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Video-Based Learning as a Modern Distance Learning Method for Biology

Febri YANTI*

Postgraduate students, Universitas Negeri Padang, Padang, West Sumatra, Indonesia

*Corresponding author: febriyantibio02@gmail.com

Abstract

Biology, one of the fields taught in schools, is sometimes a bit difficult to convey. In biology lessons, illustrations are needed for several topics, such as body physiology, the circulatory system, the nervous system, and digestion. Therefore, it seems that the use of learning videos in the process of teaching Biology will help students understand the lesson better. This study aimed to determine the use of basic educational videos as a tool for learning biology online. Literature was collected and compiled thoroughly to conduct this study. Studies have shown that basic learning videos can help teachers develop new methods for teaching biology in the classroom. The results of the study show that using basic learning videos as a medium for distance learning in biology can have a positive impact. It can improve cognitive skills, and learning performance, develop interest, motivate students, and ensure that students understand the content of the lessons better.

Keywords: video learning, media learning, biology, distance education

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Introduction

According to (Haleem et al., 2022); (Kamalov et al., 2023), rapid advances in information technology have changed the paradigm of society and the field of education. Teachers must compete with technological advances in today's education world. Students use smartphones more than ever before. students are no longer interested in learning in class. In addition, learning only two-dimensional media sometimes makes it difficult for students to understand the teacher's material, especially biology materials such as the respiratory system. In addition, another major problem is the limited time and space that do not allow students to participate in learning activities in class. E-learning, or learning that can be done via the internet, has grown rapidly in recent years. This is certainly good news for students who have limited time and distance to participate in learning activities far from their homes. Current learning uses a system called blended learning, which

combines face-to-face learning with online learning. E-learning has many features, one of which is video learning. Learning videos are 3-dimensional learning media that allow students to see and understand lesson concepts such as the complex respiratory system. It seems that current educational problems will be solved by a combination of e-learning and learning videos.

Biology, one of the fields taught in schools, is sometimes a bit difficult to convey. In biology lessons, illustrations are needed for several topics, such as body physiology, the circulatory system, the nervous system, and digestion. Therefore, it seems that the use of learning videos in the process of teaching Biology will help students understand the lesson better. According to (Souza & Debs, 2024); (Huang et al., 2023), the emergence of technology allows innovative methods to provide online education that change the way students understand, learn, and build their knowledge. Most studies have recognized that computer-supported collaborative learning is more effective than individual learning. Due to the internet, platforms, online learning, and courses that are spread all over the world, students can now learn from the comfort of their homes (Bubb & Jones, 2020). One of the advantages of watching videos are easy to understand. Video technology is considered more suitable for context-based learning than reading digital text because it can convey information or knowledge more engagingly and can help students understand and remember the subject matter. The ability of video to engage the visual and auditory systems is very important (Lange & Costley, 2020). Biology is a highly visual field, with many complex dynamic processes and non-sensory concepts. Therefore, visualization is a useful tool for learning dynamic processes and non-sensory concepts in biology.

According to (Ploetzner et al., 2021), still, images and animation are the most commonly used visualization tools. In terms of showing change, animation is considered better than still images. The animation shows the change in the process through changing images. As a result, animation is considered the most effective method for conveying information about change or movement (M. & Tyagi, 2018). Mei-Hui's research showed that students get better learning outcomes when combining direct instruction with classroom video blogs. (Geertshuis et al., 2021); (Tani et al., 2022), supports this study by stating that watching instructional videos during work has a positive effect on learning. The results of a study conducted by Irawan in 2018 showed that biology learning videos about making tempeh and yogurt were acceptable and effective for use in education.

Methodology

This study uses a literature research method, which collects information and data from previous articles or studies that are considered valid. The results of this study were obtained from references such as national and international journals related to the article's title. In addition, the reference materials used come from books that have been translated well.

Results and Discussion

Learning and Development of Videos

Video learning is a medium that presents audio-visual messages, language, steps, and application theories to help understand learning theories (Tarchi et al., 2021). Videos in the classroom are one of the tools that are often considered an important resource in dealing with the acquisition of pedagogical knowledge. Practical videos have become a very popular tool for teaching teachers (Gaudin & Chaliès, 2015). Over the past two decades, video-based learning has become a major concern for educational researchers. According to (Zhang & Taranikanti, 2024), video-based learning is very important for young children because they have difficulty understanding the symbolic meaning of two-dimensional images. With videos, you can see the teaching of a particular topic and a specific learning method in a very short time. The main benefit of using videos in the classroom is that they can help students work by overcoming delays caused by missing regular classes. It can help

regular students by providing an opportunity to recover from missed classes, help students who are having difficulty with oral language classes, and give students the spirit to review important aspects and check their notes.

