Learning motivation and utilization of virtual media in learning mathematics

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Abstract

This study aims to describe the learning motivation of students using virtual media when they are learning mathematics in grade 5. The research design applied in this research is classroom action research. The research is conducted in two phases which involve planning, action and observation and reflection. The results of the study revealed that intrinsic motivation to learn is most prevalent in the form of fun to learn mathematics with virtual media. Other forms of intrinsic motivation include curiosity, need and interests, and satisfaction. Extrinsic motivation in the form of awarded and clarity of learning objectives. The most enjoyable learning experience for students was when they feel like they're learning more than they actually are. This level of enthusiasm increases with the level of learning complexity. The students are more active and motivated to learn. This can be evidenced by the increase in motivation to learn after the first phase. Unfortunately, the lack of bandwidth and time allocated for conducting experiments are some of the obstacles in the way of learning through virtual media. This study revealed that the use of virtual media could improve student's motivation for learning.

Keywords: Virtual media, learning, motivation

Introduction

In mathematics, ideas or structures are arranged in a logical manner, and are considered abstract. This branch of science can be used to explain different concepts. Mathematical education has been widely adapted to the needs of the technological progress in various countries. As the learning of mathematics develops, many new tendencies are born. These changes are associated with the challenge of globalization. Learning mathematics is very important in life. In most cases, it is included in the school curriculum. Learning mathematics is a process that involves providing various learning experiences to enable students to acquire the necessary skills and knowledge (Muhsetyo, 2014). The skills that students learn in mathematics are necessary in everyday life. This includes the ability to mentally calculate, divide, and apply formulas (Syahrir, 2010).

The skills that students learn in mathematics are necessary in everyday life. This includes the ability to mentally calculate, divide, and apply formulas. In elementary school, mathematics is a subject that has always fascinated students. There are various characteristics that make it different from the other subjects. In primary school, children are developing their knowledge and skills in mathematics. This subject is required for all students.

Core competencies of math that students must master in grade 5 include addition, subtraction, division, multiplication, and negative integers. These operations are also used in various forms of calculation such as fractions and/or decimals in various forms in the order Operation, explaining the center point, the radius, the diameter, the arc, the bowstring, the tarpaulin and the circle of the juring, explaining the approximate circumference and area of the circle, comparing the prisms, tubes, pyramids, cones and balls, explaining the wake of space which is a composite of several Wake up space and its surface area and volume, explain and compare the mode, median and mean of a single data to determine which value best represents the data.

The relationship between the learning materials and one another is very important for the success of a class. This means that the material that the students are going to learn is very important to them from the beginning. Many of the students who are not able to understand basic concepts of mathematics are from rural areas. This is because, according to their professors, they tend to believe that mathematics is only for the rich. This is especially challenging when students are not able to memorize and understand basic counting operations.

Learning media helps students develop their knowledge and skills. It is a learning medium that helps them achieve their goals and attitudes. Various types of learning

media are available to teachers to use in the classrooms. Some of these include animations, modules, and concept maps.

As a facilitator, the teacher should be able to determine what type of learning media is appropriate for the particular topic. This should include audio and video tutorials, group discussions, and online learning games. Teachers are captivated by the creativity of computers as one of the world's most innovative tools. They commonly use them in learning math by transforming digital objects into real props in the form of computer programs that can be used as real props by Students using the maximum visual representation. Virtual manipulatives (visual manipulatives) is a visual representation of web-based dynamic objects.

Due to the development of technology, virtual props have a huge impact on the education system. This study shows how the use of technology in classrooms has changed the way mathematics is taught. Through the use of new technologies, learning can be made more attractive, effective, and efficient. Learning through virtual technology helps students bridge the gap between the real world and math abstraction.

The difficulties that students face during their learning process make them less motivated to continue with mathematics. This is an external factor that influences their behavior and learning goals. Learning motivation refers to the internal and external factors that motivate students to improve their behavior in general. It can be triggered by various factors such as desire to succeed, encouragement, and the existence of a conducive environment. The motivation to learn is an essential element in the learning process that will help students reach their goals and achieve their learning objectives (Uno, 2012).

