

The Use of Interactive Multimedia in Improving Mathematics Learning Outcomes: The Case of the 4th Grade Students of SDN Manyaran 01 Semarang in the Academic Year of 2019/2020

Nurmawati^{1*} Masduki, Lusi Rachmiazasi² Prayitno, Edy³
 Dartani, Maria Yustina Rensi⁴

¹*Open University of Semarang, Mathematics Department, Semarang, Indonesia*

²*Open University of Semarang, Mathematics Department, Semarang, Indonesia*

³*Open University of Semarang, Mathematics department, Semarang, Indonesia*

⁴*Open University of Semarang, English Department, Semarang, Indonesia*

**Corresponding author. Email: nurmawati@ecampus.ut.ac.id*

ABSTRACT

Learning media is a medium, or forum that can be used to stimulate thoughts, feelings, concerns, and abilities or skills of learners so as to facilitate of learning, those all can help teachers in improving students learning achievement. Media of learning is always get development along with technological development. The purpose of the study was to know whether there was any significant difference in the result between the students of class IV Manyaran 01 Elementary School, Semarang towards increasing their understanding in Math, in this case Fraction who taught by using the interactive multimedia and who taught conventionally, then the study used a quantitative research approach, and the type used was an experiment. The experimental design in this study was randomized pre-test post-test design. The population in this study was fourth grade students at Manyaran 01 Elementary School Semarang. The sample in this study was class IV A as the control group, and class IV B as the experimental group. The sample in this study was taken by cluster random sampling technique. In this study both groups were given initial pretest to find out the initiate state. Furthermore, both of groups were treated by using a different learning model. Experimental group was taught by using interactive learning media, while control group was taught conventionally. After learning was complete, both groups were given the same post-test. The result found that the experimental group who given treatment by using interactive learning media got higher results than the control group, where the mean score of the experimental group was 74.88, while the mean score of the control group was 64.32. Based on the result above, it was indicate that the students of Manyaran 01 Elementary School Semarang was more comprehend in learning fraction by using interactive learning media (multimedia) better than conventionally, since learning fraction by using multimedia can build their creativity power, and increase their understanding in math.

Keywords: *mathematic, multimedia, fraction*

1. INTRODUCTION

Mathematic is one component of a series of subjects that have an important role in education that it taught in school from grades I to XII. It is one of the field of study that support the development of science and technology. Mathematics contributes greatly, starting from the simple to the complex, from the abstract to the concrete for solving problems in all fields. Generally, learning mathematics is not fun for the majority of learners as it contains specialized knowledge that requires analytical thinking. The importance of mathematics in this life, however is not in tune with students' perception on it., since most students views toward mathematics as a difficult subject, boring, scary and often causes problem in learning. Such students'

perception cause learning outcomes to be less satisfying. Apart from that, the reality that occurred in the field shows that an interesting learning media to support mathematics learning is not available yet adequately. Most available learning resources are in the form of textbooks, and teachers tend to use the conventional learning models in presenting the material. On the other hand, the use of information and communication that are in great demand by students have not been used as a medium in learning mathematics This causes the learning of mathematics to be less attractive , the enthusiasm of students in taking mathematics lesson is low. Lack of use of media in mathematical learning is considered as a causal factor of unsatisfactory learning outcomes.

To create a conducive situation in the teaching learning process, the teacher can use the appropriate learning media. The use of media in learning is to bridge between abstract mathematical concepts to be more concrete, so students are able to understand the material presented by the teacher. For this reason, the use of media in the teaching learning process is full needed for the achievement of learning goals optimally. In addition to be a tool in teaching learning process, media can also be a source in learning because students no longer only learn from the teacher, but also from various media that contain a variety of learning materials (Djamarah & Zain, 2006). Media education in general, is a teaching and learning tool. Everything that can be used to stimulate thoughts, feelings, concerns and abilities or skills of learners so as to facilitate the process of learning.

2. LITERATURE REVIEW

2.1. Mathematics

Mathematics is the science that deals with the logic of shape, quantity and arrangement. Math is all around us, in everything we do. It is the building block for everything in our daily lives, including mobile devices, architecture, art, money, engineering, and even sports. Mathematical science deals with describing and analyzing quantities, space and forms, changes and relationship, as well as uncertainty. It is a set of knowledge associated with numbers and forms that allow and structure reality, analyze it and obtain information to value it and make decisions, is identified with deduction, induction, estimation, approximation, probability, precision, rigor, safety.

Our daily life is surrounded by all these elements forming part of our culture and individuals must be able to appreciate and understand it. It is not only contributes to a greater understanding of reality but also to the integral development of children. Mulyana (2004) stated that mathematics, in addition to be able to broaden the horizon can also develop awareness about the value of discipline, balance, creative and innovative.

