THE EFFECTIVENESS OF USING MEDIA INTERACTIVE VIDEO LEARNING OF THE DIGESTIVE SYSTEM BASED ON PROJECT TO SUPPORT QUALITY SDGs EDUCATION

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Abstract

This study aims to determine the effectiveness of interactive video learning media about the digestive system based on projects to support quality SDGs education. Quantitative approach with experimental research design. Using a research design, namely one-group pre-test-post-test design. The sample used 34 students randomly and representative of the population of class XI students of SMA Swasta Taman Siswa Binjai. The data was tested with the N-Gain test to obtain effectiveness results using SPSS 25. The results obtained were effectiveness with a high category with a score of 0.8090.

Keywords: Effectiveness; Learning media; Project based learning; SDGs education

Abstrak

Kajian ini bertujuan untuk mengetahui keberkesanan media pembelajaran video interaktif tentang sistem pencernaan berdasarkan projek untuk menyokong pendidikan SDG yang berkualiti. Pendekatan kuantitatif dengan reka bentuk penyelidikan eksperimen. Menggunakan reka bentuk kajian iaitu reka bentuk ujian pra ujian pasca satu kumpulan. Sampel menggunakan 34 orang pelajar secara rawak dan mewakili populasi pelajar kelas XI Sekolah Menengah Swasta Taman Siswa Binjai. Data telah diuji menggunakan ujian N-Gain untuk mendapatkan keputusan keberkesanan menggunakan SPSS 25. Keputusan yang diperolehi adalah keberkesanan dalam kategori tinggi dengan skor 0.8090.

Kata kunci: Keberkesanan; Media Pengajaran; Pembelajaran berasaskan projek; SDGs pendidikan

1.0 INTRODUCTION

In the current era of globalization, more and more information and knowledge are spread in all fields, including education. As a result, it is necessary to develop learning media that utilize current advances in technology and science to make student access to information easier and more interesting.

Learning media plays a role as an important component in the learning process and greatly influences the smoothness of the learning process, which of course can affect student learning outcomes. Interesting and innovative learning media will encourage students to think creatively and better understand what is being taught.

Developments in the world of education today are challenges that continue to change and develop along with time and technology. This development must be managed by educators who meet the right standards so that it can be used in the development of science and technology-based education (IPTEK).

Media can also be interpreted as a medium that can attract students' attention so as to arouse students' learning motivation (Rahmawati, 2019). In the digital era, education must adapt to technological advances to create learning methods that are more creative, interactive, and relevant to the needs of today's students. The existence of technology is currently considered very important in human life as a support in carrying out various activities both in doing work and in terms of education (Lailan, 2024).

Technology can be a bridge to change the learning process to be more dynamic, by utilizing digital media such as videos, interactive simulations, and online learning platforms that provide space for students to learn independently and collaboratively (Waruwu et al., 2024). Thus, technology-based education not only improves learning outcomes, but also prepares students to face the challenges of an increasingly complex and technology-based world of work.

Teachers have not applied the concept of scientific literacy in their learning, and they have not chosen the right learning media to build and hone students' scientific literacy. The media used by students are only teacher books and student books provided by the government, as well as simple materials made by the students themselves. As a result, the learning methods used by teachers are still conventional and do not utilize technology. However, limited time and technological skills prevent teachers from implementing supporting media in the learning process.

They must create and develop innovative, creative, and interesting learning media that can be accessed anytime and anywhere. This makes students less active during the learning process so that teachers are required to create creative, innovative, and interesting learning media for students and can be used for independent learning anytime and anywhere. However, the obstacles faced by teachers in implementing supporting media in

the learning process are limited time and technological skills in creating and developing creative, innovative, and interesting learning media to hone students' scientific literacy skills.

Learning media that only refers to thematic books, the author realizes that students' understanding of the material on the Human Digestive System discussed in printed books does not provide students with sufficient understanding, the human digestive system is a material that is not only sufficient if explained verbally and in writing in printed books.

The need to change elements in the learning structure is the application of learning media that uses animated videos in order to provide solutions to overcome the limitations of students' experiences. Previous research has shown that technology such as learning videos has great potential to increase student motivation and help them understand the material better (Agustini et al., 2024).

The existence of quality education is expected not only as a means of 'agent of change' for the younger generation, but also as an 'agent of producer' in order to create real transformation for the progress of a nation (Safitri et al., 2022). Learning material products can be produced from project-based learning. Project-Based Learning (PjBL) is a project-based learning model (Erungan et al., 2023). Through the PjBL learning model, a project will be designed from which a product will be produced. So that students have space to express creative and innovative ideas by trying new things through the project work they do. For this reason, students are required to be more active and educators act as facilitators (Juwanti et al., 2020).

