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Media: The Existence Based on Senior High School Students' Perspective in Physics Learning

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Abstract. The COVID-19 pandemic, Industrial Revolution 4.0, and Society 5.0 have caused significant changes in various aspects of life, including education. This research aims to determine what media are used in physics learning, what kind of media students like and need in implementing physics learning. This quantitative descriptive research describes the existence of media in physics learning based on the answers of respondents consisting of 54 high school students in the city of Padang. The research instrument employed is a Google Form questionnaire validated by experts in learning media development. The media most often used in physics learning is the whiteboard, while the media least frequently used is the virtual laboratory. The media that is most popular with students in learning physics is experimental tools, while the media that is least popular is the whiteboard. The media that students need most in learning physics are experimental tools, while tutorial videos are the ones that are least needed. The results of this research can be used as a reference for schools in developing learning media that suit the needs of students and teachers.

Keywords: learning media, physics learning, student needs

1. Introduction

The COVID-19 pandemic has caused significant changes in various aspects of life, including the world of education [1]. Learning that was previously carried out face-to-face had to switch to bold methods in a short time. Apart from that, the development of the Industrial Revolution 4.0 and Society 5.0 has utilized digital technology and the internet in learning, which has become an obligation in this era [2]. This shift demands learning media that teachers can use to convey or send messages in learning [3] so that students can be more helped in understanding the material, which will ultimately positively influence their learning outcomes [4]. Education plays a vital role in training students to have skills in using technology and media, so that they can adapt to increasingly advanced developments [5].
Learning media is an intermediary and messenger in learning [6]. Learning media helps teachers convey teaching material. Media is also a communication tool that bridges abstract ideas with the real world [7]. Learning media makes it easier for teachers in the learning process. The benefits of other learning media can also help students be more active and able to interact directly with the lesson. Learning media has a significant role in learning activities because it can help convey information from teachers to students or vice versa [8]. Learning media is important because the material delivery becomes clearer, and students will understand the material more easily [9].

In reality, existing learning media often do not meet students' needs, making it difficult for them to understand lesson material [10]. Non-optimal use of learning media by teachers also results in reduced application of learning related to information technology [11]. On the other hand, this situation is exacerbated by using less interesting, less varied, monotonous, and expository learning strategies, so student interactions are not dynamic and result in low opportunities for students to interact actively in learning [12]. The lack of interest in the learning delivered by teachers causes students to feel bored and have difficulty participating in learning activities in class [13].

This research is fundamental because it has a high urgency in improving the quality of learning at the Senior High School (SMA) level, one of which is physics learning. Current physics learning must be implemented by integrating technology, developing 4C skills, and adopting relevant pedagogical approaches [14]. Based on research conducted by Ziola, et al [15], it is known that of the four 4C skills, collaboration skills are in the lowest position while critical thinking skills are in the top position. To effectively develop these skills, an analysis of learning media needs to be carried out so that appropriate solutions can be found to overcome the problems faced by students and teachers [3]. This research also has significant benefits in developing a curriculum that requires learning that makes students active and fun, making learning meaningful [8].

This research aims to find out what media are most often used, liked, and needed by students in carrying out physics learning, by collecting and analyzing the data obtained to conclude phenomena in the field. The results of this research can be used as a reference for schools in developing learning media that suit the needs of students and teachers [16]. Thus, this research has a significant contribution in improving the effectiveness and quality of learning in schools. Therefore, it is hoped that this research can provide an idea to other researchers about what media will be developed in the future to answer educational challenges and fulfill the qualifications for all forms of feasibility tests in terms of validity, practicality, and effectiveness [17].

2. Method

This descriptive study employs a qualitative approach to investigate the presence of media in physics learning. The population of this study comprises all high school students in Padang City, with a sample size of 54 students selected through the implementation of a simple random sampling technique. The research instrument employed is a Google Form questionnaire validated by experts in learning media development. The questionnaire under consideration contains 24 questions with alternative answers on a 1-5 Likert scale. The aspects and types of media included in the questionnaire are shown in Table 1.

Table 1. Aspects and types of media in questionnaire.

Aspect	Types of Media	Items
Use, Interest & Need	Whiteboard	1, 9 & 17
	Picture	2, 10 & 18
	Props	3, 11 & 19
	Experiment Tools	4, 12 & 20
	Tutorial Video	5, 13 & 21
	Animation	6, 14 & 22
	Power Point	7, 15 & 23
	Virtual Laboratory	8, 16 & 24

3. Results and Discussion

There were eight types of media whose existence was questioned by respondents, starting from the most conventional learning media to the most sophisticated media of this century [18]. These media include whiteboards [19], pictures [20], props [21], experiment tools [22] , tutorial video [23], animation [24], power point [25] and virtual laboratory [26]. The following are the results of the analysis of respondents' answers regarding what media are used in learning physics, what media students like and need in carrying out physics learning.

3.1. *Analysis of Media Use in Physics Learning*

The analysis of respondents' answers regarding the frequency of media use in physics learning are presented in Figure 1.

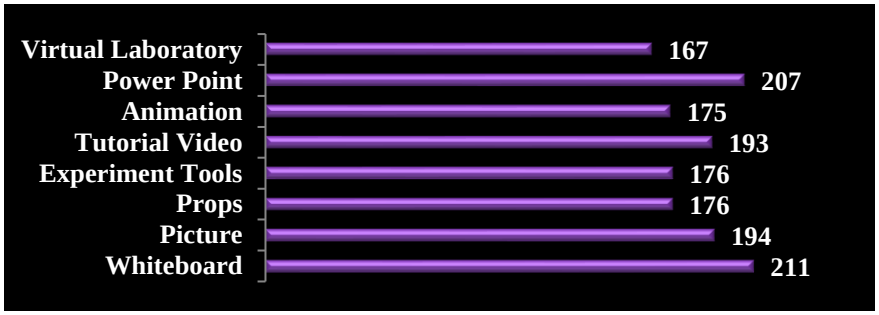

Figure 1. Frequency analysis diagram of media use in physics learning.

