Application of Interactive Virtual Multimedia in Physics Learning

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Abstract

Learning objectives can be achieved requiring strategies such as the application of appropriate learning media so that students are actively involved in the teaching and learning process. The application of alternative media in accordance with Islamic-based learning media in increasing enthusiasm in finding and studying knowledge that can later contribute positively to the welfare of society. One of them is interactive multimedia. Multimedia is a combination of text, photos, graphics, audio, animation and video elements that are processed digitally. This research aims to determine the effect of using interactive multimedia in core physics learning on students' learning interest. The writing method in this research uses a qualitative approach with data collection methods in the form of literature studies. Using the literature study collection method, because the main source is entirely scientific work that is researched without any field observations from the researcher. The research results from this literature review show that interactive multimedia is feasible, interesting and effective as a physics learning medium, especially in core physics material in increasing students' interest in learning physics generally.
Keywords: *interactive multimedia; interest in learning; core physics.*

Abstrak

Tujuan pembelajaran dapat tercapai membutuhkan strategi seperti penerapan media pembelajaran yang tepat agar dalam rangkaian aktivitas bealajar siswa dapat terlibat aktif dan mendapatkan pengalaman belajar. Penerapan media alternatif sesuai dengan media pembelajaran yang berbasis keislaman dalam meningkatkan ghirah dalam menemukan dan mengkaji pengetahuan yang kelak dapat berkontribusi positif pada kemaslahatan masyarakat. Salah satunya yaitu multimedia interaktif. Multimedia merupakan kombinasi teks,foto, grafis, audio, animasi, dan elemen video yang diolah secara digital. Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan multimedia interaktif pada pembelajaran fisika inti terhadap minat belajar siswa. Metode penulisan pada penelitian ini menggunakan pendekatan kualitatif dengan metode pengumpulan data berupa studi literatur. Menggunakan metode pengumpulan studi literatur karena sumber utama sepenuhnya berupa karya ilmiah yang diteliti tanpa ada observasi lapangan dari peneliti. Hasil penelitian dari kajian literatur ini menunjukkan bahwa multimedia interaktif layak, menarik, dan efektif untuk dijadikan sebagai media pembelajaran fisika terutama pada materi fisika dalam meningkatkan minat siswa dalam belajar fisika secara umum.
Kata Kunci: *multimedia interaktif; minat belajar; fisika inti*

INTRODUCTION

Education is a universal human activity. The quality of providing formal and non-formal education must not only be improved in line with advances in science and technology but also be adapted to development and development needs that require special skills and expertise. Education covers many sciences including physics. The role of physics in the world, especially in the development of technology, makes it a strategic subject that plays an important role and must be taught in schools. Currently, most students at school are too busy with physics lessons and memorizing lots of formulas, which causes boredom. Therefore, studying physics requires more understanding than memorizing lots of formulas, so learning physics needs to be more interesting. To anticipate this, one of the things that needs to be supported is appropriate learning media (Rahmawati, 2019).

Learning physics in high school aims to provide window of opportunity for students to internalize physics concepts and their relationships, in addition learn how to use scientific methods based on a scientific approach to solve the problems they face. Thus, when studying physics, students receive several necessary knowledge and skills. For the transition to higher education and the development of science and technology. Therefore, physics is considered an important subject to teach in secondary schools. Physics is a science that is characterized by being complex, complicated, and closely related to real life. The study of physics is also related to the structure of matter, which is described qualitatively and quantitatively from matter on the largest (macro) scale to the smallest (micro) scale. Because of its very complex nature, physics is often considered a subject that is difficult to understand because it is not easy to apply formulas to problems (Nasution, 2023).

Physics subjects are ta lessons that have skills in understanding it. Generally, teachers rely on learning informative fat so that students do not have the necessary skills in Problem solving because students don't able to apply that knowledge have been studied to solve problems about Physics (Mundilarto, 2002:44). as- The vast majority of students still have pan- in the same way that the study of Physics- ka is a difficult lesson. Teacher must use learning media and new learning models for overcome these things. There are some That's a learning model use the discussion method to can influence development knowledge by involving students the so-

called CORE (Connecting, Organizing, Reflecting, Expanding). Teacher are also required to carry out inovation in learning with using useful learning media.

Implementation of Interactive Multimedia in Core-Based Physics Learning for Generic Skills Student Science Ristekdikti Accreditation Decree No: 34/E/KPT/2018 make students more interested lam following the lesson, wrong the other is interactive multimedia with basic flash animation. Learning using ICT simulation media can make it easier for teachers to accept select teaching materials, and reduce the abstractness of the concept of a material anchovies (Galih, et al., 2014). A learning medium is needed to practice skills general knowledge such as the use of a multimedia. Use of multimedia can make learning happen more interesting. Munir (2001), suggests the use of multimedia so that the learning process becomes better effective and meaningful. Teachers can using interactive multimedia and learning so that students can better master the concepts given.

