
"Improving of Motivation and Learning Achievement of Mathematics by Using Computer-Based Learning Media on Quadratic Function Topic in Grade X SMAN 1 Minas"

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ABSTRACT

Motivation and learning achievement of students are a problem that is closely related to the success of students. Motivation and student learning achievement are still low, these could be seen from the end of semester test. One of the efforts taken by teacher in learning process is to use *Macromedia flash* programming as computer-based learning media on the topic of quadratic function in class X to improve motivation and learning achievement of students. The goal is to guide students to get the concept of understanding quadratic function topic. This is a class action research on learning mathematics. The subject of this research is students of grade X of SMAN 1 Minas. The research consists of two cycles. Each cycle consists of four stages: planning, implementation, observation, and reflection. The instruments used to observe the treatment and results of the action are the students' motivation observation sheets and student's test results sheet. Based on the results of the study, motivation and learning achievement can be improved by using computer-based learning media quadratic function in learning mathematics in class X SMAN 1 Minas. This can be seen from the increase of learning motivation which increase from cycle 1 to cycle II by 22,78% and result of learning increase from cycle I to cycle II equal to 39%. Improve learning achievement is easy to achieve because in the use of this media students closer to the application. The use of quadratic programming media programs is designed to convey the concept of learning topics with students directly using this program to learn. The program which is made by using *Macromedia Flash* is more interactive with the form of animation motion and sound more complex and can be included simple programs that can not be done by using *Microsoft Powerpoint*. After that the students are expected to find their own concepts that must be understood in the matter of quadratic functions and solve all problems related to quadratic functions more easily. Finally, it can be concluded that using computer-based learning media can help students to build the concept of understanding quadratic function topic

Introduction

Mathematics as a basic science that plays an important role, both in everyday life and in the development of science and technology. Recognizing the importance of the role of mathematics, it requires a high enough understanding to master the concepts and theories contained therein. Mathematics learning is a vehicle for students to think logically, systematically, and critical thinking and the prospect of further development of

science and technology in applying it in everyday life so as to improve self-competence.

The ability in communication of mathematical language determines the success of daily communication. Delivering mathematic idea in communication by using diagrams, mathematical equations, graphs, or tables is more practical, systematic, and efficient. In new globalization era, those who use and understand mathematics will get better

opportunities and choices in determining their future. Ability in mathematics will open the door to a productive future. Weak in math will close the door. All students must have the opportunity and support needed to study and understand math. There is no contradiction between equality and excellence (NCTM, 2000). Given many expectations for mathematics subjects, teachers must have skill in delivering information, develop problem-solving skills, and communicate the ideas. But the most important things, teacher must be able in increasing the motivation in studying mathematic. If the motivation is already increased it that should be simultaneously in the improvement in student achievement. Because motivation is the one important factor in the increasing student achievement in mathematics.

Researchers believe all teachers want to provide the best for their students, but sometimes they are faced with changing environmental conditions, and the changes have an affect on the learning process. Small example, with a variety of computer applications, mobile phones or other electronic devices as if to make student feel that the electronic device is more interesting than a textbook. This phenomenon will continue as the world changes. As a teacher we have the choice of whether to go against the flow or begin to follow the flow of development without running away from our primary goal as a teacher, one of which is to educate our student to become independent student, to have a high intellect and to form a good personality.

Quadratic function material is one of the materials that requires analysis in understanding the shape of the graph. During this time the average student has difficulty in making the graph of quadratic functions due to lack of media that can help students in understanding the material concretely so that

students are required to be able to imagine the form of graphs that formed. This will only make little progress towards the motivation and success of students to understand the matter of quadratic functions.

	EXAM		KKM
	UTS	UAS	
Tuntas	25	18	70
Tidak Tuntas	15	22	
Sum	40	40	

Seeing the conditions that have been described, the authors want to re-improve and continue the efforts that have been done by previous teachers. Therefore, the use of media in learning to generate student learning motivation is needed. On this occasion the author tries to use programs created through *Macromedia Flash*. This program has been created before but has not been used to see the influence of the media on student's motivation and learning achievement.

