

Use and Application of Virtual Reality (VR) in Learning Optimization and Effectiveness to Increase Student Interest in Learning: A Study Using Systematic Literature Review (SLR) Method

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Abstract - The adoption of digital learning media has revolutionized the way we learn and teach. Within the context of educational systems, there is often a need for new media. These innovative media are expected to ignite students' motivation to learn. Furthermore, their integration into educational systems aims to enhance student achievements both academically and beyond. Digital media holds significant potential for improving student learning experiences. This study focuses on a literature review related to the utilization of digital learning environments in education. In today's rapidly evolving landscape, many learning materials have transitioned from print-based to digital formats. The widespread adoption of digital media in education includes cutting-edge technologies such as virtual reality (VR). VR serves as a creative and immersive learning tool, transporting students to novel realms that are challenging to explore through traditional teaching methods. Research consistently emphasizes the importance of technology-based learning environments in the 21st century. These media facilitate student engagement, making learning more interactive and effective. Ultimately, learning media encompasses any medium that effectively conveys messages or information between students and educators, capturing their attention, interests, thoughts, and emotions to achieve educational goals.

Keywords :

Virtual Reality (VR);

Digital Learning

Environments;

Learning Optimization;

Article History:

Received: 03-02-2024

Revised: 11-03-2024

Accepted: 14-04-2024

Article DOI : 10.22441/collabits.v1i2.27264

1. INTRODUCTION

Teaching and learning activities involve interactions between students and educators, requiring suitable media and learning materials. These activities serve as a bridge between educators and students to achieve the core of the learning process. While familiar with various traditional learning media such as audio, visual, audio-visual, print, and e-learning, there are still many unexplored learning media options. As technology continues to evolve, learning media should adapt and innovate accordingly. The rapid growth of digital technology in the Fourth Industrial Revolution has significantly impacted human culture, leading to the emergence of a digital culture. Online technology influences daily offline habits, and education plays a crucial role in shaping human resources in the Society 5.0 era. Schools and teachers now encourage diverse information sources beyond traditional materials, including the internet and social media. Virtual Reality (VR) technology stands out as an innovative solution. VR applications offer creative learning experiences, bringing real-world scenarios into the classroom. Efficiency and material savings are additional benefits of VR technology. Despite the decline in interest in online learning systems due to student boredom, there is an opportunity to rekindle enthusiasm and addiction to learning. Innovative learning media, particularly VR-based solutions, can enhance the

teaching and learning process. By simulating real-life experiences, VR bridges the gap between classroom learning and students' daily lives. The impact of VR extends across various fields, including medicine, architecture, aviation, entertainment, and education (Herlangga, 2018).

2. METHODOLOGY

Systematic Literature Review (SLR) refers to a method for identifying, evaluating, and interpreting all relevant research related to a specific problem or topic. It involves assessing available research evidence to address specific research questions. SLR aims to provide comprehensive insights by analyzing existing studies. In the context of education, SLR research seeks to identify, evaluate, and interpret relevant research findings. The goal is to introduce technology to students, enhancing their interest in learning and promoting more effective and interactive educational experiences..

3. RESULTS AND DISCUSSION

The outcomes of the systematic literature review study, along with the analysis and summary of articles related to learning media, are presented in the following table.

Journal Title	Researchers	Results and Discussion
Analyzing the Impact of Virtual Reality on the Advancement of Education in Indonesia.	Charles, Delvian Yosuky, Tio Sania Rachmi, Eryc	The Behavior and Intention of Using Virtual Reality for Educational Media in Indonesia. The solution involves creating a more comfortable, enjoyable, and creatively innovative classroom learning experience for all interests by incorporating Virtual Reality.
Introduction of Virtual Reality and Augmented Reality Technology to Enhance Digital Learning at Al Muin Syarif Hidayatullah Islamic Boarding School.	Rizqi Putri Nourma Budiarti, Endang Sulistyani, Fitria Angraini, Hanifah Citra Marvyna, Manilaturrohmah	The community service activity successfully captured participants' interest in learning about virtual reality (VR) and augmented reality (AR) technologies as interactive learning media. During this event, there was approximately a 45% improvement in understanding VR(AR) technology, and the participants expressed that this community service activity was highly beneficial.
Using Virtual Reality (VR) Technology as an Effort to Escalate Interest and Optimization in the Online Learning Process During the Pandemic.	Soni Ariatama, Muhammad Mona Adha, Rohman, Ahman Tosy Hartino, Eska Prawisudawati Ulpa	The development of Virtual Reality (VR) learning media requires collaboration between government entities and developers. These