2.2. Media on Learning

Today, learning is not simply a passive response to instructions' s delivery. Rather, learning is an active, constructive, cognitive, and social process by which the learner strategically manages available cognitive, physical, and social resources to create new knowledge by interacting with information in the environment and integrating it with information stored in memory. Learning is process to acquire knowledge. It needs hard work and sometimes will make students frustrated and get bored, so that they lose attention and to make teaching learning process is not a new thing. Many teachers know that media will be helpful. Media give students something new, but not all of teachers know how to implement it correctly, so sometimes media disturb learning process instead of helping students in learning process. Media can be used effectively in formal situation where students are working independently or teacher is working with other group of students. Media play a significant role in the

education of students with exceptionalities children with disabilities in particular need special instructional treatment which is supplemented with adaptation and specially designed media for effective instruction of such students. The most common use of media in an instructional situation is for supplemental support of the instructor in the class room to enhance learning. (Heinich, et al.1996)

Teaching and learning are considered complex processes, influenced by different multiple factors, including use of media or instructional aids, which results active involvement of learners and makes teaching more interactive. As Sudjana and Ahmad Rivai state (1991:2) that the benefit of media in learning are : First, learning will attract students more so that it can foster students' motivation Media can be used in almost any discipline to enhance learning, both in class, and also for out of class assignments. Second, the subject matter will be clearer so that it can be better understood by students and enables students to achieve learning goals better.

2.2.1 The Advantages of Using Media

Media offers both cognitive and affective experiences. It can provoke discussion, an assessment of one's values, and an assessment of self if the scenes have strong emotional content. The use of media sources help connect learners with events that are culturally relevant. As a result, a positive consequence of utilizing media is that instructors must keep their materials and examples up to date.

So far, the advantages of media for students are:

1. Popular media are a familiar medium to students that helps gain attention and maintain student interest in the theories and concepts under discussion. Students can see the theories and concepts in action. In more than a figurative sense, theories and concepts leap from the screen.
2. Students can hone their analytical skills by analyzing media using the theories and concepts they are studying.
3. The use of media in the classroom enabled students to see concepts and new examples when they are watching television, listening to music, or are at the movies with friends.
4. Students can experience worlds beyond their own, especially if the media is sharply different from their local environment.

2.3. Multimedia

One of the most rapidly changing and exciting areas of education in the world today is the development of computer-based teaching materials, especially interactive multimedia programs that run on personal computers. These new technologies offer students and teachers access to materials as never before. Through the condensed storage capabilities of computers, multimedia can deliver large amounts of information in ways that make it manageable, approachable, and useful. And by making it possible to access illustrations and photographs, sound and

video, as well as large amount of text, interactive multimedia programs present learning information to teachers, students, and scholars in newly engaging and meaningful ways. The integration of multimedia

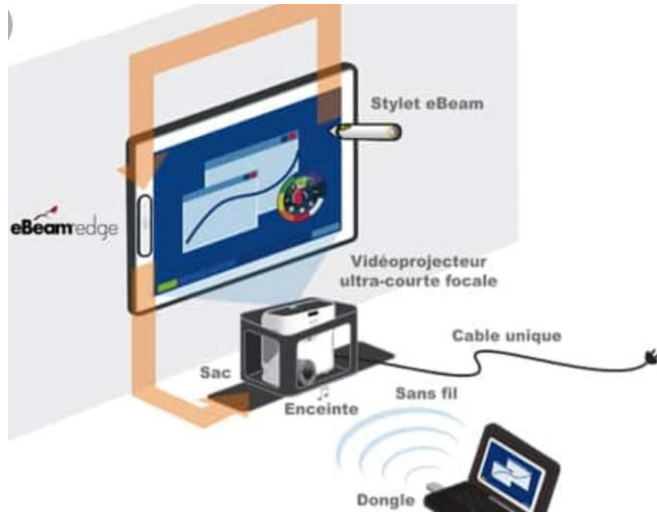


Figure 1 Interactive Multimedia –based Learning Media

programs into libraries and classrooms promises not only to change the kinds of information that is available for learning, but the ways that learning takes place.

Multimedia is a powerful and efficient source for acquiring learning resources. Furthermore, interactive multimedia can be a powerful learning and teaching tool because it engages multiple senses. Students using multimedia are reading, seeing, hearing, and actively manipulating materials. Multimedia has a significant future in education. As a new medium, some of the instructional design that accompanies materials development is pioneering and innovative. Mayer (2002) suggested that students learn more when they're being provided with pictures along with supporting words or explanations that are being discussed by the teacher instead of providing pictures along with texts and being supported by the teacher's own words.

2.3.1. Interactive Multimedia

Interactive multimedia serves as an alternative medium of instruction to the current way of learning (Kassim : 2014). This emphasizes that multimedia bears in interactivity and discovery among the students. It allows the learners to explore more explanations and information about their lesson on their own due to the interactivity the multimedia it offers.

Interactive multimedia is defined by three criteria:, those are:

1. Interactive Multimedia is any package of materials that includes some combination of texts, graphics, still images, animation, video, and audio;

2. These materials are packages, integrated, and linked together in some way that offers users the ability to browse, navigate and analyze these materials through various searching and indexing features, as well as the capacity to annotate or personalize these materials;
3. Interactive multimedia is always" reader-centered." In interactive multimedia, the reader controls the experience of reading the material by being able to select among multiple choices, choosing unique paths and sequences through the materials.