Learning motivation is a vital component of a student's academic success that can be triggered by various factors such as their desire to succeed, expectations, and

rewards. Motivation to learn is a non-intellectual process that helps people develop their passion for learning (Sardiman, 2010). It can be triggered by the desire to learn and the spirit to learn.

According to psychologist Abraham Maslow in (Handoka and Reksohadiprodjo, 1996), the human needs are physiological needs that are related to food, water, shelter, oxygen, and sleep. Social needs are defined as the desire for closer interaction with others and the sense of security. The need for appreciation is a desire to be recognized and rewarded for one's achievements. The need for self-actualization is a major factor that influences a child's development. It is also the reason why competitive attitudes are important in a child's development. In elementary school, the need for self-esteem seems to dominate. At that age, children start to realize their potentials. Competition among students is a sign of the desire to become the best. It's also a way to achieve self-actualization. Developing a positive motivation helps students reach their goals and desires.

Teacher should create motivation to learn by helping students to achieve their dreams and goals. This should happen through the use of various tools and methods. One of the most effective ways to improve a student's learning motivation is by using instructional media. This article talks about how to improve a student's learning motivation by using various media. After studying various media in learning that have been developed and applied in the world of education, then possible media can be used for the achievement of improving student's learning motivation, especially, grade 5 of elementary school.

The purpose of this research is to find out how virtual media can improve the motivation of students to learn math subject. The specific objective of this research is to find out how virtual media can motivate grade 5 elementary school students.

Research Methodology

This is a class action research design, observation aims to monitor the suitability of the use of virtual learning media in the learning process of mathematics. Data collection techniques include but are not limited to: observation, documents, questionnaires, and post test documentation. This study aims to improve the student learning motivation through virtual media.

In each cycle, students are given a Questionnaire. It is compiled using the Likert scale. The score is computed by asking students to answer multiple questions. Pemberian score is done on answers to questions, both on the virtual media (variable X) as well as increased motivation to learn (variable Y).

Total motivation score is calculated by taking the number of points indicated by the total motivation instrument. It is used to evaluate the level of learning motivation. That is, total motivation instrument is 26 points statement, the highest score is $30 \times 5 = 150$. While the lowest score $30 \times 1 = 30$. To determine the criteria of assessment of learning motivation consisting of very good, good, enough, less and very less.

The motivation and student responses to the use of virtual media in mathematics learning were analyzed using descriptive and inferential statistics. The inferential statistics used in this study were the one-way ANOVA and t-test Dunnet. ANOVA is a statistical procedure that tests the average comparisons of various data sets. The data analyzed in this study were collected from various sources. A homogeneity test was performed prior to the ANOVA test. If the test showed the average difference between the groups, then a follow-up test using t-test would be conducted to test the difference between the two groups.

Results and Discussions

Table 1: Percentage response on student motivation to learn math with virtual media

Motivation factors	Motivation aspects	Mean score	Percentage
	Need	3.52	67.8
	Interest	3.30	62.5
Intrinsic	Curiosity	3.21	65.2
	Pleasure	3.36	69.2
Extrinsic	Learning goal	3.71	74.4
	Explanation reward	3.60	72.0

