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INCREASING STUDENT INTEREST AND MOTIVATION IN LEARNING WITH AUGMENTED REALITY TECHNOLOGY

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Abstract

Augmented reality has opened a new window in the digital learning paradigm. Its presence in the realm of education has brought about a number of impressive benefits. In many educational domains, research and development are now centered on the use of augmented reality to boost students' motivation to learn. It has been demonstrated that integrating augmented reality (AR) into the classroom improves student engagement, enriches the educational process, and raises students' interest in learning. Students can have more efficient learning experiences with AR technology, interactive, and realistic learning. For example, the development of a virus learning application using AR technology has helped students learn microorganisms such as viruses better, as well as increasing students' interest in learning in studying human blood circulation. Thus, Students' interest and drive to learn can be heightened by the use of augmented reality (AR) technology in the classroom, which can offer an engaging, dynamic, and realistic learning environment. This shows the great potential of AR technology in creating a more interesting and effective learning environment for students.

Keywords: Increase, interest, motivation, technology, augmented reality

INTRODUCTION

Schools are educational institutions that serve as a place for students to shape their character, intelligence, and creativity. To achieve this, of course, schools also need qualified educators and appropriate media and learning methods. In the current era of technological development, of course, the

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younger generation is able to easily use and get easy access to it. Therefore, the learning that is carried out must also be varied and follow existing technological developments (Khan et al., 2019). According to Ki Hadjar Dewantara, education is a means of encouraging change and forming a civilization so that it is necessary to pay attention to the nature of nature and the nature of the times. As educators, they must understand that every child is born with a different nature so that they have different characteristics, besides that educators need to pay attention to the nature of the times, such as the current era of the industrial revolution 4.0 where teachers must equip students with 21st century skills based on technology. This is similar to what Suparlan said regarding Ki Hadjar Dewantara's educational philosophy and his contribution to Indonesian education (Saadon et al., 2020). Highlighting 21st century education, technology is a very necessary learning support. Some of the benefits of technology in learning as stated by Mariyati that technology has a major role in improving the quality of learning and student motivation to learn and helping in constructing student knowledge effectively and efficiently. (Anuar et al., 2021). Learning media is very much needed as an intermediary for conveying messages, in order to minimize failure during the communication process. Hanafi et al., (2017) stated that the learning process is the process of conveying messages or materials from the message giver (teacher) to the message recipient (students). In order to prevent boredom, the learning materials chosen for students or learners must be engaging. Technology known as "augmented reality" mixes two- or three-dimensional virtual items and projects them in real time (Chin, K. Y., & Wang, C. S. (2021).

Technology that blends the actual and virtual worlds, allows for real-time interaction, and takes the shape of three-dimensional animation is known as augmented reality (Tsarapkina, J., & Anisimova, 2020). Applications for augmented reality have been implemented in many different domains. The idea behind augmented reality applications is to merge the actual world (i.e., physical things) with the digital world without altering the shape of the real object. Text and image object recognition is employed as a technique for information display. So that Augmented reality is said to be a cognitive system that is able to fully understand the perception of users (Videnovik et al., 2020). Augmented reality has opened a new window in the digital learning paradigm. This technology combines digital information into the physical environment, enriching students' learning experiences through devices such as smartphones. Its presence in the realm of education has brought about a number of impressive benefits. One of them is its ability to present more interesting and

interactive learning, encouraging students' motivation to learn more effectively. Thanks to AR, students can explore history, science, or even understand abstract concepts more visually and attractively (Abdullah et al., 2022).

Mat-jizat et al., (2017) stated that the use of AR in learning provides an unforgettable experience for students. With its ability to integrate digital information into the real world, AR creates a more interesting and interactive learning environment. For example, in the study of history, students can visit historical sites through AR applications, see ancient building structures, and obtain related information directly through their devices. This not only arouses students' interest in learning, but also triggers their creativity in digging deeper into knowledge. The high interest of students in digital technology, such as games and applications, shows that the use of AR in education has great potential to increase student engagement in the learning process (Cabero-Almenara, J., & Roig-Vila, 2019). By integrating technology that is familiar to students into the learning process, the opportunity to increase their interest in learning and academic achievement becomes greater. However, despite its positive potential, the application of AR in the educational context is still not widespread. Many schools and educational institutions still do not utilize this technology optimally in presenting learning materials (Bacca et al., 2018). Therefore, research investigating the effect of AR implementation in increasing students' learning interest is relevant to understand the potential and challenges in adopting this technology in the educational context. In developing effective learning strategies, it is important to understand in depth how AR technology can affect students' motivation and learning interest (Erbas, C., & Demirer, 2019).