2.3.1.1. Interactive Multimedia In Learning Activity

The interactive multimedia, by definition, has the capacity to deliver large amounts of materials in multiple forms, and to deliver them in an integrated environment that allows users to control the reading and viewing experience. These characteristics and virtues translate into benefits in an educational environment, they are:

1. Multimedia programs bring to education the extraordinary storage and delivery capabilities of computerized material. This is especially important for schools, libraries, and learning institutions where books are difficult to obtain and update.
2. Interactive multimedia programs enable the user to manipulate these materials through a wide variety of powerful linking, sorting, searching and annotating activities.
3. Interactive multimedia programs usually integrate some combination of orientation tools, such as timelines, graphs, glossaries, and other pedagogical guide

3. METHOD

3.1. Objective of the Study

Based on the observations, for the past two years in 4th grade at the target research location, the results of mathematics learning are still in below standard. The fact above shows that most students still get difficulties in understanding mathematics. There is a widespread difficulty for the students in understanding mathematics and some teachers do believe that learning media, especially in teaching mathematics fraction indeed give a lot of contribution in teaching process. And to find out the extent of the contribution of interactive multimedia in learning mathematics, this research was conducted.

Purpose of the study are to describe the use of interactive multimedia- based learning media to 4th grade students of SDN Manyaran 01 Semarang in improving mathematical learning and to explain the level of students' success in mathematics.

The focus of the study is related to the effectiveness of interactive multimedia as a medium in mathematics learning, and the problems are formulated as follows:

1. Is there any significant different between the students' understanding mathematic who are taught by using interactive media in mathematic learning.

2. What contribution can interactive multimedia give to the students' understanding of mathematics?

3.2. Procedure

The participants for the study were the elementary students of the 4th grades. There were 50 participants who take a part in the study, those were 25 students of class IV A, and 25 students of class IVB . Participants were divided into two treatment groups. Class IV A signed as the experimental group and class IVB signed as the control group. The experimental group was taught by using interaction multimedia and the control group was taught conventionally for the same materials of mathematics. Each group was assigned to do the same test, containing sections which consist of mathematics material. The topic taught was fraction. The data was carried out through interview, and test.

Pre-test was given before the experiment, and post-test was held immediately after the experiment was over. The Null hypothesis of no significant differences were constructed and tested, and then one-tailed t-test was used to compare the score of both groups and to analyze the hypothesis. The alpha level was set at .05 for the statistical tests.

3.3. Target

Following illustrated the theoretical and practical benefits from the study

3.3.1. Theoretical Benefits

1. Contributing ideas for developing curriculum for schools that are used for research
2. As a scientific work, this research is expected to provide input for development of science regarding the use of multimedia-based learning media to improve mathematics learning outcomes in the primary school.
3. As a reference in subsequent research studies relating to elementary school mathematics learning media

3.3.2. Practical Benefits

1. For teachers, it can be an inspiration in applying multimedia learning into mathematics learning activities, especially towards improving primary school students' learning outcomes, in addition to increasing teacher insight in the field of education, especially in the selection of instructional media that can be published in class so that students feel a more pleasant atmosphere.
2. For students, it can increase the activity of learning and avoid boredom and antipathy towards mathematics subjects.
3. For institutions, as an effort to improve the quality of education, as to produce the effective learning and goals that are expected to be achieved

4. DISCUSSION

After finishing the whole experiment for eight weeks, and getting the results for post-test scores of both group, then the data are processed. From the computation ,it was

found that the mean score of the experimental group was 74.88, while the mean score of the control group was 64.32. It was also found out that the standard deviation of the mathematics scores of experimental group was 6.379 and its variance was 40.6933 while the standard deviation of the mathematics score of control group was 6.921 and its variance was 47.8933.

From the data above, it can be seen that the mean score of the experimental group was higher than the control group (74.88 > 64.32) so the standard deviation of the experimental group was also higher than the control group Therefore it was conclude that interactive multimedia can give the contribution to the students' understanding to mathematics, since the students who taught by using interactive multimedia got higher scores than the students who taught conventionally.

5. CONCLUSIONS

Based on the findings, it can be concluded that:

- a. There is any significant difference between the student's understanding of mathematics when they were taught by using the interactive multimedia-based learning media rather than taught conventionally since the results indicated that the experimental group score is higher than the control group in where the mean of experimental group was 74.88 while the mean of control group was 64.32.
- b. The uses of interactive multimedia in teaching mathematics indeed give great impacts to the students' understanding of mathematics . The experimental group showed an improvement in performance and this improvement was statistically significant since the students got better achievement intheir mathematics understanding by using interactive multimedia-based learning media.
- c. Most of students agreed that multimedia presentation is a good contributor totheir creativity in performance tasks. With the presenceof graphics,audio and customized templates, the students absorb the lessons in a more creative manner.Their creativity thinking skills developas well. Result showed that multimedia learning encourage to learn more.

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