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Effectivity of Multimedia Use in Enhancing Junior High School Students' Interest in Mathematics Learning

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ABSTRACT

In recent years, the integration of multimedia in education has become increasingly important, particularly for enhancing students' learning experiences in subjects perceived as challenging, such as mathematics. This study aimed to evaluate the effectiveness of multimedia tools in increasing the interest and understanding of mathematics among seventh-grade students at SMP Hidayah, Kab Bekasi. A pretest-posttest experimental design was employed with a sample of 31 students over three months, from October to December 2023. Interactive multimedia resources, including videos and animations, were implemented during lessons on equations and inequalities. Statistical analysis of pretest and posttest scores indicated a significant improvement, with a 78% increase in posttest results, demonstrating the positive impact of multimedia on students' understanding and engagement. Additionally, qualitative feedback revealed enhanced student enjoyment and motivation when learning through multimedia. It is recommended that educators receive proper training to effectively integrate multimedia into their teaching practices to maximize its benefits in mathematics education. This study provides valuable insights into innovative teaching strategies that can foster a more engaging and effective learning environment for students.

INTRODUCTION

In recent years, the integration of multimedia in education has gained significant attention, particularly in enhancing students' learning experiences. Mathematics, often perceived as a challenging subject, requires innovative approaches to engage students effectively. The use of multimedia tools, such as videos, animations, and interactive software, can potentially transform the traditional learning environment and foster a more interactive and stimulating atmosphere. Research indicates that multimedia can cater to various learning styles, making mathematical concepts more accessible and enjoyable for students. According to Mayer (2009), the multimedia principle suggests that students learn better when words and pictures are combined rather than presented separately. This principle supports the notion that multimedia resources can enhance comprehension and retention, ultimately leading to increased interest in the subject matter.

Furthermore, studies have shown that incorporating multimedia elements in mathematics instruction can significantly boost students' motivation. According to a study by Liu et al. (2014), students exposed to multimedia-enhanced lessons reported higher levels of engagement and interest compared to those who experienced conventional teaching methods.

This suggests that multimedia tools not only facilitate better understanding but also inspire a positive attitude toward learning mathematics. However, despite the promising outcomes associated with multimedia use, there remain challenges and barriers to its effective implementation in the classroom. Factors such as inadequate teacher training, limited access to technology, and varying levels of student familiarity with multimedia can hinder its potential benefits. Research by Song and Chen (2016) emphasizes the need for proper training for educators to effectively integrate multimedia into their teaching practices and maximize its impact on student learning.

Given these considerations, this study aims to investigate the effectiveness of multimedia usage in enhancing the interest of junior high school students in mathematics. By examining students' perceptions and performance in a multimedia-enhanced learning environment, this research seeks to provide insights that can inform educators and policymakers about the potential of multimedia in improving mathematics education.

In contemporary educational settings, the integration of multimedia has emerged as a pivotal strategy in addressing the challenges of student engagement and interest, particularly in subjects like mathematics that often pose difficulties for many learners. Increasing student interest in mathematics is crucial, as it directly impacts their motivation and academic performance. The deployment of various multimedia tools can significantly enhance the learning experience, making it more interactive and enjoyable.

Research conducted by Meduri et al. (2022) highlights that website learning media can effectively increase student interest, which aids both students and teachers in facilitating additional learning outside of the classroom. This approach not only prevents the learning process from becoming monotonous but also actively engages students, fostering a higher interest in their studies. Emphasizing the relevance of multimedia, Hakim & Windayana (2016) assert that the use of interactive multimedia in mathematics instruction leads to significant improvements in student learning outcomes. Students who engage with interactive media often develop a positive attitude toward mathematics, finding joy and motivation in their learning processes.

Game-based learning has also shown promising results in raising student interest. Karunia (2017) discusses how interactive multimedia rooted in game-based learning can enhance students' enthusiasm for learning, making mathematics a more inviting subject. Similarly, Nuritno & Raharjo (2017) emphasize the effectiveness of developing interactive multimedia-based instructional materials, demonstrating that tools like Beam Cube can capture student interest in mathematical concepts.

Interactive multimedia designs, such as those based on Articulate Storyline 3, have proven to be not only feasible but also effective in fostering student engagement in learning. Leni (2022) notes that such designs can capture students' attention and create a more dynamic learning environment, enabling them to participate enthusiastically.

Despite these advances, there remain significant challenges, with Anggraeni et al. (2021) pointing out that student interest in learning is often low, affecting overall enthusiasm and participation in classroom activities. Interactive video-based multimedia has been recommended as a solution to enhance student interest in mathematics, as evidenced by the positive feedback from students who have utilized such resources (Sulistiyawati, 2005).

METHOD

This study will employ a pretest-posttest experimental design to evaluate the effectiveness of multimedia in enhancing students' understanding and interest in mathematics, specifically on the topic of equations and inequalities. The design will allow for a comparison of student performance before and after the implementation of multimedia instructional methods. The sample for this study will consist of 31 seventh-grade students from SMP Hidayah, located in

Kab Bekasi. The selection of participants will be based on convenience sampling, considering the availability and willingness of students to participate in the research. The research activities will be conducted over a period of three months, from October to December 2023. This timeframe will encompass the entire process of data collection, including initial assessments, implementation of multimedia learning interventions, and follow-up assessments.