From Table 1 above it is seen that the dominant intrinsic motivation is the need with an average of 67.8% and the highest percentage of extrinsic motivation affecting student learning is the clarity of learning objectives reach 74.4%. Motivation that got the lowest average score was interest (62.5%). The percentage of student's motivation to study as a whole reached 67%. The student's motivation for learning is still low when it has not reached 75% during the first phase. This becomes the researcher's note for improvement.
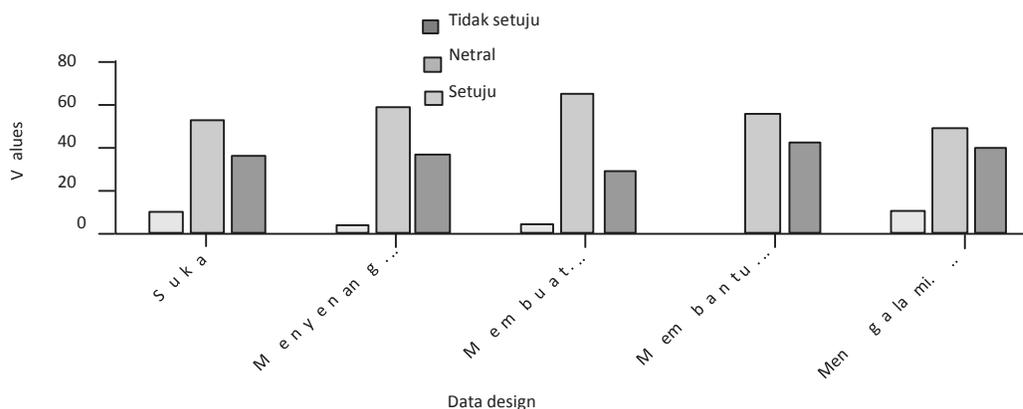
Fig. 2: Students learning motivation in the first phase

The process of learning data processing with virtual media in the first phase, students who like the lesson of data processing and happy to be taught with virtual media equal to 36.67%. As many as 30% of students are eager to use virtual media during their learning data processing. As many as 13 students or 43.33% agree that the use of media helps in learning. While those who feel difficulty when learning data processing with virtual media are 40 %. Learning motivation is 78.77, while learning completeness is 76.67%. There are 33 out of 40 students who have complete study.

This second phase shows that the learning completeness has improved significantly compared to the previous phase. Another reason why students are motivated to learn is that they can use virtual media while they are in class. Through the guidance and direction of their teacher, students are able to overcome their initial difficulties while playing a game with virtual media. This increases their understanding of mathematics. In second phase, student learning motivation has increased compared to phase one with an average of 75%. The most common factor that influences student learning is pleasure. The highest percentage of student learning pleasure is 79%. Motivated by curiosity is the lowest percentage 70%. In the second phase, the outline of student learning motivation in mathematics learning activities have increased. In the second phase, the most dominant response by students was happiness regarding learning mathematics. This activity increased when compared to the first phase.
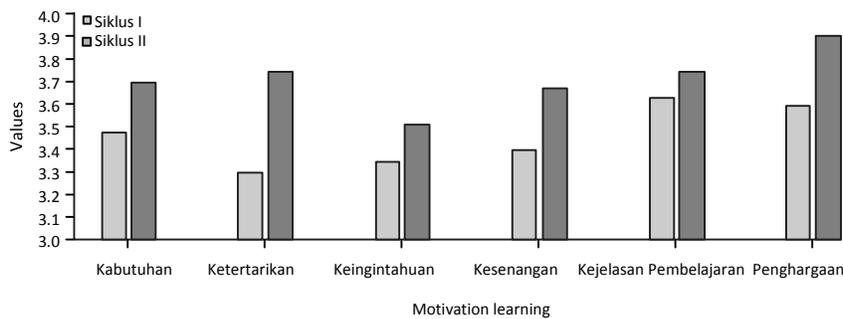
Fig. 3: Comparison of the mean of learning motivation score in the first and second phases

In fig 3, Students who have increased but not maximally desire to learn by using virtual media was 66.67%, likes lesson processing data 73.3% and usage of media useful to help executed 70% learning. The researchers analyzed the results of student tests carried out in second phase of the Learning Evaluation Program. They found that the participants' mastery of the test requirements was at least 75%. The development of a contextually based handout is analyzed through two phases, which are validation and small group test. The goal of the tests is to measure if the product can be utilized in real world conditions. Questionnaires were given to subject matter experts and media, each having a number of 18 statements, each statement has the highest score worth. The results of the small group trials conducted in 8 students' grade 5 revealed that the average score was 3.52 with very good category. Percentage of contextual based handout feasibility 88.02%. The results of these experiments show that the context-based handout can be utilized to test the effectiveness and practicality of a field or group of studies.

