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ANALYSIS OF THE USE OF LEARNING MEDIA AND STUDENTS' PHYSICS LEARNING DIFFICULTIES AT STATE SENIOR HIGH SCHOOL 2 BINJAI

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ABSTRACT

Physics learning plays an important role in developing students' logical, critical, and analytical thinking skills. However, various abstract physics concepts often cause learning difficulties for students. This study aims to analyze the use of learning media and the difficulties experienced by students in learning physics at SMA Negeri 2 Binjai. The study used a qualitative descriptive method with one physics teacher and grade XI-4 students of SMA Negeri 2 Binjai as subjects. Data collection techniques were carried out through observation, interviews, and distributing questionnaires using Google Forms. Data were analyzed using the Miles and Huberman model, which includes data collection, data reduction, data presentation, and drawing conclusions. The results showed that the physics learning process in the classroom had been going quite well and received positive responses from most students. However, several obstacles were still encountered, such as difficulties in understanding abstract concepts, memorizing formulas, and solving calculation and analysis problems. The most frequently used learning media were whiteboards, textbooks, calculators, and infocus. In addition, students also utilized digital technologies such as YouTube and ChatGPT to help understand physics material. The use of technology-based and interactive learning media was considered to be able to increase learning interest and help students understand the material more easily. The development of more innovative and interactive learning media is needed to support the effectiveness of physics learning in schools.

Keywords: physics learning, learning media, learning difficulties, educational technology, high school students.

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INTRODUCTION

Education is a crucial aspect in improving the quality of human resources through an effective and meaningful learning process. Physics learning plays a crucial role in the development of science and technology because it explores various natural phenomena based on scientific concepts, laws, and theories. A good understanding of physics concepts can help students develop critical, logical, and systematic thinking skills. In reality, physics is still considered a difficult subject for most students due to its abstract concepts, mathematical calculations, and complex problem-solving (Wahyuni, 2022).

Students' difficulties in learning physics can be seen in their poor ability to understand concepts, solve problems, and connect physics material to everyday phenomena. Research shows that students still struggle to interpret physics problems, understand conceptual representations, and determine appropriate problem-solving steps. These difficulties are influenced by various factors, both internal and external, such as low interest in learning, lack of motivation, insufficiently varied learning methods, and suboptimal use of learning media (Ady & Warliani, 2022).

Learning media is a crucial component that can help improve the quality of physics learning. The use of learning media can help students understand abstract concepts more concretely through visualizations, simulations, instructional videos, and technology-based interactive media. The use of innovative learning media can increase student interest in learning, conceptual understanding, and learning outcomes in physics. A variety of learning media can also create a more engaging learning environment, making students more active in participating in the learning process (Alumu, 2023).

Advances in educational technology provide opportunities for teachers to utilize various digital learning media in physics teaching. The use of websites as a physics learning medium has been shown to increase student interest in learning. Research shows that most students respond positively to the use of websites as a learning medium because it helps them understand physics material that has previously been considered difficult and boring. Technology-based learning media can also increase student interaction during the learning process (Azzahra et al., 2022).

The development of digital technology has also influenced the learning process in schools. The presence of the internet and Artificial Intelligence (AI) makes it easier for students to find additional learning resources outside of the classroom. Platforms such as YouTube, Google, and ChatGPT are beginning to be utilized by students to help them understand physics material that they find difficult. The use of digital technology in physics learning can help students obtain more flexible and varied explanations of the material. The level of technology use in learning in schools is still not optimal, so its utilization needs to be further developed to support the improvement of the quality of physics learning (Rahmawati & Nugroho, 2023).

Initial observations at SMA Negeri 2 Binjai indicate that the physics learning process has been running quite well, but several obstacles remain. Some students find physics learning interesting and easy to understand, while others struggle to grasp concepts and feel less focused during the lesson. The use of learning media in the classroom is still dominated by whiteboards, textbooks, and projectors, resulting in learning not fully utilizing technology-based interactive learning media.

Research on the use of learning media and difficulties in learning physics is important to understand the current state of physics learning in schools. The research data is expected to provide evaluation material for teachers in developing more innovative, engaging, and student-centered learning strategies and media. This study aims to analyze the use of learning media and the difficulties in learning physics among students at SMA Negeri 2 Binjai.

RESEARCH METHODS

This study employed a qualitative descriptive method. Qualitative descriptive methods were used to describe and analyze physics learning conditions, the use of instructional media, and student learning difficulties based on data obtained in the field. According to A. Muri Yusuf (2017), qualitative research aims to understand naturally occurring phenomena through the collection of data in the form of words, behaviors, and directly observed events.

The research was conducted at SMA Negeri 2 Binjai, located at Jalan Padang No. 8, Rambung Dalam Village, South Binjai District, Binjai City, North Sumatra Province, on May 19, 2026. The research subjects consisted of one physics teacher and grade 11-4 students of SMA Negeri 2 Binjai.