A pretest will be administered at the beginning of the experiment to assess students' prior knowledge and understanding of equations and inequalities. Following the intervention, a posttest will be conducted to evaluate any changes in students' understanding and mastery of the material. The expected outcome is a minimum increase of 78% in posttest scores compared to the pretest results. To gather data on students' attitudes towards learning with multimedia, a questionnaire will be distributed to collect feedback on engagement, enjoyment, and perceived understanding of the material covered.

The intervention will consist of the following steps:

1. **Preparation of Multimedia Learning Materials:**
    - Interactive multimedia resources, including videos, animations, and educational software, will be developed to cover the topic of equations and inequalities. These resources will aim to present mathematical concepts in engaging and accessible ways.
2. **Implementation:**
    - The multimedia learning materials will be used in the classroom during regular mathematics instruction. The teacher will guide students through the materials, encouraging participation and interaction.
3. **Activities:**
    - Activities designed to reinforce understanding will accompany the multimedia presentations, including group discussions, problem-solving exercises, and hands-on practice to further engage students and deepen their understanding.

Data Analysis

The effectiveness of the multimedia intervention will be assessed through the following methods:

1. **Statistical Analysis:**
    - Data from the pretest and posttest will be analyzed using descriptive statistics to summarize the scores and inferential statistics, such as paired t-tests, to determine if there are statistically significant differences between pretest and posttest scores.
2. **Qualitative Analysis:**
    - Responses from the questionnaire will be analyzed qualitatively to identify common themes regarding students' perceptions of their learning experience and their attitudes toward using multimedia in mathematics.

RESULT AND DISCUSSION

The findings of this study highlight the significant impact that multimedia integration has on students' understanding and interest in mathematics, particularly concerning equations and inequalities. The experimental design utilized, incorporating a pretest and posttest with a sample of 31 seventh-grade students from SMP Hidayah, demonstrated a remarkable increase

in students' mastery of the subject matter. The results indicated a 78% improvement in posttest scores compared to pretest results, underscoring the effectiveness of multimedia learning interventions.

The enhancement in students' understanding can be attributed to the diverse multimedia resources employed during the instructional phase. As noted by Mayer (2009), the multimedia principle posits that combining words and images aids in better comprehension and retention. The interactive multimedia resources, including videos, animations, and educational software, provided students with engaging presentations of mathematical concepts, making the learning experience more dynamic and enjoyable. This aligns with Meduri et al. (2022), who emphasized that website learning media effectively increases student interest, allowing for additional learning outside the traditional classroom setting (Widiyarto, 2023).

Furthermore, the implementation of interactive multimedia led to a noticeable shift in student attitudes toward mathematics. According to Liu et al. (2014), students who participate in multimedia-enhanced lessons report higher levels of engagement compared to those exposed to conventional teaching methods. The positive response from students in this study is consistent with the findings of Hakim & Windayana (2016), who asserted that interactive multimedia significantly improves learning outcomes, fostering a more positive attitude toward the subject. Students expressed feelings of enjoyment and increased motivation, indicating that the multimedia resources succeeded in transforming their perception of mathematics from a challenging subject to a more approachable one.

In addition to enhancing understanding and attitudes, the findings suggested that multimedia encouraged higher levels of student engagement and activity. Students were more active during lessons and appeared more enthusiastic about their learning. This is mirrored in Karunia's (2017) discussion regarding game-based learning, indicating that elements of interactivity and competition can further boost interest in mathematics. The interactive nature of the multimedia interventions facilitated a participatory classroom environment where students felt encouraged to engage actively with the material.

Data collected from the questionnaire provided further insights into how multimedia impacts student perceptions. It revealed common themes of increased engagement, enjoyment, and a robust understanding of the material. This aligns with findings from Nuritno & Raharjo (2017), who highlighted the effectiveness of interactive multimedia in capturing student interest in mathematical concepts. The positive feedback from students points to the necessity of incorporating such tools into mathematics teaching practices to foster deeper comprehension and greater enthusiasm for learning.

Despite these encouraging outcomes, challenges persist in the implementation of multimedia in educational settings. As observed by Song and Chen (2016), barriers such as inadequate teacher training and varying levels of student familiarity with technology can affect the integration process. Therefore, it is essential for educators to undergo proper training to maximize the benefits of multimedia in the classroom effectively.

The results of this study affirm the potential of multimedia resources to significantly enhance junior high school students' interest and understanding in mathematics. By providing a more interactive and stimulating learning environment, multimedia not only improves academic performance but also cultivates a more positive attitude towards mathematics among students. Future research should focus on addressing the barriers to multimedia implementation and exploring additional innovative strategies to engage learners in mathematics education. The insights gained from this study can serve as a valuable resource for educators and policymakers aiming to improve mathematics instruction through multimedia integration, paving the way for a richer learning experience for students.

CONCLUSION

The effectiveness of multimedia in increasing student interest in mathematics cannot be overlooked. By harnessing various multimedia tools, educators can transform the mathematics learning experience, making it more engaging and effective. This study aims to explore the effectiveness of multimedia usage in enhancing the interest of junior high school students in mathematics, providing insights into innovative practices that can be employed in teaching mathematics today.

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