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Analysis of Video as Virtual Learning Media in Physics for High School Student

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Abstract
The use of technology in using the learning media becomes a matter for teachers because it plays an important role in achieving learning goals. Technology is applied in education as learning media videos in learning process in classroom. The research aims were (1) analysis the use, (2) finding the positive impacts, and (3) finding the inhibitor factors in learning videos as virtual learning media on physics subjects for high school students in Pacitan Regency. The study used a qualitative-descriptive method using the data-collection technique: centralized interviews. The results of the study revealed that (1) the way high school teachers teach media in Pacitan Regency was mostly the same, id est explaining the key points of the material that would be presented through the video, dividing students into small groups and allowing them to discuss and communicate with each other, as well as sharing ideas and thoughts with their group mates, and then concluded with a confirmation and a clarification of the students' conceptual understanding. (2) There were several positive impacts from the use of a learning video media that is helpful teachers and students in the teaching process, that is students became more interested in the lesson material presented, and students became more active due to the learning process using group discussion methods, which led to increase enthusiasm. (3) There were also several inhibitors from the use of learning video media, i.e. some teachers not being tech-capable, which likely caused difficulties in operating the tools and facilities and infrastructure provided by the school were still incomplete or might not have been available at all.

Keywords: learning video, learning process, virtual learning media, qualitative-descriptive method

INTRODUCTION

Everyone can easily access information media and have alternative choices to satisfy their needs in the current global era (Chotimah, 2017). The ease of accessing media is due to the increasing number of gadgets offering more comprehensive features, such as information storage, task list creation and work planning, calculations, sending and/or receiving messages, and so on (Rasma, 2018). From social media for communication to virtual learning media such as educational videos, there are many kinds of useful internet-based information and communication media, i.e. media used by teachers (educators) to carry out learning to facilitate communication and interaction with students both inside and outside the classroom (Ansori, 2019; Iswahyuni et al., 2017).

The teaching and learning process is essentially communication and interaction process between an individual and their environment, which involves the transmission of messages from the message source (teacher) through certain channels or media to the message receiver or student (Ansori, 2019). The conveyed material is the content of the lesson in accordance to the applied curriculum. The posibility sources of the message are teacher, student, other people, or the author of the book and media producers. The message channel is the educational media/learning media, and the message receiver is the student or teacher. The teaching and learning process is a system that has various components, both subjects and objects, that work together to achieve a learning goal (Lubis, 2021). These components include learning objectives, teachers and students, learning materials, teaching methods and strategies, as well as facilities and infrastructure (learning media) (Sardiman, 2021).

One of the key components in achieving learning objectives is the learning media, which consist of facilities and tools that aid in clarifying the communication or educational message between teachers and students (Rohim et al., 2021). Learning outcomes can be achieved well if in the teaching and learning process, educators (teachers) have teaching skills and successfully use learning media (Anggraini, 2020). The presence of learning media in the teaching and learning process is expected to assist teachers in delivering material so that learning objectives can be achieved, and students can be motivated and be more active in learning activities (Daryanto, 2010).

One of the difficulties in mastering physics is the challenge in learning the calculation indicator due to many symbols and formulas, which require an understanding about basic mathematical concepts (Marantika, 2009). Learning difficulties are influenced by several factors, including internal and external factors (Ahmadi & Supriyono, 2004). Internal factors causing difficulties at student learning are aspects of talent, interest, motivation, and intelligence. These are also caused by a lack of innovation in the learning process provided by teacher (Fianti et al., 2018). Basically, the subject of physics is derived from activities through scientific activities and investigation, that requires creative thinking from learners (Ekawati & Lin, 2014; Nurohman, 2006). On the other hand, external factors are facilities and infrastructure as well as the activities of the students themselves (Haqiqi, 2018) In Indonesia, teachers are required to have four basic competencies, i.e. pedagogical, personality, social, and professional competence (Ananda, 2018). Among the four competencies, the highest need is professional competence. This means that teachers must be able to meet competency standards and master the material to be taught to students. They must also capable in mastering and understanding how to use the media in learning process.