As technology develops so rapidly, it also demands the expansion of education that can support and direct the use of this technology. The improvement of the world of education has a big role in producing a competitive next generation for the nation. Technological developments must be carried out in synergy with educational developments. Technology products as examples of multimedia can be utilized optimally in the learning process. In general, the benefits obtained by using multimedia are that the learning process is more interesting, more effective, and can visualize working principles or abstract concepts to become more concrete so that the problem of tool limitations can be minimized. Tool limitations are no longer an obstacle because visualization of the working principles of a tool can be done well (Nuraini & Supriadi, 2018).

The reason why students become lazy about studying physics is that the learning situation is less supportive of their thinking when studying physics must be structured and there is a lack of interest. Interest is defined as a tendency to like and feel attached to certain things so that there is an urge to carry out an activity without any coercion. Based on this, of course, students will be willing to do something if they like the activity. to increase knowledge, skills, and experience.

This interest grows because the desire to know and understand something encourages and directs students' learning interests so that they are more serious in their learning (Sartika, 2022).

There are several aspects of interest in learning so that individuals can be said to have an interest in an object, including (1) awareness in this case, the student is aware of the existence of an object which gives rise to growing curiosity and a sense of wanting to own the object; (2) attention, related to focusing the mind on an object to the exclusion of other things; (3) will; related to the emergence of self-interest in the form of a desire that leads to a goal to realize something; and (4) feelings of joy; characterized by the tendency of students to carry out an activity without any coercion because they like it. Therefore, it is hopeful that teachers can use strategies in the form of interactive multimedia to make it easier for students to master the material and increase their interest in learning. Using appropriate learning media can help students understand the lesson material. In the physics learning process, practicum is a learning method that provides a direct approach to students in the laboratory.

Previous research conducted by (Wieman & Holmes, 2015), compared the final test results between exploratory group students who received laboratory-based learning with control group students who did not receive laboratory-based learning. The test results showed a higher average for investigational group students with laboratory-based learning compared to the average test results for control group students without laboratory-based learning. According to Bates (2000) in (Falode & Gambari, 2017) the limited laboratory facilities in schools are an inhibiting factor in physics learning that cannot take place optimally and ultimately has an impact on students' low achievement of physics learning outcomes. Physics learning should be oriented towards process skills by conducting experiments so that students have the opportunity to interact with concrete objects and discover concepts from the theory they have studied.

Soetomo (2013) states that the CORE learning model is learning model with methods discussion. According to Wicaksana, et al (2014) the CORE learning model includes four aspects of activities, namely connecting (connecting old information with new information or between concepts), or- ganizing (organizing

information obtained), reflecting (thinking back to that information already obtained), and extending (expanding knowledge). Superiority the CORE learning model includes train students in cooperation and discuss in groups. More students creative because they are more active in the process learning (Beladina, 2013).

The limitations of physics laboratory equipment owned by schools are partly due to quantity and quality. Low-quality laboratory equipment provides less accurate measurement results as the results cannot be used to develop concepts as they should. Apart from that, it is important to remember that not all experiments can be carried out in a real laboratory, not only because of the lack of equipment but also because of the characteristics of the physics material itself that involves abstract processes and concepts that cannot be observed with the naked eye. For example, sound waves cannot be seen with the naked eye for this reason they need to be simulated. According to (SADIK, 2003). The development of technology and information has developed very rapidly to date. This development was also accompanied by developments in science. There are many products and benefits obtained from developments in technology, information and science. One of them is in the world of education. There are many technology outcome that can be used as media for learning, including: Microsoft Power Point, Adobe Flash, Phet, and many other types, both used online and offline. Virtual Laboratory is a virtual simulation that allows laboratory experiment functions on a learning medium. According to (Abdulwahed & Nagy, 2009)

One solution to continue providing learning capabilities within these limitations, or as an alternative material in overcoming the problem of carrying out practicums due to limited laboratory facilities and requiring a lot of time and expensive costs, is virtual practicums. According to (Abdulwahed & Nagy, 2009) this virtual practicum certainly requires a laboratory that is virtual as well called a virtual laboratory.

RESEARCH METHODS

The writing method in this research uses a qualitative approach with data collection methods in the form of literature studies. Using the literature study collection method, because the main source is entirely scientific work that is researched without any field observations from the researcher. The literature studies collected refer to physics learning media which are grouped based on high school physics material. The data analysis technique uses content analysis. The type of data used is secondary data because it comes from existing literature/references and is relevant to the research.

