The Effectiveness of Online Learning Media on Physics Subjects During a Pandemic

Thufail Mujaddid Al-Qoyyim*, Tomi Hasan Basri¹, Reny Paramitha¹, Nurliza Hanim¹, Wiwin Melia Utari¹, Siti Jamila¹, Susilawati¹

¹Department of Physics Education, FKIP, University of Mataram, Mataram, Lombok, West Nusa Tenggara, Indonesia.

Abstract: The purpose of this study was to find out how effective online learning media is in improving high school students' physics learning outcomes during a pandemic. There are regulations from the Ministry of Education and culture regarding the implementation of education during the Covid-19 pandemic which requires distance learning using online learning media. The use of online learning media by developing technology can be a new innovation to further increase the effectiveness of online learning, including in physics subjects. The method used is literature research and library research using learning literature in the form of scientific articles in journals and books that reveal the effectiveness of online learning media. The results of the research show that digital-based online learning media is quite effective in improving high school students' learning outcomes in physics subjects. With these results, it is hoped that educators (teachers and lecturers) or educational researchers can develop and innovate learning media that are more effective and efficient in improving student learning outcomes, especially in physics subjects.

Keywords: Effectiveness; Learning media; Online learning; Physics e-learning

Introduction

The Covid-19 pandemic has become a very global pandemic at this time (Ibrahim, 2020). There are two types of coronaviruses that are known to cause diseases that can cause severe symptoms that can attack the respiratory tract, such as Middle East Respiratory Syndrome (MERS) and severe acute respiratory syndrome (SARS) (Dewi, 2020). According to data from the United Nations Educational, Scientific and Cultural Organization (UNESCO), there are at least 290.5 million students worldwide whose learning activities are disrupted due to schools being closed (Purwanto, et al., 2020). The pandemic forces each of us to adapt in all aspects of life, including the world of education by maximizing the functions of technology and communication. The use of technology in learning is one solution to overcome these problems (Aminoto, Tugiyo & Pathoni, 2014). The learning process from home through online learning should ideally still be able to accommodate the learning needs of students to develop talents and interests according to their education level. Online learning is a learning system that is carried out using pedagogical tools or educational aids that allow you to use internet access and good information technology to be a facility in the formation of the learning process and knowledge through interactions (Pakpahan, 2020). Due to this pandemic period, the use of online learning is considered an alternative step to break the chain of transmission, but learning continues. In the success of online learning,

There are so many online learning media technologies that are used in every educational institution, at the school and university level to streamline the learning process carried out. For example, e-learning, namely the application of electronic communication, education and training activities that have the characteristics of (1) interactivity (2)
independence (3) accessibility (4) enrichment (Rusman, 2012). Other platforms can also be used as digital learning media, for example, such as google classroom, youtube, whatsapp group, facebook, edmodo, zoom, google meet and other platforms that can support learning from home facilities. In addition, there is also a Video Conference application that can be used to meet face-to-face online such as Zoom Meeting and Google Meet (Sadikin & Hamidah, 2020).

This very rapid development of technology must be in line with improving the quality of human resources so that the direction of the development of science and technology can lead to the right target. We as teachers pay close attention to improving the quality of human resources, especially in seeing problems and developments in the learning process, students and teaching materials being taught (Mulyadi, 2020). Even so (Arifa, 2020), the current condition of online learning cannot be called ideal, because there are still various obstacles faced. This obstacle is also a challenge in the implementation of online learning considering that the implementation of online learning is a must so that educational activities can still be held in the midst of the current Covid-19 pandemic emergency. Barriers faced in the implementation of online learning, among others, relate to the readiness of human resources, the lack of clear directions from the local government, the absence of an appropriate curriculum, and limited facilities and infrastructure, especially technology support and internet networks. This then has further implications for the use of digital-based online learning media which may not be maximized properly. The readiness of human resources including educators (teachers and lecturers), students, and parental support is also the most important part in the implementation of online learning. Therefore, further knowledge is needed about the effectiveness of using digital technology-based online learning media so that online learning media can be further developed in a better direction.

The effectiveness of online media during the Covid-19 pandemic in physics subjects requires a fairly in-depth study. However, during the COVID-19 pandemic, which suddenly made all learning activities carried out online, it was effective enough to do. Especially in various math and practical subjects that require more understanding. Therefore, in order to find out the effectiveness of online learning media on learning outcomes for physics subjects during the COVID-19 pandemic, the author feels the need to examine this discussion more deeply.

Method

The method used in writing this article is to review 25 articles about the effectiveness of online learning media on physics subjects during the pandemic. The articles reviewed on average use research methods for the development of physics learning media and methods of testing the effectiveness of physics online learning media. The writing of this article was made using literature study research and literature study. Literature research is research with a series of data collections taking data from the library, reading, taking notes and collecting information related to certain topics being studied (Zed, 2014). The research was conducted by browsing a number of scientific articles found on the google scholar page.

Results and Discussion

Among the functions of online learning media are as follows. First, as a learning management system that provides space between teachers, students and learning resources, such as Google Classroom, Moodle, Schology, and others. Second, as an alternative source of student learning, for example YouTube, Facebook, Instagram, Ruangguru, Quipper, Zenius, and others. Finally, as a tool to demonstrate or practice an experiment, such as the virtual pHET Lab.

