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RESEARCH ARTICLE

Improvement of Student Learning Results Using Animation Media in Material of Cell Division for Students in Class IX-D of SMPN 3 Surabaya

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ABSTRACT

The development of the education system in Indonesia a teacher is required to be able to develop insight and creativity. As a teacher facilitator must be able to be creative and have various strategies that can be used in the learning process in the classroom. Teaching strategies are a way for students to master the subject matter to the fullest. But the reality in the field is not as smooth as planned. In fact, many students cannot master the subject matter, especially Biology subjects, there are still many children whose grades are under the KKM (KKM 80).The purpose of conducting classroom action research using this animation media is to improve the mastery of the material of cell division. The procedure for class action research used refers to the methodology of action research, namely (1) planning, (2) implementation of actions, (3) observation and evaluation, (4) reflection, carried out in 2 cycles. Media animation is a means of delivering material using technological advances so that it can be more fun. The results of cycle 1 show that student learning outcomes in making questions and their solutions are 84.62%, and the results of the exercise in cycle 2 students' skills reach 92.86%. While the average test result of cycle 1 is 67.00 and the average test result of cycle 2 is 86.00. This shows an increase in student learning outcomes. From this class action research, it can be concluded that the animation media can improve the learning outcomes of mitosis and meiosis cell division for students of class IX D of SMPN 3 Surabaya Odd Semester 2018-2019 Academic Year.

1. INTRODUCTION

The facts in the field show that the value of Biology subjects in class IX D on the concept of cell division is still low, this is evidenced by the average value of daily test results under the minimum completeness criteria (KKM). The low learning outcomes are caused by several factors directly involved in the learning process including the factors of teachers, students, teaching methods of learning media, educational facilities and infrastructure used and learning materials. Biology learning process on the concept of cell division teachers still apply conventional learning models namely lecture methods that have characteristics 1) teacher-centered, 2) emphasis on knowledge recipients, 3) less varied, 4) less empowering all potential students, 5) unattractive use of media, 6) using monotonous methods, because the teacher is dominant as the center of learning resources (teacher centered).

With this method shows that students are less enthusiastic in accepting lessons and causing saturation. In the learning process sometimes students do not understand what is explained by the teacher and want to know more about what actually happens in the cell division, for example how is the process of cell division? Their limitations have never been seen directly so that learning media are needed to explain what actually happened, and attract students' attention to learning. The selection of media is adjusted to the level of development of the child and the concepts that will be taught so that students more easily understand the concepts to be taught and not boring.

Classroom Action Research (CAR) is very necessary to overcome the learning process that results in less value and less enjoyable learning processes. For this reason, the authors want to examine the use of animation media to improve student learning outcomes in class IX D on cell division material.

There are so many kinds of media, including animation media which is one example of the use of technology that supports the educational process, with this media expected to increase students 'enthusiasm and attention to learning and be able to instill the same concepts and meanings in

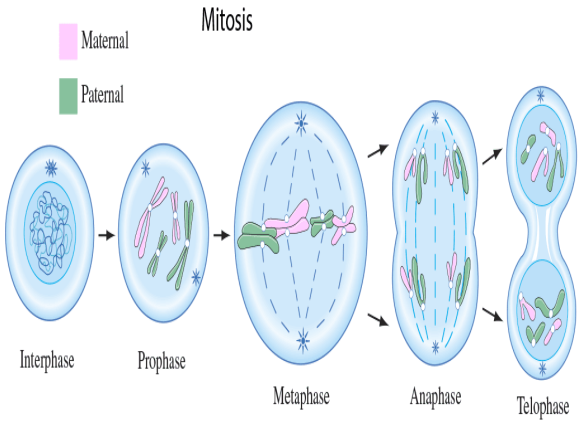
students' brains compared to other media such as images. In essence it is not the learning media itself that determines learning outcomes. According to Harsidi (2009), the success of using learning media in the learning process to improve learning outcomes depends on (1) the content of the message, (2) how to explain the message, and (3) the characteristics of the recipient of the message. Thus in choosing and using media, these three factors need to be considered.

If the three factors are able to be delivered in the learning media, it will certainly give maximum results. According to Bandono (2003) animation is an option to support the learning process that is fun and interesting for students and also strengthens motivation, instilling understanding in students about the material being taught. Animation is basically a series of images that form a movement has advantages compared to other media such as static images or text. The advantage of animation in this case is a moving image is the ability to explain an event systematically at each time of change. This is very helpful in explaining the procedure and the sequence of events that are sometimes difficult to imagine. And the use of animation can be arranged based on our will, for example slowed or repeated if it is felt necessary.