Video-based learning is increasingly popular in today's education world because it is easier to create and store online. If we accept that starting to use videos to facilitate teacher learning with the right learning approach, educational leaders will start using it (STEM 2019). Videos can improve students' learning abilities, enhance their cognitive processes, and help them understand and remember information. In addition, Sara Routarinne stated that video methods have proven useful for teaching teachers in three ways: focusing on students' thinking and bridging theory and practice, improving analytical skills, and adapting pedagogical advice to actual classroom practice. The results of the study, according to Vincent Hoogerheide, showed that explaining to others through video was more effective than reviewing. New technologies such as video classes provide new ways for teachers to collaborate with their students and encourage the development of strategies that are more in line with new technologies.

Video learning is effective for learning activities and outcomes Technology is a tool that helps students and teachers achieve certain academic goals. Advances in information and communication technology have led to the emergence of new literacy practices. One practice is a digital video project created by students. Students involved in this project are asked to create videos in which they practice the language they are learning. Participating in these projects has many benefits for students. Experimentation with various digital video technologies to create meaningful personal multimodal artifacts is demonstrated by Hafner and Miller. They also pointed out that video projects provide a social context in which students can interact with each other. In addition, students' ability to use digital video technology to capture and play their own and others' performances will help them reflect on their language learning. Students have the opportunity to practice the target language in a more significant way and develop useful strategies for using the language. See video as an effective learning tool because it involves students in a cooperative project, which is a great opportunity to integrate all students in the class.

According to research conducted by (Hung & Chou, 2015), the presence of instructional or learning videos by teachers has a positive impact on students' perceptions of learning and satisfaction. This is in line with research conducted by (Boateng et al., 2016) who found that searching for and making educational videos improves the quality of content and learning outcomes. In addition, the mobile group had higher performance and satisfaction with the texts, while the videos had a greater influence on individual learning. (Mercier & Lubart, 2023)said that watching video games can help you understand better how to learn. It can also offer a new way to teach spatial skills. One of the biggest instructional benefits of video conferencing, according to (Rapanta et al., 2020), is the improvement of students' communication and presentation skills. Students can interact with real people outside their country through video conferencing, which allows them to move away from just reading textbooks and other printed materials. With video conferencing, students can learn from interesting speakers and go on educational trips without even leaving the classroom. Students learn about the culture and events of other countries more than reading an old textbook, looking at photos, or hearing from a teacher about the country. By using video, conference teachers can bring the outside world into the classroom in a truly real way. According to (Strømme & Mork, 2021) animation can improve understanding and encourage learning about DNA replication. In addition, (Mnguni & Moyo, 2021), found that students who took lessons with animation were more resilient to learning molecular biology compared to students who took lessons without animation. People, especially students, have benefited greatly from educational videos.

Educational videos are usually combined with online applications that can be accessed via the internet. These applications allow sharing and learning through smartphones, overcoming the limitations of space and time. This is definitely good news for millennial students who always use smartphones. Distance learning is increasingly popular today and is in great demand by students. Learning and studying online is no longer impossible. There are even online learning applications

and sites such as HarukaEdu that provide certificates and diplomas to those who have completed their learning process. Students do not need to leave the comfort of their homes to study through distance learning. In addition, interactive learning videos make learning more effective. Smartphones allow students to access learning activities through videos anytime and anywhere as long as they have an internet connection. Thus, these smartphones can help students who want to take part in learning activities remotely. In addition, several research findings show that video-based learning activities or learning videos show positive results in increasing students' interest, motivation, and cognitive abilities.

Even learning videos can be used to improve students' understanding of learning materials and build their confidence when they show their assignments to their peers. The results of Paivio's research (Kanellopoulou et al., 2019) the theory of bidirectional coding indicate that two interdependent coding mechanisms, verbal and visual, are involved in long-term memory. One code is not comparable to two. Visual displays, such as images or animations, will help convey information verbally. When information is received verbally and visually, the possibility of retrieving it increases because other memory sources will still be available if one is lost. That animation helps maintain long-term memory better than still images in the subject of cell biology. In addition, that animation makes it easier to display certain processes in cell biology material than still images. Learning videos are beneficial for educators and students. By using learning videos, teachers do not need to explain many concepts, especially difficult ones such as the digestive system, circulatory system, and nervous system, which are easier for students to understand with two-dimensional media. In addition, teachers can be more innovative in developing technological skills and can assess more than what they provide.

Conclusion

Based on the research results, it can be concluded that the use of video-based learning as a distance learning method has the potential to improve students' cognitive abilities, improve learning performance, foster students' interest and motivation, and improve students' understanding of the subject matter.

Conflicts of Interest

The writers say they have no competing interests.

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