Contextual-based handouts can be used in learning to evaluate their effectiveness and practicality. They can also be used in small group trials to determine their usefulness. The practicality of learning can be observed through the observation of how learning activities are carried out in the classroom. The results of the experiments conducted in the class revealed that the students scored an average of 3.74 in terms of good category. The effectiveness of learning through the use of teaching materials can be seen in experimental classes conducted in 5a (experimental

class using contextual based handouts) and 5b (control class without using contextual based handouts). The learning results of students of the cognitive domain are derived from their pretest and posttest scores.

In the experimental class, about 30 students followed the pretest and got into the final exams with minimal exhaustiveness Criterion (KKM) 75 resulted 11 students complete and 19 students unfinished with an average of 61.5%. After the introduction of the conceptual-based handout, the number of students who followed the posttest increased significantly. As a result, the number of unfinished students significantly decreased. In the experimental class as many as 30 students who followed the posttest with Minimum Exhaustiveness Criterion (KKM) 75 resulted 26 students complete and 4 students unfinished. Based on calculations with significant test for posttest value, it obtained ttable 2.024 and tcount 4.743. Thus, it can be concluded that tcount is bigger than ttable then Ho is rejected, so, Ha is accepted, so it can be concluded that there is significant difference of learning result by using contextual based handout on social learning, theme beautyof my country, subtheme natural beauty of my country. It can be concluded that the learning result was significant because of the context of the question.

Learning motivation is a process that students use to improve their behavior. It involves developing and sustaining positive expectations and behaviors that are related to academic success. The significance of learning motivation was determined by analyzing the degree of satisfaction students felt after completing their studies. They were also able to identify their learning environment as conducive. The study revealed that the student's learning motivation changes depending on the phase of learning that he or she goes through. The findings indicate that the motivation of students varies significantly from phase 1 to 2. The average percentage of score that shows how much learning motivation a student has is lower than that of his peers in cycle 1. Mathematics learning increases student learning motivation. This is

evidenced by the fact that after implementing this process, students' learning motivation increases. An increase in motivation to learn can help students develop a deeper understanding of data processing materials. This can motivate them to complete their assignments and achieve their goals.

The implementation of virtual media has increased the student's motivation. The results of the student's surveys revealed that many of them agreed with the statement of the main aspects of their learning. This can be seen from the results of questionnaires of students with aspects of needs, interest, curiosity, pleasure, clarity of purpose, learning and appreciation that the majority respond to agree on the statement of these aspects. Processing data using virtual media can increase student learning motivation.

With the increasing popularity of virtual media in classrooms, it has been stated that it can improve the motivation of students in math lessons. This benefit can be utilized for a short time to increase the student's interest and knowledge. With the help of virtual media, students can learn and improve their skills in various ways. It can also motivate them to achieve their goals. In the first stage of learning, students still did not respond to virtual media. This is because their adaptation to the media still tends to be introductory. The student's initial ability is still low, which means it takes a long time for teachers to process the data presented. Teachers encourage more students to ask questions for students to understand the material presented. The effort was successful, as evidenced by the increasing number of students who say "yes" to the virtual media processing. The second cycle student response shows a good response. Most of them responded well to the Mathematics delivered through virtual media, although, some students still have difficulty using virtual media. This is because the use of virtual media is new for the students.

Conclusion

Mathematics learning through virtual media has increased student motivation. It happened after the implementation of the first phase. The difference between the scores of students' learning motivation and the data processing materials' questionnaire is evidenced by the difference in the number of students who responded to the second phase's questionnaire. This is proved by difference in result of questionnaire motivation learn student based on second phase. Based on each of the criteria of motivation, second phase has increased the average score of students' learning motivation on the data processing materials from the lowest questionnaire of the first phaseby 66-70% in second phase and the highest motivation questionnaire results 1 cycle of 72.6-79% in second phase.

The increasing level of learning motivation in students increases their learning completeness. This is a significant improvement over the previous cycle when the students were taught using traditional media. Thus, the learning motivation of learning math increases after being taught using virtual media. In second phase, students' responses are better than those of first phase. In first phase, they did not show much positive response to virtual media. In second phase, student likes to use virtual media in their learning. While the use of virtual media has increased, the spirit of learning has decreased. This is the job of the teacher to find ways to make students excited to learn.

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