Learning Media is a physical means to convey learning content / material such as: books, films, videos and so on (Sadiman, et al., 1977). Learning media are a means of communication in print and listening, including hardware technology. Animation is a moving image shaped from a set of objects (images) arranged in an orderly manner following the flow of motion that has been determined in each time count increment that occurs. The image or object referred to in the definition above can be a picture of humans, animals, or writing. Learning outcomes are the most important part of learning. Arikunto (2005: 3) defines student learning outcomes as essentially a change in behavior as a result of learning in a broader sense covering the fields of cognitive, affective, and psychomotor.

According to Purwanto (2018), cells are the smallest unit of the body of an organism. Humans are multicellular organisms, which means they are composed of many cells. The number of human cells when they were young is certainly different when humans are adults. Because human cells that initially keep on doing a little division so that the number is increasing. Cell division is an important process for the survival of every organism both unicellular and multicellular.

There are 3 reasons why cells in living things have to do division, namely: to experience growth, to replace damaged cells, and to reproduce. Cell division in living things occurs in cells that already exist in the body of the living thing itself. So the cell theory was born called omnis cellula a cellula, which means that all cells of living things come from pre-existing cells. This theory was put forward by Rudolf Virchow in 1855.



Picture 1 Mitosis Cell Division

Actually there are 3 types of cell reproduction, namely Amitosis, Mitosis, and Meiosis (Purwanto, 2018). Amitosis is direct division, without going through the stages of division. Examples of this division are single-celled living things, such as bacteria, amoeba, paramecium, euglena, and blue-green algae. Mitosis is cell division which only undergoes a process of division. There are 4 phases in one stage, namely prophase, metaphase, anaphase, and telophase.

Feature prophase:

1. DNA thread (chromatin) turns into a bar (chromosome).

2. The occurrence of duplication of chromosomes thus forming chromatids.

3. The core child fuses (disappears)

4. The core membrane melts.

5. In animals seen centrioles toward the opposite pole.

Metaphase characteristics:

1. Chromatids or chromosomes lined up in the plane of division / middle / equator.

Characteristics of anaphase:

1. Chromatids are separate and each chromosome goes to the opposite pole.

Telophase characteristics:

1. The chromosome changes back to chromatin.

2. The core child is formed again.

3. The core membrane is formed again.

4. There is a process of cell division (cytokinesis).

In the cell cycle, in addition to the four stages there are other stages, namely the interface. Interphase is indicated by:

1. Cells experience growth and development.

2. Metabolism takes place actively, such as protein synthesis and respiration.

Meiosis is cell division consisting of two processes of division. There are 4 phases in one stage, namely prophase, metaphase, anaphase, and telophase. So, later there will be Meiosis I which consists of prophase I, metaphase I, anaphase I, and telophase I and there are Meiosis II

consisting of prophase II, metaphase II, anaphase II, and telophase II.

2. METHODS

This research was taken at SMP Negeri 3 Surabaya, located in Surabaya, where this place is also the place where researchers carry out teaching assignments. The reason the researchers chose this place was that the location was close to the house so that it was easy to reach and researchers were now one of the teachers who taught at the school making it easier for researchers to carry out this classroom action research. The research was conducted for two (2) months starting from July to August 2018. The research subjects were students of class IX D of SMP 3 Surabaya in the academic year 2018 / 2019. The research was conducted in 2 cycles.)

Based on the initial reflection carried out classroom action research (PTK) through stages or procedures of planning, implementation of actions, observation and evaluation, and reflection in each cycle 1

Cycle 1

Cycle 1 consists of:

a. Planning
   1. Conditional documentation includes a list of values and observation sheets
   2. Identification of problems, the problem faced in this study is the lack of optimal student
   3. learning outcomes
   4. Make a learning scenario
   5. Make an observation sheet to see the learning process in the class.
   6. Prepare a learning plan.
   7. Make an evaluation tool to determine the power of absorbing student learning outcomes.

b. Implementation of Action;
   1. Mitosis and meiosis cell division material are given (the first hour) by explain concepts through class presentations.
   2. Then a cycle 1 test is carried out.

c. Observation
   1. Prepare an observation sheet to monitor student activities during the learning process.
   2. Collect data on student learning outcomes, both pre-cycle data, training and cycle 1 test results.

d. Reflection

   The results of the above research can be analyzed by measuring both quantitatively and qualitatively.

Cycle 2

Based on the results of reflection in cycle 1 if there is no increase in learning outcomes, it is expected that the second cycle will take the following steps

a. Planning
   1. Identify problems
   2. Action plan.

      The planned action is through media animation in the learning process as an effort to improve learning outcomes.

b. Implementation
   1. Prepare the next learning plan.
   2. Evaluating student learning outcomes through cycle 2 tests.

c. Observation, including reviewing the results of observations in the cycle 1. Observation must really re-record the results of observations in cycle 1.

d. Reflection

   After conducting cycle 1 research and cycle 2, analysis of accurate data is obtained, from the results of research the teacher can implement it for reflection whether the results of research using animation media can be applied in learning to students.