Data collection techniques included observation, interviews, and questionnaires using Google Forms. Observations were conducted to observe the physics learning process, teacher and student activities, and the use of instructional media in the classroom. Interviews with the physics teacher

were conducted to obtain information regarding the learning process, the use of instructional media, student learning difficulties, and obstacles encountered during physics instruction.

In addition, a questionnaire was distributed to students to obtain data on their responses to physics learning, the learning media used, difficulties in learning physics, the use of technology in learning, and their ability to understand and analyze physics material. Questions in the questionnaire were structured based on several indicators, such as learning interest, use of learning media, conceptual understanding, analytical skills, and the use of technology or Artificial Intelligence (AI) in physics learning.

The data analysis technique used the Miles and Huberman interactive analysis model, which includes data collection, data reduction, data presentation, and conclusion drawing. Data from observations, interviews, and questionnaires were then grouped based on the research focus to facilitate the analysis process. The results of the analysis were presented descriptively in narrative form, based on the data obtained in the field.

Data validity was ensured through source triangulation and by comparing data from observations, interviews, and questionnaires to ensure the data obtained was reliable and consistent with actual conditions.

RESULTS AND DISCUSSION

Based on observations and student questionnaires, the physics learning process in grade XI of SMA Negeri 2 Binjai generally proceeded quite well. Most students responded positively to the physics lessons conducted by the teacher. Students stated that the learning process was "fun," "interesting," "easy to understand," and "enjoyable." However, some students also expressed that the learning sometimes made them sleepy because the material explanations were too long and difficult to understand. These results indicate that the physics learning process was proceeding quite well, although several obstacles still occurred that caused students to lose focus during the lesson. This condition can affect students' interest and understanding of the physics material. Zulkarnain and Harahap (2022) explain that the quality of physics learning is influenced by the use of learning media that can facilitate active student engagement. Insufficient media variety has the potential to reduce student attention during the learning process, resulting in less-than optimal conceptual understanding.

Table 1. Student Responses to the Physics Learning Process

Student Response	Information
Exciting and fun	Most students find learning physics quite interesting.
Easy to understand	Some students said the teacher's explanation was clear and easy to understand.
Boring and sleepy	Some students feel that learning is too long and monotonous.
Lack of understanding of the material	Some students have difficulty understanding physics concepts and formulas.

These results indicate that the physics learning process has been going quite well, but several obstacles remain that cause students to lose focus during the lesson. This can impact students' interest and understanding of the physics material.

These learning difficulties indicate that students still experience obstacles in understanding physics concepts in depth. Ady and Warliani (2022) stated that difficulties in learning physics generally arise from the abstract nature of concepts, the extensive use of mathematical formulas, and students' poor ability to connect concepts to everyday phenomena. These conditions can hinder students' ability to solve calculations and analyze physics problems.

Table 2. Physics Learning Difficulties Experienced by Students

Difficulties Experienced	Information
Memorizing formulas	The main difficulties most students experience
Understanding the concept	Students have difficulty understanding abstract concepts of physics
Calculation and analysis of questions	Students have difficulty solving analytical questions
Lack of focus during learning	Some students get sleepy easily and pay less attention to the teacher.

These learning difficulties indicate that students still struggle to understand physics concepts in depth. This is also influenced by the lecture-dominated learning method, which leads to students being less active in the learning process.

Use of Learning Media and Technology

The questionnaire results showed that the most frequently used learning media in physics lessons were whiteboards, textbooks, calculators, and infocus. Furthermore, some students also utilized technology such as YouTube and ChatGPT to help them understand the physics material.

Table 3. Media and Technology Used by Students in Learning Physics

Media/Technology	function
Textbooks and whiteboard	The main media for learning in class
Calculator	Helping with physics calculations
YouTube	Helps understand material through videos
ChatGPT/AI	Helps find explanations and additional information

Most students stated that using learning videos, lab work, and technology-based media helped them understand physics material more easily. This finding aligns with research by Azzahra et al. (2022), which showed that website-based learning media can increase students' interest in learning physics. Rahmawati and Nugroho (2023) also explained that utilizing digital technology can expand students' access to more flexible learning resources. The use of interactive learning media needs to be increased to make the learning process more engaging and effective.

CONCLUSIONS

Based on the research results, it can be concluded that the physics learning process at SMA Negeri 2 Binjai has been going quite well and received a positive response from the majority of students. However, students still experience various learning difficulties, especially in understanding abstract physics concepts, memorizing formulas, and solving calculation and analysis problems. The learning media used are still dominated by whiteboards, textbooks, calculators, and infocus, while the use of digital technologies such as YouTube and ChatGPT has become an additional learning resource for students. The results of the study indicate that the use of more interactive, innovative, and technology-based learning media has the potential to increase learning interest, student engagement, and understanding of physics concepts. Therefore, optimization and development of more varied learning media are needed to support the creation of more effective, interesting, and meaningful physics learning.

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