

## UTILIZATION OF TISSUE CULTURE VIDEOS TO IMPROVE STUDENT BIOLOGY LEARNING OUTCOMES

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### ABSTRACT

This study aims to improve student biology learning outcomes on tissue culture by using learning videos in Class XI IPA-2 SMA Negeri 1 Batang Kuis T.P 2018/2019. This research consists of the cycle I and cycle II. Each cycle consists of 4 stages, namely, planning, implementing actions, observing, and reflecting. The subjects of this study were students of class XI IPA-2, totaling 32 students. The data collection tool used is a learning outcome test. Based on the pre-test conducted on 32 students, there were 16 (50%) students who got low learning outcomes (unfinished) and as many as 16 students (50%) who were included in the complete category. Then, eight students (25%) were in the incomplete category and 24 students (75%) during the first cycle. Furthermore, during the second cycle, the students who got low learning outcomes were two students (17%), and those included in the complete category were 30 students (93%). There has been a significant increase. Thus it can be concluded that using tissue culture videos can improve student biology learning outcomes in class XI IPA-2 SMA Negeri 1 Batang Kuis T.P 2018/2019.

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## INTRODUCTION

The development of science and technology increasingly encourages renewal efforts in using technological results in the learning process. Teachers are required to use the tools that the school can provide, and these tools may be in accordance with the developments and demands of the times. Teachers can at least use cheap and efficient tools even though they are unpretentious and straightforward but can be used repeatedly and are a must to achieve the expected teaching goals, especially in national education.

The benefits of using video media in the student learning process include: learning will be more interesting, lessons are easier to understand, teaching methods will vary, students can do more learning activities because not only listen to teacher descriptions but also other activities such as observing, conducting demonstrations, and exhibition.

In biology, especially on the structure and function of plant tissue, there are sub-chapters on totipotency and tissue culture. In the discussion of tissue culture, it is better if students are brought to a tissue culture laboratory. However, not all schools have tissue culture laboratories, so learning about totipotency and tissue culture sub-chapters should take students to the laboratory and have not used effective media, so students are forced to envision tools, materials, and processes in tissue culture techniques.

The current learning process has not yet optimized the use of media (Brata, 2015). In delivering the sub-chapters of totipotency and tissue culture on the material on the structure and function of plant tissue, the teacher only uses blackboard and projector media which displays images from the internet, but the process in tissue culture techniques cannot be shown. This causes the low absorption of students in the material being taught and affects student learning outcomes. It can be seen based on the results of daily tests of class XI IPA-2 students of SMA Negeri 1 Batang Kuis for the primary material of the structure and function of plant tissue, especially totipotent material, and tissue culture, which is still in its infancy. many below the KKM (Minimum Completeness Criteria) 78.

To increase this, there needs to be innovation in the learning process, one of which is using network culture video media. Based on the description above, the authors are interested in conducting a learning innovation entitled "Use of Network Culture Video Media to Improve Biology Learning Outcomes for Class XI IPA-2 Students of SMA Negeri 1 Batang Quiz 2018/2019 Academic Year".

Learning is an activity that a person does intentionally and in a conscious state to gain a new concept, understanding, or knowledge, and with it can form a change of self both with the environment and other individuals (Wandini & Maya, 2018). James O. Whittaker in Aunurrahman (2010) suggests learning is a process in which behavior is generated or changed through practice or experience. Aunurrahman (2010) states that learning is gaining learning experiences, skills, and attitudes. Slameto (2003) suggests learning is a process of effort by a person to obtain a new behavior change due to his own experience in interaction with his environment. Meanwhile, Sugihartono et al. (2012) revealed that learning is a process of changing behavior due to interactions in the environment in meeting the needs of life.

Based on the understanding of some of these experts, researchers can understand that learning is not obtained practically, there is a process in its achievement, and there are positive changes that result. In this study, learning is focused on achieving learning outcomes on Totipotency and Tissue Culture material using video media.