Education is stated in the Sustainable Development Goals (SDGs), namely ensuring the quality of inclusive and equitable education and increasing learning opportunities for all levels of society (Amin et al., 2020). SDGs is a continuation program of MDGs or Millennium Development Goals to achieve the sustainable development goals of SDGs 2030. The implementation of education based on SDGs is a new challenge to build a quality and globally competitive education system (Ardhiya et al, 2022).

This study aims to determine the effectiveness of using interactive video learning media about the digestive system based on projects to support SDGs of quality education. This study offers an innovative solution by designing low-tech learning media that remains effective, contributing to the inclusiveness of education in the digital era.

2.0 MATERIALS AND METHODS

Sample and Participants

The sample used 34 students randomly, the sampling aims to ensure the diversity of samples and the representativeness of the population of class XI students of SMA Swasta Taman Siswa Binjai. Its implementation in various learning activities, including pre-test and

post-test.

Data Analysis

This study uses a quantitative approach with an experimental research design. Using a research design, namely one-group pre-test-post-test design.

Design of One Group Pre-test – Post-test

$$O1 \rightarrow X \rightarrow O2$$

Information:

O1: Pre-test score (before treatment)

X: Treatment

O2: Post-test score (after treatment)

The data collection technique used in this study was a learning outcome test. The learning outcome test is used to measure the level of student learning outcomes in the cognitive domain through initial and final tests. The data obtained were tabulated into a diagram. Furthermore, the data results were tested with the NGain test to obtain effectiveness results using SPSS 25.

The N-Gain value categories used as benchmarks are as follows:

g > 0.7 = high

0.3 ≤ g ≤ 0.7 = moderate

g < 0.3 = low, (Meltzer, 2002).

3.0 Results and Discussion

Interactive Video

This interactive video is a learning medium designed to help students understand the concept of the human digestive system as a whole through a project-based learning approach. Presented in an interesting way with a combination of educational animation, interactive simulations, and reflective quizzes, this video also challenges students to develop creative projects as a form of applying their knowledge, as seen in Figure 1.

Figure 1: Result of pretest and postest data

This video not only delivers the material visually, but also actively engages students

through interactive features. Students are invited to complete a project in the form of an educational campaign about the importance of maintaining a healthy digestive system, as seen in Figure 2.

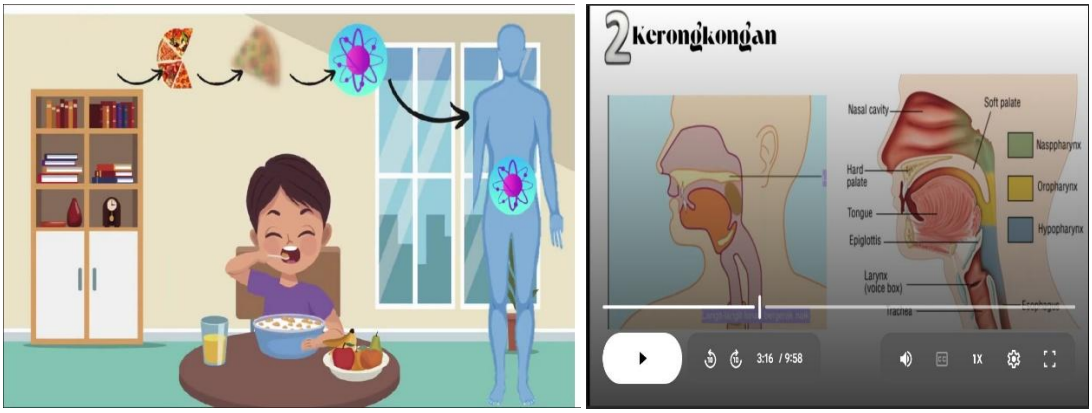

Figure 2: Result of pretest and postest data

Through this media, students are trained to understand the structure and function of human digestive organs, analyze factors that affect digestive health, develop critical thinking skills, creativity, collaboration, and communication, and realize the values of the Sustainable Development Goals (SDGs), especially in the fields of quality education and good health, as can be seen in Figure 3.

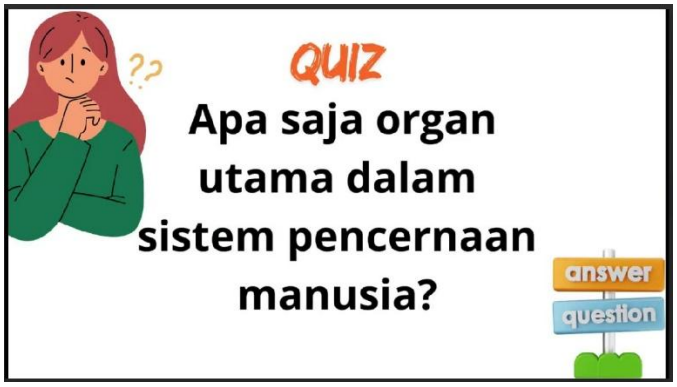

Figure 3: Result of pretest and postest data

Results of Data

The results of learning are taken from the pre-test and post-test scores given to students. The pre-test and post-test scores can be seen in Figure 4.