Based on the above problem identification, can the authors identify the problems that arise are:

1. Motivation learn math students not optimal
2. Student learning achievement have not been optimal
3. The use of instructional media in the classroom is still minimal
4. Active students are few
5. Learning model that has been applied has not been able to achieve the expected goals.

The purpose of this research are:

1. Find out the improvement of motivation to learn mathematics of students of class X

SMAN 1 Minas by using media program of quadratic function.

2. Find out the increase of learning result of mathematics of student of class X SMAN 1 Minas by using program of quadratic function.

According to Sadiman (2011: 6), instructional media is anything that can be used to channel the message, stimulate the mind, the feeling, the attention and the willingness of the students so that they can be encouraged to be involved in the learning process. Media usage is implemented with the aim to students gain experience directly. By using such media in learning, students are expected to be more understanding and applicative to the learning materials. The use of learning media quadratic function will make the students' learning atmosphere varies slightly, so that each students are motivated with a more fun and challenging learning atmosphere. This is able to increase the motivation of students in learning mathematics.

The emergence of high motivation and emphasis in the learning stages will have a great effect on the learning achievement of students. Increased learning achievement will be easy to achieve because in the use of this media students closer to the application. The use of quadratic programming media programs is designed to convey the concept of learning materials with students using the program directly to learn. After that the students are expected to find their own concepts that must be understood in the matter of quadratic functions and solve all problems related to quadratic functions more easily.

Learning media technology using *Macromedia Flash* program is generally better to use than other computer media because the program making *Macromedia Flash* is more interactive with the form of animation motion and sound more complex and can be included simple programs that can

not be done by using *Microsoft Powerpoint.Macromedia Flash* learning program is very easy to use and can be used anywhere and anytime using electronic devices such as computers, laptops or ipad.

The use of *Macromedia Flash* learning media for the material of quadratic function is expected to succeed in improving the learning achievement of students because the learning process is more interesting and interactive and students experience themselves the process of finding (inquiry) concept in the matter of quadratic function in the learning process so as to produce changes in the students themselves.

Methodology

This study is a class action wherein this classroom action research is a practical research that aims to improve and to overcome the weaknesses in learning in the classroom. By implementing this activity is expected to find a solution that can solve the problems that exist in learning in the classroom.

This research was carried out in class X SMAN 1 Minas Siak District. This research was conducted in the odd semester of 2016/2017 on the subjects of mathematics, which was implemented in line with the implementation of learning in the classroom. The subjects of this study were the students of class X SMAN 1 Minas Siak district, amounting to 30 students.

1. Planning Stage:
 - a. Creating a Learning Implementation Plan (RPP)
 - b. Establish learning motivation indicators
 - c. Create an observation sheet of learning activities

- d. Creating an observation sheet on the ability of students in solving the given problem.
- 2. Stage of Action
The action stage consists of Introduction, Core Activities, Closing.
- 3. Observation
Observations made is the process of observation of the implementation of mathematics learning using Macromedia Flash learning media using observation sheet, activity sheet of students and motivation students students.
- 4. Reflection
After the data is collected in cycle I, the data is analyzed by the researcher along with the observer, the weaknesses that occur in the first cycle set the actions to overcome these deficiencies for the next cycle.

Instruments in this class action research are as follows:

- 1. Learning Implementation Plan (RPP)
- 2. Evaluation sheet of the learning result
- 3. Observation sheet
- 4. Sheets of teacher activity
- 5. Field note sheets

Data collection technique

The test of learning achievement is used to see the level of learning achievement of students given after completion of the subject and at the end of the cycle. Observation Sheets Teacher Activity and Students are used as validation of the observer's observation to the students and the actions of the teacher. Student Observation Sheet is based on learning motivation indicators.