Teachers need to keep mastering about educational technology, especially about learning media, as it plays an important role in achieving learning objectives. It is because teachers need to utilize various forms of learning media to create a conducive classroom atmosphere and to ensure the learning objectives are achieved successfully (Isjoni, 2014; Saputri et al., 2020). The implementation of technology in educational media presented a viable option for teachers—for example, through the adoption of learning videos (Ilesanmi, 2023; Salsabila & Agustian, 2021). On the other hand, students claim that virtual learning media can be used effectively as a learning medium (Maulana et al., 2023). Students prefer video to soft copy and audio recording materials as virtual learning media because they can replay the materials of learning whenever they want on their gadgets (Harahap & Rusli, 2021). And when online-face to face learning is conducted, student opinion reveled that Zoom Cloud Meeting is more effective media (Rahman & Daulay, 2021). Contrary, teachers perception about using virtual learning media showed that the learning process is not effective (Ghofur, 2021).

The use of technology and virtual media in the educational process can be done by using instructional videos as audiovisual media in virtual learning (Kurnia, 2021). Based on previous studies, the use of instructional videos essentially represents the utilization of educational technology in accordance to the times, aimed at improving the quality of education (Batubara & Batubara, 2020). Further, the use of video-based learning media greatly helps in enhancing the creative thinking patterns of students (Fianti et al., 2018). In addition, these instructional videos can be used to help explain material and can be utilized without having to meet face-to-face in one place, meaning they can be conducted virtually (Mu'minah, 2021). Video-based learning environments have great potential to influence the future of education and provide facilities that support students' learning activities (Giannakos et al., 2016). However, the common problem is that not all students and teachers live in areas with stable internet access, which often makes it difficult for them to find a good connection in learning process (Mu'minah, 2021). As an example, from previous studies, it was known that video-based learning media was very suitable for use in the learning process because it was highly favoured and could influence student learning activities. Other research results reveal that the use of videos in physics learning effectively improves student learning outcomes and encourages active student participation in learning. While it had advantages and disadvantages in its use, it had been widely developed for physics materials, all of which had been validated for use as learning.

The study was conducted in Pacitan Regency based on observations and interviews with 8 high school physics teachers in Pacitan Regency on Tuesday, September 20, 2023. The observation results stated that the teaching methods of most teachers tended to be the same (monotonous) and used learning media such as textbooks and blackboards. Teachers rarely used virtual learning media such as instructional videos, which caused students (learners) to often feel bored with the teaching methods. Teachers seldom used instructional videos as virtual learning media due to students' limited data quotas and internet network issues in various areas where students and teachers lived. The use of

learning media and teaching methods that lacked variety made it difficult for students to grasp the material explained by the teachers, making physics lessons seem difficult and boring to students.

Based on the above description and explanation, this research was conducted to analize the way of utilizing, find the positive impacts, and find the inhibitor factors of instructional videos as virtual learning media in physics for high school students in Pacitan Regency so that students become more interested and not easily bored with physics learning.

METHOD

This research uses a descriptive-qualitative method. Descriptive research method is a research method that attempts to describe or illustrate a phenomenon, event, or incident that is occurring now or has occurred in the past (Hardyanti et al., 2018). Meanwhile, the approach used in this research was the qualitative approach. Qualitative research is descriptive research, which is an in-depth analysis of phenomena in a problem, that produces descriptive data in the form of written or spoken words from people or observable behaviour (Lahiri, 2023; Moleong, 2006). Qualitative research often runs without numerical calculations and uses data based on arguments. Arguments in qualitative data can be presented in the form of words or sentences, not numbers, so they cannot be calculated. In this research, the arguments used were those from 5 high school physics teachers in Pacitan Regency and some students at SMA Negeri 1 Ngadirojo. The 5 high schools in Pacitan Regency, i.e. SMA Negeri 1 Ngadirojo, SMA Negeri 2 Ngadirojo, SMA Negeri 1 Pacitan, SMA Negeri 2 Pacitan, and SMA Negeri Tulakan. Data was obtained directly from the sources to be observed and recorded for the first time and serves as the main material. Data collection was done through interactions with other people or through documents (Sugiyono, 2019). Data was obtained through focused interviews aimed at gathering information via face-to-face question-and-answer sessions using guidelines and a list of questions with high school physics teachers in Pacitan Regency. This was supported by distributing questionnaires to 60 students at SMA Negeri 1 Ngadirojo, followed the previous research of Sujarweni (2015).

Data triangulation was conducted to obtain data with a high level of validity. Data triangulation is a data collection technique that involves combining various existing data and sources (Sugiyono, 2019) and a technique for checking the validity of data that utilized something outside the data to verify or compare to the data. Moreover, triangulation can enrich research as it offers a variety of datasets to explain differing aspects of a phenomenon of interest (Noble & Heale, 2019). It could be an approach used by researchers to explore and to process qualitative data. Additionally, theoretical triangulation is used with the final research results being a formulation of information or a thesis statement. This information was then compared to relevant theories to avoid individual bias/misunderstanding by the researcher of the conclusions drawn. Moreover, theoretical triangulation could increase the depth of understanding if the researcher could deeply explore theoretical knowledge from the results of the data analysis obtained. The step taken included comparing observational data to literature review and exploring the truth through written documents, archives, and official documents.