One of the challenges in learning is understanding complex concepts, especially in science. AR is present as a solution with its ability to visualize abstract concepts more realistically. In science studies, students can use AR to understand molecular structures, the solar system, or natural phenomena that are difficult to understand theoretically. Thus, AR facilitates the student's learning process by presenting information in a more concrete and easy-to-understand form. In addition to being a learning tool, AR can also be applied in testing and evaluation. Through the AR application, students can take quizzes or interactive games that aim to test their understanding of the material that has been studied. This not only tests students' knowledge in a fun way, but also helps teachers to evaluate the extent to which students understand the

material being taught. Thus, AR is not only a learning tool, but also an effective evaluation tool.

The application of augmented reality in education promises a major change in the way students learn and interact with learning materials. Despite facing a number of challenges, AR's great potential to increase student motivation, engagement, and facilitate the understanding of difficult concepts makes it a valuable investment for a more dynamic and effective future of education (Li et al., 2014). With the right steps in overcoming existing obstacles, augmented reality has great potential to become a revolutionary learning tool and change the paradigm of education in the future.

RESEARCH METHOD

This study uses a descriptive method by collecting data from various reliable sources, including literature studies and recent publications. A descriptive approach is used to describe increasing students' interest and motivation to learn with augmented reality technology. The first stage in this research method is collecting literature relevant to the research topic. A literature search is conducted through academic databases, scientific journals, and related publications that discuss increasing students' interest and motivation to learn with augmented reality technology. The selected literature must be of good quality and relevant to the research objectives. After collecting the literature, an analysis and synthesis of the information found is carried out. Relevant data and information about students' interest and motivation to learn, the definition of augmented reality in learning, the challenges of using augmented reality in learning, the application of augmented reality technology in increasing students' interest in learning related to the research topic.

RESULT AND DISCUSSION

Student Learning Interests and Motivation

According to Wahyuni et al., (2020) learning interest can be defined as the extent to which a student is interested or involved in a particular activity. This includes the student's attitude, motivation, and involvement with the material. When given the freedom to choose, people are motivated by their interests to do the actions they choose. The primary determinant of the level of student learning activity is their enthusiasm in learning. In other words, interest can be a cause or a motivating element for an action. Interest plays a major role in determining the attitude that drives someone to be active in a work or circumstance. When there is motivation, interest a mix of aptitude and desire

can grow. Students' enthusiasm and focus in learning are prerequisites for effective teaching and learning environments. Learning motivation is a non-intellectual psychological component that helps people develop a love of learning (Rone et al., 2023).

Learning motivation can be observed from the way students behave in terms of their curiosity, focus, acute attention, and persistence in reaching their objectives (Filgona et al., 2020). The degree of success or failure of student learning activities is determined by motivation. Learning that is driven is essentially learning that is in accordance with the needs, drives, motives, and interests of students. The use of the principle of motivation is essential in the learning and teaching process. Motivation is something that greatly influences the learning process, because people who do not have motivation cannot carry out learning activities. Motivation is the power that propels or draws conduct in the direction of an objective.

Definition of Augmented Reality in Learning

According to Molnár, G., Szűts, Z., & Biró, K. (2018), augmented reality (AR) is a technology that makes learning more engaging and motivating for students by transforming items into three dimensions and realizing the virtual world in the real world. Combining virtual things (text, photos, and animations) with the actual world is known as augmented reality (AR) technology, so that it can make students feel as if they are faced with objects being studied in real time and the teaching and learning process becomes more enjoyable and easier to understand the subject matter.

AR is still infrequently employed in education, but it is currently widely used in the gaming, medical, and image processing industries. Numerous augmented reality applications aim to give consumers more precise information derived from actual items. One example is the use of ultrasonic technology in ultrasonography (USG) to view the state of a woman's womb and the movements made by the fetus, which are shown directly and in real time on a screen. The use of augmented reality in instructional media might encourage students to think critically about issues and situations that arise in daily life. It is well recognized that the purpose of educational media is to support learners both with and without teachers (Dunleavy, M., & Dede, 2014). In order for students to engage in the learning process wherever and whenever they choose, the utilization of AR-enabled educational media can directly give learning. Through AR technology, it is hoped that learning carried out offline or online can be more enjoyable so that students' interest and motivation to learn

will increase. In addition, with AR technology, the implementation of independent learning, namely learning from anywhere and anytime, can be realized properly.