Media most often used in physics learning is the whiteboard, which is the simplest media and is always available in almost every school. The whiteboard is the oldest media that accompanies the development of physics learning, where teachers use this media to write down important concepts when explaining lesson material and provide stimulus in the form of practice questions that students can work on directly in front of the class. Media is available in conventional and interactive forms, which are integrated with sophisticated technology [19].

Meanwhile, the media that is rarely used is the virtual laboratory, because the use of this media was only carried out after Covid-19, which indirectly forced experiments to continue, even though they were brave. On the other hand, virtual laboratories are usually only used on physics material that is abstract and the objects are microscopic, so it is not possible to test them using direct experiments. Even though virtual laboratories have been proven to be able to increase motivation [27], interest [28] and student learning outcomes [29] as well as reduce misconceptions [30].

3.2. *Analysis of Student's Interest for Media in Physics Learning*

The analysis of respondents' answers regarding students' interest in media in physics learning are presented in Figure 2.

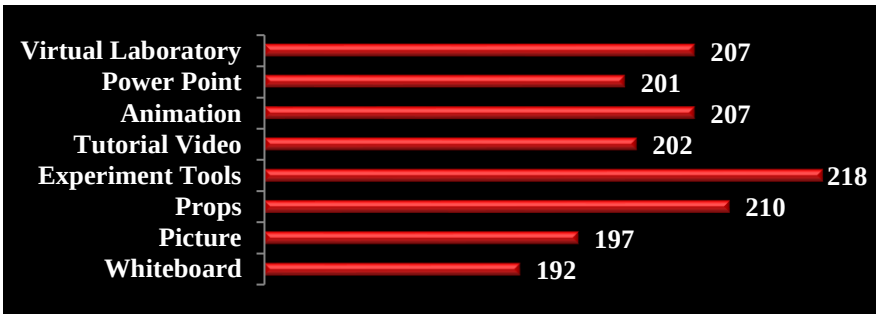

Figure 2. Media interest analysis diagram in physics learning.

Media that students are most interested in in learning physics is experiment tools. Students are interested in all forms of experiments that provide empirical validation regarding the reflection of the theories they learn in class with contextual life, in order to create more meaningful learning. Apart from that, experiments also train students to carry out complex scientific procedures to achieve learning objectives [31] and strengthen mastery of applicable material [32].

On the other hand, the media with the least interest is the whiteboard, because it is seen as the most conventional media and cannot be creative, so students feel bored and are reluctant to be actively involved in learning in class [23]. However, according to research conducted by Muhammad Algorash, currently the use of interactive whiteboards that allow users to interact with digital sender content is being implemented in schools in Saudi Arabia [19].

3.3. *Analysis of Students' Needs for Media in Physics Learning*

The analysis of respondents' answers regarding the intensity of the need for media in physics learning are presented in Figure 3.

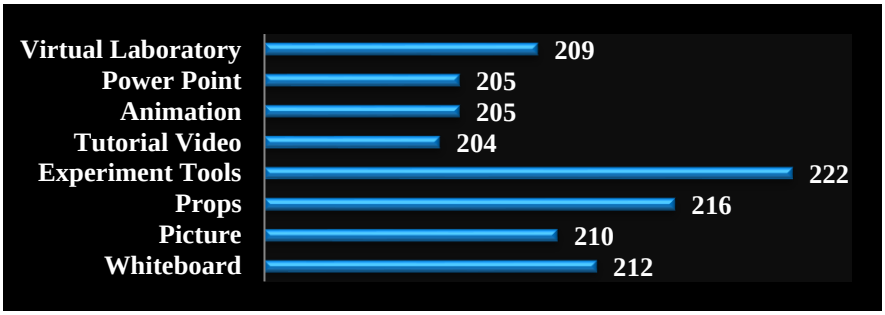

Figure 3. Media needs analysis diagram in physics learning.

Media that students need most in learning physics is experiment tools. Constructivism theory views that laboratories with various equipment in them provide space for students to build their own knowledge through scientific steps in experiments. Therefore, a laboratory is needed that meets the standards for complete infrastructure such as furniture, equipment and tools [33]. such as in the Kalisat High School physics laboratory which has an average percentage of 95% in the very good category [34]. The media that according to students is least needed is tutorial videos. Although basically the format and type of video can be adjusted to suit learning needs [35], this one-way media does not place teachers and students in the same time and space, so it is difficult for students to ask questions about material they do not understand. Apart from that, this media also requires teachers to have high creativity in addition to mastery of technology in creating video-based learning media that can attract students' interest in learning even more [23].

In this study, the sample was selected randomly, without considering the diversity of student characteristics. It is hypothesized that future research can reveal the relationship between the diversity of student characteristics and their perspectives on the presence of media in physics learning. The diversity can be seen from students' ability (high, low, or medium) and learning style (audio, visual, or kinesthetic). It is important to note that this study exclusively examines the students' perspectives on media presence and does not offer insights from the teachers' viewpoint.

4. Conclusion

The media most often used in physics learning is the whiteboard, while the media least frequently used is the virtual laboratory. The media that is most popular with students in learning physics is experiment tools, while the media that is least popular is the whiteboard. The media that students need most in learning physics are experimental tools, while the media that is least needed are tutorial videos.

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