RESULT AND DISCUSSION

Primary data collection was done through interviews and questionnaire distribution. The secondary data collection was conducted based on articles, journals, books, and documents containing texts related to the research problem. The research findings from the interviews and questionnaire distribution were divided into three points: the ways of utilizing instructional video media, the positive impacts of utilizing instructional video media, and the inhibiting factors in utilizing instructional video media.

Ways of Utilizing of the Instructional Video Media

The focus of this stage was to analyse the instructional media used by physics teachers in the classroom, which was instructional video media. Based on the interview results, all the teachers who were the resource persons had tried using or utilizing the instructional video media prepared by the researchers. These videos were quite aligned with the curriculum applied in the schools where the research was conducted. The ways of utilizing these video media in the classroom certainly vary among teachers, as well as the teaching strategies and other strategies used to support the learning process using this instructional video. However, from the interview results, almost all teachers used similar

methods of utilizing instructional video media.

Based on the analysis and summary of the interview results with 8 high school physics teachers in Pacitan Regency, the data showed that the primary way in using instructional video as virtual learning media in the classroom was by playing the instructional videos, then pausing them to explain directly or using the blackboard to explain materials that might be difficult for students to grasp or accept directly. They then resume playing the instructional videos and provide time for students to ask questions about anything they do not understand.

Another method used by teachers was to start the lesson by explaining and reviewing materials from previous meetings, then presenting what will be learned in that session. Once all the points were adequately explained, they proceed to show the video while explaining it to ensure the video's explanation was more detailed and understandable for the students.

Positive impacts of Using Instructional Video Media in the Classroom

Questionnaire had been validated by experts and then distributed to students. There were 10 statements in the questionnaire to explore about the advantages of using instructional video media in the classroom. Item number 1 with the statement that *"In my opinion, appropriate instructional media is needed in physics learning to enhance learning enthusiasm."*, received the assessment of Strongly Agree and Agree from most students. Item number 2 with the statement that *"I am more enthusiastic about participating in learning activities using physics instructional video media."*, and the statement in item number 3, which is: *"In my opinion, learning activities using instructional video media can improve academic achievement."*, received high ratings from most students, with Strongly Agree and Agree responses. In item number 4, almost all students stated Strongly Agree with the statement that *"I feel happier when classroom learning uses instructional video media."* The statement in item number 5, *"I am more focused on the material explained through instructional video media."* received positive feedback from students, with Strongly Agree and Agree ratings. The statement in item number 6, *"I am more interested in doing assignments after receiving explanations of physics material using instructional video media."* also received good ratings from students, with most rating Strongly Agree and Agree. Items number 7 and 8, with the statements *"I am interested in participating in discussions during the learning process with the use of instructional video media."* and *"I am happier and more motivated to participate in discussions when learning activities use instructional video media."* received good ratings from students, with most rating Strongly Agree and Agree, but a small portion of students gave Disagree ratings. The statement in item number 9, *"I find it easier to understand the material displayed in the video and explained by the teacher."* and item number 10, *"I feel encouraged to solve problems when learning activities use physics instructional video media."* received Strongly Agree ratings from most students, with only a small portion giving Agree ratings. Student comments about the statements were showed systematically in Table 1.

Table 1. Assessment of the positive impacts of using instructional video media

Assessment	Statement Item Number									
	1	2	3	4	5	6	7	8	9	10
Strongly Agree	40	43	41	59	49	57	54	54	58	53
Agree	20	17	19	1	11	3	4	5	2	7
Disagree	0	0	0	0	0	0	2	1	0	0
Strongly Disagree	0	0	0	0	0	0	0	0	0	0

The results in Table 1 showed that most students agreed and even strongly agree with the statements in the questionnaire about the positive impacts of using instructional video media. This was due to several factors from the teachers, the school, the students, and the video itself, which all had helped and supported the process of using video as instructional media in the classroom. Some of the positive impacts of using instructional video media observed included students becoming more enthusiastic in the learning process, students also becoming more focused on the materials given by the teacher, and the video media also greatly assisted teachers in the teaching process. This was because the instructional video media was very easy to operate, contained quite comprehensive material, and did not disrupt the learning process in the classroom. These results were quite consistent with what had been proposed by Alonso, et al. (2018) which states that instructional video media was very helpful for teachers in reducing cognitive load when trying to liven up the classroom atmosphere

while explaining key topic concepts.

