. Without media, we will have difficulty knowing what is going on around us. Therefore it can be said that the media is the main source of information for all people in the world. But every media certainly has advantages and disadvantages.

Media is a tool to provide stimulation to students in order to occur the learning process. Media should have benefits for the success of students in learning Trianto suggests that the media should provide positive benefits for students, namely: 1) increased learning passion, 2) students develop according to interest and speed, 3) provide stimulation and experience equations, 4) gives the perception of a similar conception [21]. Therefore a teacher is required to take advantage of.

Therefore, Arsyad affirms the function of instructional media, as follows: 1) attention, attract and direct students to concentrate on the content of the lesson, 2) affective function, student happiness level when learning through picture, 3) cognitive function, facilitate the attainment of the objectives for understanding and remembering the information and messages contained in the picture, 4) the compensatory function, providing the context for understanding the text.

David's Research on Effectiveness of Video Presentation to Students' Learning International Journal of Nursing Science puts the conclusion that the use of video is to meet the needs of today's learners and tomorrow [22]. Using videos in teaching is not new. It is proposed that videos be effective when used to develop information literacy, using student surveys to measure the effectiveness of video lectures. Video-based materials enhance students' creativity and cooperation. Access to videos can help motivate students and create different contexts for their learning experiences.

The results of Arkorful's study on The role of e-learning, the advantages and disadvantages of its adoption in Higher Education. The International Journal of Education and Research puts the conclusion that Elearning involves the use of digital tools for teaching and learning [23]. Utilization of technology tools to enable learners to learn when and where. It involves training, delivery of knowledge and motivating students to interact with each other, and exchange and appreciate different perspectives. This facilitates communication and improves the relationships that sustain learning. Although there are several challenges to be discussed, the literature has sought to explain its role in the media particularly strongly impacted on teaching and learning.

Charles Research on Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. International Journal of Education and Development using Information and Communication Technology suggests the conclusion that effective technology integration into classroom practice poses challenges for teachers to develop the learning process. The use of media in teaching becomes the factors that positively affect the achievement of learning outcomes.

Based on the results of the research presented above it can be stated the conclusion that the media has an important role for the successful implementation of learning. By using the media allows learners to learn when and where. Certainly will facilitate communication and improve relationships that sustain in learning and improve student learning outcomes.

V. CONCLUSION

After conducting the process or development stage of the problem-based learning video, the following conclusions are put forward:

1. Problem-based learning video valid used in learning mathematics at SDN 101874 Kuis Deli Deli Serdang District.
2. Problem-based learning video suitable for use in learning mathematics in SDN 101874 Batang Kuis Deli Serdang District.
3. Effective problem-based learning videos used in mathematics learning at SDN 101874 Batang Kuis Deli Serdang District.

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