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The Effectiveness of Electronic Teaching Materials in Vocational High Schools on Students' Independent Learning Responses

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Abstract

The rapid improvement of information technology has changed the educational landscape, including in vocational high schools (SMK). Electronic teaching materials offer great potential to improve the quality of learning and encourage students to learn independently. Education is a vehicle for the acquisition of information and skills that are then transferred as abilities for the job or to make a productive life.This study aims to examine the effectiveness of use in improving the independent learning response of vocational school students. This study uses a quantitative research design with an experimental method. The research sample consisted of vocational school students in three vocational schools. Data collection was carried out through learning achievement tests and independent learning response questionnaires. The results of the study showed that students who used electronic teaching materials had a significant increase in learning achievement compared to each other. In addition, students also showed higher self-learning responses, such as greater motivation to learn, better study time-management skills, and a tendency to seek out additional learning resources. These findings show that electronic teaching materials have great potential to improve the quality of learning and encourage vocational school students to learn independently. This research was carried out at SMK Negeri 4 Serang City on students of the automotive expertise program. The use of electronic teaching materials can facilitate learning that is more active, interesting, and relevant to the needs of students in the digital era. However, further research is needed to identify the factors that affect the effectiveness of electronic teaching materials and to develop a more effective learning model by integrating electronic teaching materials.

Keywords: Electronic teaching materials, Independent learning, Vocational high schools

INTRODUCTION

Education is the basis for determining how advanced a country is. Education means exploring students' potential and then developing them according to their abilities. Education can help students acquire spiritual, emotional, knowledge, and skills (Nugrahaeni & Wulandari, 2022). Education is now very important. Therefore, learning, especially formal education, requires professional teachers, the completeness of school facilities including teaching materials (Telaumbanua, 2022). Teachers now need to be creative and imaginative instructors due to the advancement of science and technology in the classroom. The greatest amount of supporting media is required for an effective learning process because learning media will enable teachers to more easily impart sound knowledge and comprehension to pupils (Aini, 2022). With this shift in the learning process, teachers must have the ability to provide learning resources that are appropriate to technology. One way to provide instructions is to present an e-module (Maya Istyadji, 2021). However, the subject matter currently used in schools is still print-based provided by the government. This printed material is considered uninteresting and makes students easily bored reading it (Wendo *et al*., 2022). The use of electronic teaching materials needs to consider internet access to find materials, print and download the required teaching materials (Blummer & Kenton, 2020). In practicum learning, teaching materials still come from books published by various publishers that are available for purchase. The material used is textual, concise, and equipped with practice questions, but it does not meet the requirements because the material does not cover all basic competencies thoroughly (Pratiwi & Listiadi, 2021)

Intelligent systems are built on learning to adapt to changing circumstances. Evolution has given humans and other highly adaptable organisms the capacity to continuously acquire, update, collect, and utilize information in response to environmental changes (Wang *et al*., 2023). Education is a vehicle for the acquisition of information and skills that are then transferred as abilities for the job or to make a productive life (Okunlola, 2023). Independent learning is a process or approach to learning that suggests that students take responsibility for, control, guide, and manage their own learning. Setting objectives, making decisions, attending to their learning requirements, designing and carrying out their own education, keeping track of their progress, and self-evaluating the learning results are all skills that autonomous learners possess (Sveshnikova *et al*., 2022). Independent learning places a strong emphasis on acquiring the competencies and skills necessary to guarantee that students are prepared to learn without the assistance of others. This calls for the development of related abilities like critical thinking, problem solving, and self-control (Noble Po-kan Lo, 2023). However, in its implementation related to independent learning, there are many aspects that must be prepared by students and teachers, one of which is the aspect of learning media and facilities in terms of the internet network. For students who study and live in areas that have limited facilities are still difficult to learn independently, the role of teachers and media that is easy to use and understand is needed. In the current process of independent learning, teachers find several problems. For example, they found that learners were unmotivated and not interested in participating in learning activities. They also feel bored with existing learning approaches and models (Maulana *et al*., 2023)

Based on the description above, the researcher is interested in conducting research related to the effectiveness of the use of electronic teaching materials on students' independent learning in vocational high schools. So that with the existence of electronic teaching materials in vocational high schools, students are more motivated to be able to carry out learning independently. In accordance with the research that has been carried out by (Lino *et al*., 2024) that all learning activities are preceded by motivation, both from within and from outside. Even the process and success of a person's independent learning are greatly influenced by the motivation of independent learning, because the strengths and weaknesses of the motivation of independent learning determine how intense or active a person's independent learning. This research was carried out at SMK Negeri 4 Serang City on students of the automotive expertise program.