Inhibiting Factors in Utilizing Instructional Video Media in the Classroom

Instructional video media as a virtual learning tool had proven to be very helpful for both teachers and students in the teaching and learning process, especially in the focus of this research, which was the physics subject. However, behind all of those, there were certainly some factors that hindered the use or implementation of instructional video media as a virtual learning tool in the classroom. The questionare had been prepared and validated by experts to explore the inhibiting factors which were triggered of disanvatages in utilizing instructional video media in the classroom. The questionare consisted of 10 statements and delivered to students.

Items number 11 and 12 regarded inhibiting factors in utilizing instructional video media. There were: *"The use of instructional video media in the classroom is very beneficial for students, but there are also inhibiting factors experienced during the learning process."* and *"The inhibiting factors encountered include internal factors (from within the instructional video) and external factors (from the classroom environment)."* These statements received Strongly Agree ratings from most students, with only a small portion giving Agree ratings.

The statement in item number 13, *"Teachers have experienced difficulties in operating instructional video media, which hinders the learning process."* received Agree and Disagree ratings from most students and Strongly Agree ratings from a few students. Thus, the level of agreement on item number 13 is higher than the level of disagreement, indicating that this item is agreed upon by the students.

The statement in item number 14, *"The facilities and infrastructure provided by the school are still incomplete and become one of the factors hindering the use of instructional video media."* received agreement from students, with most giving Agree and Strongly Agree ratings.

For, the statement of item number 15 *"Glare from classroom lights and sunlight from outside also disrupts the learning process."* received Agree and Strongly Agree ratings from many students, although the disagreement ratings were higher.

Item number 16, with the statement *"The noisy environment outside the classroom disrupts the learning activities when using instructional video media."* received Agree and Strongly Agree ratings from most students, with a small portion giving Disagree ratings. Item number 17, with the statement *"The noisy classmates make it difficult for me to focus on the instructional video being displayed."* also received high agreement ratings from students.

The statement in item number 18, *"Teachers exceed the allotted time when using instructional video media, so when the bell rings for the next class, the teacher has not finished teaching."* and the statement in item number 19, *"Teachers have managed to overcome inhibiting factors in using instructional video media, both internal and external."* received high agreement ratings from students.

Finally, the statement in item number 20, *"I hope that learning activities using instructional video media are not only implemented in physics but also in other subjects."* received Strongly Agree ratings from almost all students, with only one student giving an Agree rating. The result analysis of questionare to explore the inhibiting factors can be seen in Table 2.

Table 2. Assessment of the inhibiting factors in utilizing instructional video media

Assessment	Statement Item Number									
	11	12	13	14	15	16	17	18	19	20
Strongly Agree	58	59	6	29	5	41	31	33	48	59
Agree	2	1	34	31	19	14	29	14	10	1
Disagree	0	0	20	0	23	5	0	8	2	0
Strongly Disagree	0	0	0	0	13	0	0	5	0	0

Based on the student questionnaire results, the inhibiting factors included a lack of illustrations provided in the instructional videos, as well as several other external factors from the classroom environment that hindered the use of instructional video media. These included a noisy environment outside the classroom, external lighting that could affect the video display in the classroom, and the monotone teaching methods. It was agreed with other research that the use of instructional media by teachers has been still monotonous or lacked variety and less ideal because the media could not provide good quality delivery of the material (Permadi & Muhajir, 2015). The monotonous teaching methods might come from the lack of knowledge in using learning media (Kadir et al., 2023). Furthermore, the inhibiting factors might come from the lack of facilities and infrastructure to support the use of instructional video media in the classroom (Naim, 2016).

CONCLUSION

Based on the analysis of the research data and discussion, it was concluded that several methods of utilizing instructional video media as virtual learning tools applied by teachers included explaining the key points of the material that would be presented through the video, dividing students into small groups and allowing them to discuss and communicate with each other, as well as sharing ideas and thoughts with their group mates.

The positive impacts of using the instructional video media where students became more interested in the lesson material presented, and students became more active due to the learning process using group discussion methods, which led to increase enthusiasm. On the other hand, the inhibiting factors were some teachers not being tech-capable, which likely caused difficulties in operating the tools. Additionally, the facilities and infrastructure provided by the school were still incomplete or might not have been available at all.

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