The source of the research data is class 3 students of SMPN 3 Surabaya. The data obtained are quantitative and qualitative data consisting of:

a. Results of daily repetition of the subject of cell division
b. Cycle 1 test results and cycle 2, are used to determine the improvement of student learning outcomes.
c. Observation results on implementation or teaching and learning.

How to collect data:

a. The results of the training were obtained from research on the exercises the students worked on.
b. Learning achievement is obtained from the score or test score.
c. The CBC situation when the action is carried out is obtained from observations made by the researcher.

The measure of the success of implementing classroom action research is that if the ability of students to classically master cell division material can reach a class average of $\geqslant$ 80.

8. RESULTS AND DISCUSSION

The study was conducted on class IX D students of SMPN 3 Surabaya in the academic year 2018/2019. Action research in the class, carried out in two cycles. From cycle 1 to cycle 2 indicators of success have been achieved. The indicator of success in the study is if the average test results are $\geq$ 80. Before the action is held the pretest is held to determine the extent of students' ability to master cell division material.

From the results of the test obtained data on the average value of pre-cycle 1 is 62.50. In the pre cycle 2 test there was an increase in student learning outcomes with an average of 67.75.

In cycle 1 the teacher has given special action to students by doing independent exercises, however the results of the first cycle test have not indicated the success of this study even though there is an increase in the average score of the test results.

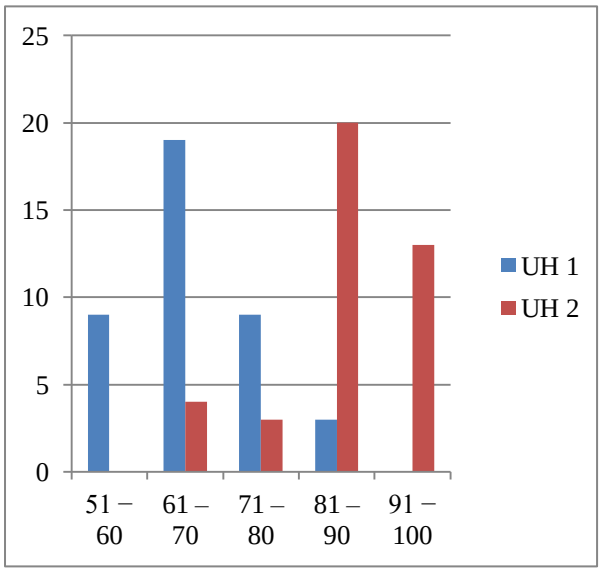
Cycle 2 can be seen from the results of independent training 1 students' skills in making questions and completing them in the first cycle of 84.62% in the second cycle of 92.86%. Thus there is an increase in students' understanding of the material provided.

Table of Recapitulation of Independent Training Results Data

Cycle	X	Percentage
1	8	84.62
2	8	92.86

Information :

X = Number of groups are skilled at making questions and answers.The number of all groups in class IX D = 8 groups.



Block Chart of Daily Test (DT or UH) Results at Cycle I and Cycle II

From the results of the test cycle 1 the lowest value is 55, the highest value is 90 and the average value is 67.00 while the second cycle is the highest value of 100, the lowest value is 55 and the average value of the class reaches 86.00. From the observer sheet to the teacher's ability to teach, the average score in cycle 1 was 4.64 and in cycle 2 was 4.98, while the maximum score was 5. The effectiveness of students in cycle 1 of active students was 85.71% and in cycle 2 is 100%.

The results of reflection on the implementation of cycle 2 are as follows:

Courage of students in asking questions, expressing opinions, creativity of students, understanding students better and appreciating the opinions of friends in one group which can then be developed to respect the opinions of other groups. Students are more confident and begin to work on problems, both as homework and test questions. And the indicator of success has been achieved (≥ 85%). Student learning achievement is quite satisfactory, that is from the class average of 44.30 in the pre-cycle 1 and 63.50 in the pre-cycle 2.

Student achievement in cycle 1 is 67.00 and the percentage of student learning outcomes is 67.50%, while the achievement of student learning outcomes in cycle 2 is 86.00 and the percentage of student learning outcomes is 87.50% Thus the indicator of success has been achieved. Based on the discussion of the results above, it turns out that the animation media can improve mastery of mitosis and meiosis cell division material in class IX D students of SMPN 3 Surabaya.

9. CONCLUSION

The conclusion that can be stated in this research is that animation media can improve learning outcomes and mastery of cell division in class IX D students of SMPN 3 Surabaya.Based on the results of these studies, the author tries to give advice as a consideration in teaching the subject of cell division as follows: 1. Biology teachers should actively and creatively be able to use effective ways to improve student learning outcomes. 2. Class actions that apply in this study can be used as an alternative for teachers in the process of teaching and learning activities.

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