Augmented Reality (AR) in learning can be defined as a system that projects virtual items in real time, combining two- or three-dimensional objects into a real three-dimensional scope. According to Dutta, K. (2015), augmented reality (AR) is a technology that makes the virtual world a reality and has the ability to transform objects into 3D (three-dimensional) objects. As a result, learning becomes more engaging and inspires pupils. Using AR to enhance learning provides a new color in the field of education, not only centered on insight, but also touching the emotional side of students. Its use can stimulate students' brains to absorb knowledge more progressively (Kyza, E. A., & Georgiou, 2019).

The AR concept collaborates the real world and the virtual world which displays more detailed information in 2D or 3D visuals. AR-enabled instructional materials can encourage pupils to think critically about a subject. With AR technology, learning becomes more interesting and provides more motivation for students. AR can also be utilized as a multimedia learning tool that shows 3D items and their animated representations of realistic environments side by side with audio-based information about those objects, so that it can be used as an alternative learning medium to introduce a subject matter. Thus, Augmented Reality in learning is an innovation that attracts student activity, is able to increase student motivation, and provides a more interactive and interesting learning experience.

Challenges of Using Augmented Reality in Learning

Despite its great potential, the use of AR according to Akçayır, M., & Akçayır, G. (2017) in learning is also faced with a number of obstacles that must be overcome for its optimal implementation.

1. Technology and Cost Limitations

   One of the main challenges in adopting AR in the classroom is the limitations of technology and the costs associated with it. The use of AR technology requires special devices that are sometimes expensive and not all educational institutions can afford them. In addition, to run AR smoothly, a stable and fast internet connection is also needed, which is not necessarily available in all areas.
2. Curriculum Suitability and Technology Integration

The integration of AR into the educational curriculum is also an important concern. It is important for educational institutions to ensure that the use of AR is in accordance with the needs of the curriculum and learning objectives. In addition, educators also need to receive adequate training to understand how best to integrate this technology into the learning process.

3. Accessibility and Availability of Quality AR Content
   The availability of quality AR content is also a key factor. Although AR technology has developed rapidly, quality AR educational content is still limited. Investment is needed in developing relevant educational content that supports the curriculum to maximize the potential of AR in learning.
4. Difficulty in Determining the Use of AR Applications in Learning
   The use of AR applications in learning can cause difficulties in determining how AR applications should be used in learning. This shows the need for careful thought in integrating AR technology into the learning curriculum.
5. Constraints in Content Development
   Creating quality AR content requires a lot of time and money. If there is not enough budget or resources for the development of appropriate AR content, this can reduce the effectiveness of its use.
6. Infrastructure and Resource Limitations
   The use of AR in learning requires adequate infrastructure and resources, such as supporting technological devices, internet access, and special software. These limitations can be obstacles to implementing AR widely in educational environments.
7. Awareness and TrainingAnother challenge is awareness and training for educators in using AR technology effectively in the learning process. Efforts are needed to ensure that educators have sufficient understanding and skills in integrating AR into their teaching methods.

Despite facing a number of challenges, AR's great potential to increase student motivation, engagement, and facilitate the understanding of difficult concepts makes it a worthwhile investment for a more dynamic and effective future of education (Alzahrani, 2020).

Application of Augmented Reality Technology in Increasing Students' Interest in Learning

The application of Augmented Reality technology in presenting learning materials can significantly increase students' interest in learning (Iatsyshyn et al., 2020). Students may learn in an engaging and demanding setting because to AR's immersive and interactive learning experience. The application of

augmented reality technology has the potential to raise learning engagement among students. The capacity to engage directly with educational materials in a real context encourages active participation and better understanding

The importance of design and content factors in the effectiveness of the application of augmented reality technology in increasing students' interest in learning. Attractive design and content that is relevant to the curriculum help enhance the benefits of augmented reality (AR) in education (Pranoto, H., & Panggabean, 2019). Consequently, the findings of this research offer a deep understanding of the impact and implications of the application of augmented reality technology in increasing students' interest in learning, as well as providing guidance for further development in technology-based education.