Tangible learning outcomes can be seen from what students did that previously could not be done. In this case, there is a change in behavior that can be observed and proven by action. Following the statement of Sadiman et al. (2009), which defines "learning outcomes as a change that occurs in individuals who learn, not only changes in knowledge but also knowledge for skills, habits, attitudes, understanding, mastery, self-respect, learning individual.

Learning outcomes are indications that show students' efforts to master knowledge (cognitive) of the subject matter given by the teacher through curricular activities (homework) and test tests. The final grade learning outcomes of students measured through evaluation techniques meet the evaluation aspect and can be used as an indication of how far students have mastered the subject matter.

Learning media is one of the tools or methods used in the teaching and learning process (Setiawan et al., 2021). The word media comes from the Latin *medius*, which means 'middle,' 'intermediary,' or 'introduction.' In Arabic, the media is an intermediary or introductory message from the sender to the message's recipient. The notion of media in the teaching and learning process tends to be defined as graphic, photographic, or electronic tools for capturing, processing, and rearranging visual or verbal information. In general, educational media has the following uses: Clarify the presentation of messages so that they are not too verbalize (in the

form of written or spoken words), overcome the limitations of space, time, and sensory power, such as Objects that are too large can be replaced with reality, small objects- assisted with a micro projector, frame film, film, or image, Motion that is too slow or too fast, can be assisted by timelapse or high-speed photography.

Appropriate and varied use of educational media can overcome the passive attitude of students. In this case, education is helpful for: Generating a passion for learning, enabling more direct interaction between students and the environment and reality, and enabling students to learn independently according to their abilities and interests.

With the unique nature of each student coupled with a different environment and experience, while the curriculum and educational materials are determined the same for each student, the teacher has many difficulties when everything has to be overcome alone. This will be more difficult if the background of the teacher's environment with the students is also different. Educational media can overcome this problem by its ability to provide the same stimulus; Equating experience.

The type of Learning Media based on the technology that emerged last was microprocessor technology, which gave birth to computers and interactive activities. Based on these technological developments, learning media can be grouped into four groups: (1). Media resulting from print technology, (2). Media resulting from audio-visual technology, (3) media resulted from computer-based technology, and (4) media resulted from a combination of print and computer technology.

Print technology produces or conveys materials, such as books and static visual materials, mainly through mechanical or photographic printing processes. The media results resulting from print technology include text, graphics, photographs, or photographic presentations and reproductions. Printed and visual materials are the basis for developing and using most other learning materials ([Kustandi & Sutjipto, 2013](#)).

Audio-visual technology produces or delivers material using mechanical and electronic machines to present audio and visual messages. Teaching using audio-visual is characterized by the use of hardware during the learning process, such as film projector machines, tape recorders, and wide visual projectors. So, teaching through audio-visual is the production and use of material absorbed through sight and hearing and does not entirely depend on understanding words or similar symbols.

Computer-based technology is a way of producing or delivering material using microprocessor-based sources. The difference between media produced by computer-based technology and produced by the other two technologies is that the information/materials are stored in digital form, not in printed or visual form. Computer-based technology uses a glass screen to present information to students. Various types of computer-based technology applications in learning are generally known as computer-assisted instruction (computer-assisted learning).

Combined technology is a way to produce and deliver material that combines several forms of media controlled by a computer. Combining several types of technology is considered the most sophisticated technique if it is controlled by a computer with excellent capabilities such as large random access memory, large hard disks, and high-resolution monitors coupled with peripherals (additional tools such as videodisc players, electronic devices). hard to join in one network, and audio system).

Learning Video Media should pay attention to the following: videos must be selected to suit the learning objectives. The relationship between video programs and learning objectives, according to Anderson, is: the use of video for cognitive purposes can be used for matters relating to the ability to recognize and to provide stimulation in the form of harmonious motion. For example, regarding the relative speed of an object or objects that are moving.