One of the ways to optimize online learning is by utilizing e-learning learning media. E-learning is a transformation of the existing learning process in schools or colleges into a digital form that is bridged by internet technology. One of the distance learning applications that can be developed by educators, especially in higher education is the learning management system Hanum (2013). This media provides space for educators (both teachers and lecturers) to closely monitor and facilitate student and student learning progress (Alfina, 2020). The results of research conducted by Affandi (2020) on the Analysis of the Effectiveness of E-Learning Learning Media in Improving the Learning Outcomes of Class X Students in Physics Lessons using the meta-analysis method, namely by combining 8 similar research results found in journals on the Google Scholar site, with the keywords "E-Learning Learning Effectiveness" by finding that each study has different effectiveness values. Based on the results of the analysis, it turns out that the E-learning learning media is effective in improving student learning outcomes with the lowest effectiveness score of 21.72% to the highest 94.47% with an average of 69.67%. This study concludes that e-learning learning media is very effective in improving high school students' learning outcomes in physics subjects. Based on the results of the analysis, it turns out that the E-learning learning media is effective in improving student learning outcomes with the lowest effectiveness score of 21.72% to the highest 94.47% with an average of 69.67%. This study concludes that e-learning learning media is very effective in improving high school students' learning outcomes in physics subjects. Based on the
results of the analysis, it turns out that the E-learning learning media is effective in improving student learning outcomes with the lowest effectiveness score of 21.72% to the highest 94.47% with an average of 69.67%. This study concludes that e-learning learning media is very effective in improving high school students' learning outcomes in physics subjects.

With the implementation of distance learning, there will be great progress towards the development of digital content that is easier to access and understand by students, including online learning collaboration, the use of information exchange applications, such as instant messages or chats (WhatsApp, Telegram, etc.), Line, email and social networks (Facebook, Twitter, Instagram) which ensure that education can be accessed anywhere and anytime. This then provides an opportunity for teachers to take advantage of social media not only as a means of communication, but also as a means of supporting learning. Social media such as Facebook, Instagram, YouTube, WhatsApp and others can be learning media that add references to student learning resources and are able to improve Afina's student learning outcomes (2020). In 2010, Susilawati and Sari (2019) explained that there are several advantages of the Facebook social network. Among them are the social network Facebook is informative, has a grouping feature as a forum for communication among group friends, communication with other people can be easily checked, users can display photos, videos or various internet website links that are in accordance with learning content so that they can expand sources of information from the subject matter obtained.

Nurulhidayah (2020) stated that the use of a phET virtual laboratory in learning can provide facilities in studying a material so as to build science concepts and skills. Nurulhidayah (2020) revealed that the use of the PhET-assisted discovery learning learning model improves student learning outcomes in the cognitive domains C1, C2 and C5 on elasticity and Hooke's law. Another research was conducted by Rahma (2021) regarding the Effectiveness of Using PhET Virtual Lab as a Physics Learning Media on Student Learning Outcomes. This research uses a quantitative method based on Quasi Experimental Design by dividing the population into 2 groups, namely the experimental group and the control group.

The factors that influence the effectiveness of using digital-based online learning media are as follows. First, the feasibility of supporting facilities and infrastructure for online learning activities such as laptops, smart phones and internet networks. Areas with adequate facilities and infrastructure, such as urban areas, will of course have a higher level of effectiveness in using online learning media than rural areas which have relatively less facilities and infrastructure.

In addition, the skills of teachers and students in mastering technology and information are also a further factor that influences the success or failure of online learning media. One of the reasons for the decline in learning motivation and student learning outcomes in online learning is online learning which is monotonous and only focuses on the assignment method. As a result, students become bored and no longer enthusiastic in online learning.

One solution is to develop online learning media based on digital technology. In the development process, advanced skills are needed for teachers so that they can produce an interesting and educative online learning media and can increase students' motivation and interest in learning.

Affandi (2020) added that the success of students in online learning, especially the use of online learning media can be influenced by internal and external factors. Internal factors are factors that come from oneself such as talent, health and others. While external factors are factors that come from outside the self-such as environmental factors, and others.

Conclusion

Based on the results of research and discussion, the following conclusions are obtained. First, online learning media based on digital technology are needed in implementing and developing online learning and in improving high school student learning outcomes in physics subjects. Furthermore, there are differences in learning outcomes between students who do not use online learning media and those who use online learning media. Students who use online learning media have better learning outcomes. The success of students in online learning, especially the use of online learning media can be influenced by internal and external factors. Internal factors are factors that come from oneself such as talent, health and others. While external factors are factors that come from outside the self-such as environmental factors, and others. Finally, the use of digital-based online learning media is very effective in improving the learning outcomes of high school students in physics subjects during the pandemic.

References


Mulyadi, E. (2020). Online Physics Learning Via Whatsapp, Google Form, And Email In The Achievement Of Active Presence And Student Learning Outcomes. *Ideguru: Jurnal Karya Ilmiah Guru*, 5(1), 34. [https://doi.org/10.51169/ideguru.v5i1.156](https://doi.org/10.51169/ideguru.v5i1.156)