In an era where technology is increasingly pervasive in various aspects of human life, it is undeniable that education is also undergoing significant transformation. One of the prominent innovations in the context of learning is the application of AR (augmented reality) technology. AR has a lot of promise to give students more immersive, dynamic, and interesting learning experiences (Hidayat et al., 2021). In this study, we investigate how augmented reality technology can be used in educational settings with a focus on how it can enhance students' learning interest and motivation. This introduction leads to a deeper understanding of the importance of understanding how AR technology can change the learning paradigm. This technology not only presents information but also allows students to interact directly with learning materials in a real-world environment. By creating more dynamic and real-world relevant learning experiences, AR promises the potential to increase student engagement and spark their interest in learning. However, as with any innovation in education, the application of AR technology also faces a number of challenges and considerations (Kononova et al., 2019).

One of them is the infrastructure issue, where not all educational institutions have adequate access to the hardware and software needed to support the use of AR. In addition, teacher training is also a key factor in the success of implementing AR in learning. Teachers need to understand not only how to use this technology effectively, but also how to integrate it into the existing curriculum. In overcoming these challenges, collaboration between various parties, including the government, educational institutions, the technology industry, and the education community is crucial. Investment in technological infrastructure, teacher training, and the development of learning content that is in accordance with curriculum needs are steps that need to be considered to support the use of AR in education widely. Furthermore, it is

important to explore the potential of AR technology in increasing students' interest in learning from various perspectives. For example, research can explore how the right AR content design can stimulate students' interest in learning or how psychological factors influence students' perceptions of the learning experience using AR (Wahyuanto et al., 2024). In addition, the long-term impact of using AR technology in learning also needs to be considered. Although AR offers many benefits, including increasing students' interest in learning, we also need to consider its social, ethical, and psychological implications. This includes questions about how the use of AR technology can affect social interactions between students, or whether This technology's use may result in unequal access to education. Thus, research on the application of augmented reality technology in increasing students' interest in learning not only opens the door to progress in technology-based education, but also encourages deep reflection on the role of technology in shaping the future of learning. With a holistic and collaborative approach, we can optimize the potential of augmented reality technology to produce more inclusive and relevant learning environments for all students (Rezende et al., 2017).

According to Saidin et al., (2015) the use of augmented reality (AR) to boost students' motivation to learn has drawn attention from researchers and developers across a range of educational domains. Here are a few instances of how augmented reality has been used to boost students' curiosity in their studies:

Increasing Interest in Learning Mandarin: A study shows that the application of AR technology for students can increase interest in learning Mandarin at school.

Increasing Interest in Learning Physics: The relationship between interest in learning and physics learning achievement has also been proven in a study, where AR can provide learning motivation to students.

Increasing Interest in Learning Chemistry: The development of learning media on the shape of chemical molecules using Android-based AR has been proven to increase students' interest in understanding chemical material. Increasing Interest in Learning in Other Subjects: Apart from that, AR has also been used to increase interest in learning in other subjects, such as mathematics, history and social fields.

Increasing Student Engagement: The use of AR in learning can also increase student engagement through interactive visualization and gamification elements, which in turn can increase learning motivation. Thus, The use of augmented reality in teaching has been demonstrated to have a positive impact

in increasing student interest in learning, enriching the learning experience, and increasing student involvement in the learning process.

CONCLUSION

The application of It has been demonstrated that using augmented reality (AR) technology in the classroom increases students' motivation and interest in the material. Students' interest in studying may rise when augmented reality technology is used in the classroom. Moreover, creating educational software utilizing Virtual Reality (VR) technology has emerged as a key priority for raising students' motivation and learning outcomes in schools. This application brings students into an interesting, realistic, interactive, and fun learning environment, which can help overcome boredom and lack of interest in learning, as well as increase student engagement in class. With AR technology, students can experience more effective, interactive, and realistic learning. For example, the development of a virus learning application using AR technology has helped students learn microorganisms such as viruses better, as well as increased students' interest in learning in studying human blood circulation material. Thus, the application of AR technology in learning can provide an interesting, interactive, and realistic learning experience, which can increase students' interest and motivation in learning. This shows the great potential of AR technology in creating a more interesting and effective learning environment for students.

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