Besides, to teach rules and principles. The use of video for psychomotor purposes can show examples of movement skills, such as prayer movements (in biology, such as using a microscope properly or making culture in tissue culture). Through this media, students can immediately get feedback on skills related to the movement. Video can be a compelling medium for influencing attitudes and emotions by using various techniques and effects.

## METHOD

This research was conducted at SMA Negeri 1 Batang Kuis, Deli Serdang Regency. Odd Semester research time from August to d. October 2018. The research subjects were students of class XI IPA-2 SMA Negeri 1 Batang Kuis Semester I T.P. 2018/2019, totaling 32 students (10 boys and 22 girls). Class XI IPA-2 was chosen because, based on observations from the learning outcomes obtained by students, this class is lower than other classes, indicating that students have difficulty understanding biology learning materials, especially tissue culture.

## RESULTS AND DISCUSSION

### Pre-Cycle

Before conducting classroom action research using learning videos at the initial meeting, the researcher gave a pre-test to the students. This was done in order to determine the students' initial abilities on the subject of tissue culture.

The teacher distributes pre-test questions. The form of the test used is a multiple-choice test with ten questions. After finishing dividing questions, the teacher explained how to write the answers to the questions and wrote down the name and class. Then students work on the problem. From the students' pre-test results, it was concluded that the students were classified as low. This can be seen from the students' errors in answering the pre-test questions given by the researcher with an average score of 67 students, and the percentage of completeness is only 50%. Of 32 students, there are only 16 students have passed the minimum criteria. This shows that the level of student understanding is still low.

Based on the pre-test above, it can be stated that the level of understanding of students is low because they still have difficulty in solving problems and do not understand the subject matter, namely the subject of tissue culture. Therefore, it is necessary to improve learning by using learning video media.

### First Cycle

Based on applying the implementation of learning to the material on the subject of tissue culture, using video media in the learning process can create a vibrant atmosphere to improve student understanding.

Based on the results of data analysis on the pre-test, it can be explained that the average score of students at the time of the pre-test was 67, and students who had completed learning were 16 students or 50%. Furthermore, after learning using network culture videos, the average value increased to 77, and students who completed learning were 24 students or 75%. From these data, it can be stated that using tissue culture video can improve student learning outcomes in class XI IPA-2 SMA Negeri 1 Batang Kuis T.P. 2018/2019.

After the learning was carried out, a post-test was carried out in cycle I. The post-test results in the first cycle were obtained from 32 students.

There were 24 students (75%) who passed the minimum criteria. The student's average score is 77.

This difficulty can be caused by students not understanding the teaching material on tissue culture subjects, so it takes a long time to work on just one question. Furthermore, students cheat on their friends' answers, causing a commotion in the class.

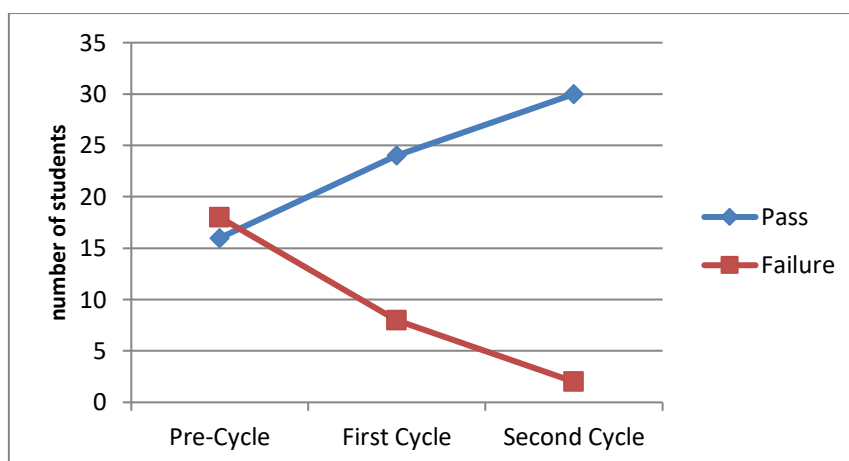
Based on the results above, it can be concluded that learning can be categorized as still low. So the problem in this study is students' low ability to work on tissue culture material questions.