METHOD

This study used a type of quasi-experimental research with a nonequivalent design group control design. This research was carried out in a vocational high school majoring in automotive with a total of 50 students at SMK Negeri 4 Serang City. The dissemination of research instruments using google forms provided through the class whatsapp group. The data analysis technique is carried out using descriptive analysis, namely the data that has been obtained by researchers, that have been determined will be described through the presentation of data using a table.

RESULTS AND DISCUSSION

According to research conducted on 50 vocational high school students at SMKN 4 Serang City, the automotive light vehicle engineering expertise program, the percentage of

material aspect values is 89%, the percentage of media aspect values is 89%, and the percentage of media aspect values is 89%. These results show that students' response to electronic teaching materials with a percentage of 89% is very effective in using it in the independent learning of vocational high school students. Seen in the Table 1.

Table 1. Score of assessement aspect

No	Assessment Aspects	Number of Grains	No. Item	Criterion Score	Total Value	Average	Percentage	Category
1	Material aspects	3	1	218	671	223,67	89%	Highly effective
			2	221				
			3	232				
2	Learning aspects	2	4	227	447	223,50	89%	Highly effective
			5	220				
3	Media aspects	5	6	212	1111	222,20	89%	Highly effective
			7	226				
			8	234				
			9	213				
			10	226				
Total score				2229	2229	669,37	268%	Highly effective
Average				222,90	222,90	223,12	89%	

The research data in table 2 shows that students in the experimental class (using electronic teaching materials) have a higher average score than the control class. This shows that electronic teaching materials are effective in improving student learning outcomes. And students in experimental classes tend to allocate more time to independent learning. This indicates that electronic teaching materials are able to motivate students to learn independently. Seen in the Table 2.

Table 2. Hypothesis test results

Variable	Control Classes (n=25)	Experimental Classes (n=25)	Statistical Test	Value p	Conclusion
Final Test Score (average)	75	82	t-test	0,02	Significant
Study Time (average, hours)	3	4	t-test	0,01	Significant
Participation in Online Discussions (average, times)	2	3	t-test	0,03	Significant
Perception of Teaching Materials (Likert scale)	3.5	4.2	Uji Mann-Whitney	0,01	Significant
Perception of Learning Methods (Likert scale)	3.2	4	Uji Mann-Whitney	0.02	Significant

In the aspect of electronic teaching materials, they contain material that is already understood by students, such as the display of images and videos that attract students' interest in independent learning because these electronic teaching materials are easy to use so that they can improve student competence. Meanwhile, from the media aspect, electronic teaching

materials can be used anytime and anywhere so that students can learn even without supervision from the teacher, students only need gadgets such as cellphones or laptops and can be accessed online or offline to make it easier for students to get learning materials. So this is very effective in the learning process in the ongoing 4.0 technology era around the world.

The use of electronic teaching materials is used in vocational high school learning because it allows teachers to deliver the material in an engaging way and students can access it anytime and anywhere. This allows students to be more effective at learning independently. Teaching materials combined with information technology can improve the learning process. To achieve this, technology is needed to help students and teachers learn (Quezada *et al*., 2021). So that the need for digital teaching materials in the 21st century is needed to improve students' ability to meet graduate competencies (Putri & Asrizal, 2023). From this statement, it is hoped that the need for the use of electronic teaching materials can be realized by teachers as well as schools and the government to improve the quality of Vocational High School graduates. The use of electronic textbooks as a tool for independent learning is an educational process that must create a pleasant atmosphere. This happiness applies to teachers, students, parents, and everyone (Maulana *et al*., 2023)

CONCLUSION

Based on the results of the study, it can be concluded that electronic teaching materials have a very significant influence on the improvement of independent learning responses of vocational high school students. As shown by the percentage of 89% of students who consider electronic teaching materials to be very effective in all aspects studied, these teaching materials not only present the material well, but can also make learning more interesting and active. These results are in line with previous research that shows that electronic teaching materials can increase students' motivation to learn and improve their ability to learn on their own. The results show that the use of electronic teaching materials not only helps students understand the material, but also helps them become more independent when learning. This makes it a very useful approach to vocational education.

SUGGESTIONS

This research was limited to one vocational high school. Further research can be done by involving more schools and students. This study can learn more about the factors that affect how well electronic teaching materials work and how the use of electronic teaching materials has a long-term impact on students' academic achievement.

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