Data analysis technique

Data Analysis Techniques Motivation and

Student Learning achievement:
 $Average\ value = \frac{\text{number of observed values}}{\text{ideal number of values}} \times 100\%$
 Information :
 76% - 100% = High Once
 56% - 75% = Height
 26% - 55% = Low
 0% - 25% = Low Once

Research and Development Results

Based on the problems in learning, then planned an action consisting of planning, implementation, observation, and reflection so that students can improve motivation and learning achievement.

Cycle 1:

Planning Implementation of Action

Students are divided into 10 groups and explain the objectives to be achieved in the group discussion. The teacher associates the matter of quadratic functions with daily life and conveys the learning objectives. The teacher sets up the quadratic function application program and explains how the program works. Students sit in groups and discuss materials using the quadratic function application program. Teachers always direct students to participate actively in group discussions. The teacher invites students to dialogue about the matter of quadratic functions. Teachers measure the ability of students through homework and the problems contained in the who want to be a millionaire version of the quadratic function. As a final activity, the teacher concludes the lesson, and closes the lesson with prayer and greetings.

Cycle 2:

Planning for improvement of deficiencies made in cycle 1

Implementation of Action

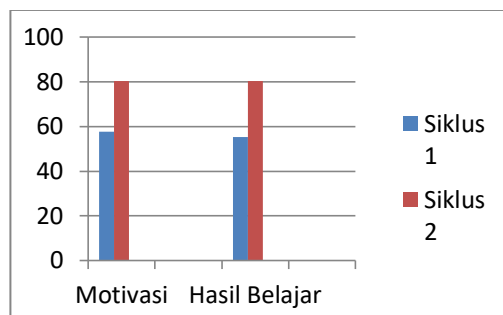
Students are divided into 10 groups and explain the objectives to be achieved in the group discussion. The teacher associates the matter of quadratic functions with daily life and conveys the learning objectives. The teacher sets up the quadratic function application program and explains how the program works. Students sit in groups and discuss materials using the quadratic function application program. Teachers always direct students to participate actively in group discussions. The teacher invites students to dialogue about the matter of quadratic functions. The teacher guides the learner through the inquiry process while studying the graph of quadratic function with the help of quadratic function application program. Teachers remind students to better work with group members so that knowledge sharing among high-performing students with low-ability students is possible. Teachers continue to guide students who do not understand the subject matter. Teachers measure the ability of students through PR and the problems contained in the who want to be a millionaire version of the quadratic function. As a final activity, the teacher concludes the lesson, and closes the lesson with prayer and greetings.

The data collected through observation and observation and learning achievement were analyzed as follows:

No	Motivation Indicators	%	%
		Cycle 1	Cycle 2
	Sum	518	722
	Average	57,56	80,22

Learning achievement	Cycle 1	Cycle 2
Sum	1660	2410
Average	55,33	80,33

From the above table then the motivation and student learning achievement can be presented in the form of diagrams as follows:



From the diagram can be seen an increase in motivation students from cycle 1 to cycle 2 by 24.89% and increase student learning achievement from cycle 1 to cycle 2 by 25%.

Reflection

Based on the actions that have been done in cycle I and cycle II can be stated as follows:

- a. There is an increase in learning motivation of students in following the process of learning math significantly in every cycle
- b. Students have been able to work together well
- c. Need practice in cooperative learning using computer-based learning media, to emphasize that learning not only individually but also can be done together.
- d. From each motivation and the results obtained students should be able to improve and be applied in the learning that will be implemented next.

The learning achievement of students showed a good improvement seen in the value of the material test in which each cycle experienced an increase in the average learning achievement.

Conclusions and Recommendations

- 1. Using the aid of computer-based learning media for the material of quadratic

function can increase the motivation of learning mathematics in students of class X SMAN 1 Minas. This can be seen from the increase in learning motivation from cycle 1 to cycle 2 of 24.89% and student learning achievement increased from cycle 1 to cycle 2 by 25%.

2. The use of Macromedia Flash learning media for the matter of quadratic function is very influential in improving motivation and learning achievement of students because the learning process is more interesting and interactive and students experience themselves the process of finding (inquiry) concept in the matter of quadratic function in the learning process so as to produce changes in self the learner.

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