### Second Cycle

Based on the results of data analysis in cycle II, it can be concluded that the students' ability to understand the subject matter increased—the increase in the acquisition of student scores where the average value reaches 87. Of the 32 students, 30 students, or 93%, have achieved completeness, and there are no students who have not achieved completeness. Thus, in the second cycle, student learning outcomes have reached completeness, so there is no need to take any further learning actions in the next cycle. In accordance with the opinion of [Kurniawati et al. \(2013\)](#) that was learning video, media can attract students' attention, increase student knowledge, increase student imagination power, increase critical thinking power, and trigger students to participate more and be enthusiastic, so that later students can be more active in the learning process. In addition, video media has the function of presenting something concrete, even though it is not in physical form. Learning by using the dual senses of sight and hearing can provide benefits for students to understand better the material explained by the teacher.

Based on the research results that have been described, the implementation of learning on the material on the subject of tissue culture using instructional video media in the learning process can create an active atmosphere to improve student understanding.

In this study, the implementation of learning has been carried out optimally and in accordance with the expected goals. This can be seen from the increase in student learning outcomes from the pretest to cycle II.



**Figure 1.** The ratio of the number of students passing and failing in each cycle.

Video media is a medium that can help students be more active in participating in learning. Based on the results of data analysis in the pre-test, cycle I, and cycle II, it can be explained that the average score of students at the time of the pre-test was 67, and students who completed learning were 16 students or 50%. Furthermore, when the test was held during the first cycle, the average score of students increased to 77, and students who finished studying were 24 students or 75%. And then, when the second cycle test was held, the average score increased to 87, and students who finished studying were 30 students or 90%. From these data, it can be stated that using instructional video media can improve student learning outcomes in class XI IPA-2 SMA Negeri 1 Batang Kuis T.P. 2018/2019.

In accordance with Anchor's research (2015), video media can attract the attention of students. This is because when using the media, students will involve some of their senses. Another advantage of using video in learning is that students not only listen to what the teacher explains but also see what facts are displayed by the teacher in the video. video media also has the flexibility to be played back according to student needs. in this case, it can increase student learning independence which can support improving learning outcomes (Brata, et al., 2020).

The results of this study are also supported by several other studies related to video media in improving cognitive learning outcomes, namely research conducted by Anggini (2015), which states that audio-visual learning media is one of the proven ways to improve participants' science learning outcomes—studied at SMPN 13, South Tangerang City. Then research by, states that the use of video media has a significant effect

on student learning outcomes because video media can be said to be more effective in the learning process, helping students to be more active, can create an interesting, fun learning atmosphere and videos are displayed can focus students' attention (Sampurna, 2017). So that students become better at understanding the material presented and obtain more optimal learning outcomes. This can happen because students are presented with moving images accompanied by sound in the video learning media to attract students' interest to follow the learning process. Reinforced by Daryanto's (2013) theory, the message to be conveyed will attract more attention, which is very important in the learning process because, with attention, there is a stimulus or motivation for each student to learn better. In addition, the use of video as a learning medium also makes it easier for teachers to provide an overview of learning materials so that the material is more explicit, not abstract, and can communicate messages quickly and significantly, impacting students' understanding faster. The results of this study are also supported by Arsyad's (2014) opinion, which states that audio-visual (video) has the advantage that it can complement the real experiences of students when they read, discuss, practice, and others. In addition, videos can also describe a process precisely, which can be watched repeatedly if deemed necessary. So learning videos can make students active in the learning process and can support the learning process that is student center.

## CONCLUSION

Based on the results of using tissue culture video media, it can be concluded that student learning outcomes taught with tissue culture video media have increased by 93%. Judging from the value of the first cycle of 77, while the second cycle became 87. This proves that video media can facilitate students in understanding tissue culture material.

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