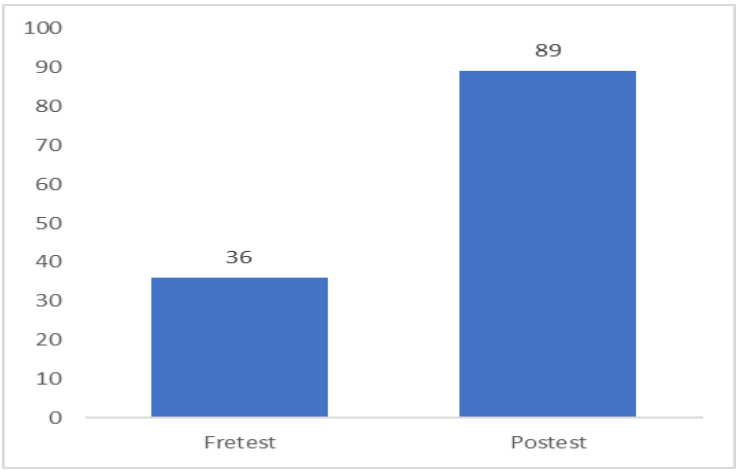

Figure 4: Result of pretest and postest data

Frequency of Data

The data obtained was also subjected to a frequency test which can be seen in Table 1.

Table 1: *Results of Frequency Data*

Statistics

		Postest	Pretest
N	Valid	34	34
	Missing	0	0
Mean		88.53	36.18
Median		90.00	30.00
Mode		90	30
Std. Deviation		10.483	13.929
Minimum		60	10
Maximum		100	60

N-Gain Test

Once it is known that there is an increase in learning outcomes, it is necessary to calculate the N-Gain score to measure the improvement criteria, which can be seen in Table 2..

Table 2: *Results of N-Gain Test*

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NGain	34	.40	1.00	.8090	.16654
Valid N (listwise)	34				

Based on the table, the N-Gain score of learning outcomes obtained a score of 0.8090, meaning that the interactive learning videos developed and used can improve the learning outcomes of students who are included in the high effectiveness category.

Discussion

As a learning medium, teachers use video media that has been designed as well as possible based on the material and learning objectives, so here teachers do not just choose

videos as learning media. After doing this, the teacher shows the video that has been made that is related to the material. The results obtained by teachers in using video media increase understanding of the material presented.

Because understanding is a basic ability for students, every student must have the ability to understand. This is a foundation for students to develop themselves so that they have the ability to apply, analyze, evaluate and ultimately the ability to create. Several studies have shown that understanding students' concepts can be a problem in learning. One study based on this problem has successfully shown that videos can improve student learning outcomes.

According to the results of this study, student learning outcomes increased by implementing interactive videos of the digestive system based on projects and had high effectiveness according to research by Pasaribu et al (2025), that students gain a good understanding of biology material through the application of digital learning media based on PjBL. The results of research by Mukra et al (2024), explain that learning with animation based on project based learning can foster concentration so as to improve student learning outcomes. Likewise with Matondang et al (2024), that with project-based learning students are able to collaborate and are able to access various information, and can evaluate the results of the project so that the role of the teacher as a facilitator to ensure that teaching and learning activities run according to learning objectives.

Learning outcomes are a measure of the effectiveness of the learning process. Three general perspectives are used to assess learning outcomes such as cognitive, emotional, and psychomotor. Students who show changes are considered to have successfully achieved learning objectives, knowledge, perspectives, and skills better than before. As in previous studies. The findings show that the use of learning media has a positive impact on student learning progress, including improving learning outcomes.

Therefore, it is important to continue to encourage the implementation of more efficient learning media to teachers in implementing it. Thus, it is hoped that there will be a significant increase in the quality of learning and student achievement in the future (Wardani et al., 2024).

4.0 CONCLUSION

Analysis of the results of the research that has been carried out shows an increase in learning outcomes and the applied project-based digestive system learning video media obtained a high effectiveness category with a score of 0.8090. The Merdeka Curriculum carries the concept of rich intracurricular learning, where content diversity is the main focus. This aims to ensure that students have enough time to understand and explore concepts.

Thus, direct interaction between teachers and students is considered ineffective in

achieving maximum learning. Therefore, the author designed and developed a project-based interactive video about the digestive system. Learning videos make it easier for students to learn and also make students more interested in learning and learning objectives are achieved.

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