RESULTS AND DISCUSSION

Multimedia is a combination of research trancript photos, graphics, audio, animation, and video elements that are processed digitally. A combination of several multimedia elements that are processed in such a way, usually used for certain purposes, where in this research, multimedia is used as a learning object, in the form of interactive learning material, especially used by high school students. Multimedia has several basic characteristics, namely that it is a computer-controlled system, information is represented digitally, integrated and interactive. Because of these characteristics, a multimedia-based system is worthy of consideration as a format that can be used for the learning process (Wijoyo, 2018).

The use of multimedia as a format for interactive learning materials has now been implemented in various schools. Digital electronic-based technological innovations have radically changed the field of education. This can be seen from the changes that have occurred in the education sector in the past few years. In the past, a teacher gave material that had to be written on the blackboard. Now tools such as computers have made it easier for a teacher/educator to prepare learning materials in the form of digital multimedia presentations that have been designed and created in advance on computer software.

Interest in learning is an impulse within oneself to do something that can make one interested and happy as well as a concentration of attention that contains elements of feeling, pleasure, inclination, an active involuntary desire to receive something from outside (the environment). The indicators for determining a person's interest in learning can be seen in five aspects, namely: 1) Being diligent

in studying, 2) Being diligent in studying, 3) Being diligent in doing assignments, 4) Having a study schedule, and 5) Discipline in studying (Sartika, 2022) .

There are a number of research articles related to the use of interactive media in the learning process there are summarized by researchers to expand their research:

First, the research by Rendi, Andik Purwanto, and Iwan Setiawan entitled "Development of Physics Learning Media Based on the Powtoon Application on Radioactivity Material in High Schools in Seluma Regency". The result of the research shows the Powtoon application developed is in the Very Appropriate category with a percentage of 92.44%, and students' responses to the Powtoon application are in the excellent category with a score of 84.98%. Characteristics of the Powtoon Application contains 38 minutes of learning video, six sub-materials on radioactivity, and two example questions, with animated pictures and handwriting/cartoons.

Second, research by Yuri Yanti, Yumelda Marzuki, and Yolly Sawitri entitled "Meta-Analysis: The Effect of Virtual Laboratory Media in Physics Learning on Student Competence". Appropriate to the meta-analysis results, they can be concluded that virtual laboratory media has a high positive influence on student competence.

Third, research by Sari Badriana, Heny Apriani, and Mega Marito entitled "Development of a QR-CODE Based Physics Module on Core Physics Subjects for Class XII SMA". Based on the fact-findings of the research that has been carried out, the QR Code-based physics module with the core subject of class XII physics is feasible and effective for use as a physics learning medium.

Fourth, research by Fitriani Era Refiana with the title "Development of a Scaffolding-Based YouTube Video Blog Channel as a Virtual Learning Media on Atomic Core Material and Radio-Activities". Based on the results of research and product development that has been conducted, it is known that video blogs based on scaffolding on atomic nucleus material and radioactivities are quite feasible and absorbing. So, after going through several stages of research and development, it

was found out that scaffolding-based YouTube channel video blogs were suitable for use as learning media on atomic nuclei and radioactivities.

Fifth, research by Wahyu Prima Medica (2021) with the title "Use of Virtual Laboratory Media in Learning to increase Knowledge of the Concept of Sound Waves". This research aims to investigate the effect of using virtual laboratory media on students' learning outcomes on the concept of sound waves and to determine students' responses to the use of virtual laboratory media on the concept of sound waves at school. This research used Pre-Experimental Design with a one group pretest-posttest design with a sample of 50 students from one of the high schools in the city of Bandung. The instruments used were questionnaires and student achievement data. The students' learning outcomes showed that the average change in scores increased by 29.2 from the pretest average of 45.2 and the posttest average to 74.4 after learning using virtual laboratory media.

Finally, investigation by Venny Marlina with the research title "Using a Virtual Laboratory Based on Phet Simulation to Determine Half-Life". The PhET simulation-based virtual laboratory for calculating half-lives can be used as a relevant learning media solution to make clear the decay of the isotopes carbon-14 and uranium-238, thereby promoting abstract modern physics that can be analyzed and observed so that it becomes interesting to study.

The research findings show that it is significant to consider the use of interactive multimedia as part of the physics learning approach at school. For further developing quality of physics learning, the development of effective application and relevant interactive multimedia must be the main goal. The application of interactive media can increase students' understanding of physics theories, and encourage them to participate more actively in learning. Apart from that, it is an fun learning tool and contributes to see positive results.

CONCLUTION

The results investigation show that it is fundamental to consider the use of interactive multimedia as representation of the physics learning approach at school. To refine the quality of physics learning, the development and application of effective and relevant interactive multimedia must be the main goal. The use of

interactive media can increase students' understanding of concepts in the context of physics, and encourage them to participate more actively in learning as well. Apart from that, it is an interesting learning tool and helps to see positive results.

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