		developers can be students or institutions specializing in Virtual Reality (VR) technology. Looking ahead, as VR technology continues to evolve in the field of education in Indonesia, it can be applied across various educational sectors, including medical practice simulations, disaster response training, engineering labs, and more.
Implementing Virtual Reality Metaverse Technology in Early Childhood Education	Alfarez Santosa, Achmad Yudi Wahyudin, Rido Febriansyah	The innovation of three-dimensional virtual space technology is currently piquing the curiosity of many people due to its rapid development and widespread adoption across various life sectors. The target audience for this technology includes young children who need to be prepared for technological advancements, and it has yielded several satisfying outcomes.
Socializing the Use of Virtual Reality Technology in Education to Embrace the	Sarah Inayah, Tatang Herman, Dadang Juandi, Samsul Pahmi, Rani Sugiarni, Edi Supriyadi,	This online socialization activity aims to provide guidance and education to

Metaverse Era.	Ahmad Lutfi Fauzi, Ratu Sarah Fauziah Iskandar, Mahmudin	prospective teacher students regarding the use of virtual reality technology in education. The activity involves several stages: survey, socialization, Q&A, and evaluation. The topic selection related to the use of virtual reality and augmented reality in teaching has captured the attention of prospective teacher students, and after receiving the material exposure, they plan to develop teaching materials using both virtual reality and augmented reality technologies.
Semi-Immersive Virtual Reality to Enhance Student Motivation and Cognitive Abilities in Learning.	Mira Suryani, Erick Paulus, Riva Farabi	From the statistical testing results, students' cognitive abilities demonstrated a significant difference after using the VR application, with a P-value of 0.448 compared to their cognitive abilities before using the VR application. In terms of motivation, it can be concluded that, on average, students agreed with each questionnaire statement,

		indicating an improvement in learning motivation when using the VR application.
Training on the Implementation of Virtual Reality as a Digital-Based Learning Medium to Enhance Pedagogical Competence of Elementary School Teachers in the Cipanas District	Jauhar Helmie, Vina Nurviyani, Iis Ristiani, Muhamad Syamsul Taufik, Aji Mulyana	Based on the results and discussions outlined above, the conclusions from the training on implementing VR as a technology-based learning medium for English language teaching to enhance pedagogical competence of teachers are as follows: 1. The training activities proceeded smoothly according to the planned targets. 2. The knowledge of elementary school English teachers in the Cipanas district regarding TPACK, particularly the implementation of VR technology in English language teaching, has broadened. As a result, teachers are better equipped to develop their pedagogical competencies optimally. 3. English teachers who teach at elementary schools in the

		Cipanas district found this training activity to be highly beneficial.
Systematic Literature Review: Utilization of Virtual Reality (VR) as an Alternative Learning Medium	Azilla Auri Pramesti, Nofa Sopiya, Richard Panigor Sitompul, Fitroh	In this article, virtual reality technology is predominantly used in the field of biology education. This is because biology requires more complex visualization models, allowing students to perceive learning concepts more vividly beyond textbooks or explanations provided solely by instructors. Due to the nature of the review and selection process, this study has certain limitations. We restricted our search to articles published between 2016 and 2022, assuming that during this timeframe, VR technology had been widely adopted as an alternative learning medium in the education sector. The article does not delve into the challenges of VR usage, which other studies have reported, including difficulties faced by

		students in operating VR systems, limited access to VR in some educational institutions, and health-related issues (such as dizziness, nausea, and eye strain). For future research, expanding the scope to explore barriers in VR adoption within the education field without restricting the search based on publication years would allow for a more comprehensive discussion.
Utilization of Virtual Reality (VR) Technology in Libraries	Muhammad Jamil	Libraries utilize virtual reality in various forms, such as using VR equipment for library tours, innovating library services—especially reference services—by introducing directional reference models, enriching information literacy materials in formats accessible through virtual reality devices, and creating 3D visualizations of online catalogs. VR technology will illuminate new ideas and inspire other librarians to consider, utilize, develop, and disseminate

		innovative solutions for reshaping library services, making them more responsive, agile, and effective.
The Effectiveness of Using Virtual Reality (VR) Learning Media in Trigonometry Topics on High School Students' Motivation and Mathematics Learning Outcomes	Annajmuts Tsaaqib, Achmad Buchori, Dhian Endahwuri	There is a difference in student learning outcomes between the experimental class that uses virtual reality learning media and the control class that employs conventional teaching methods. This is evidenced by the higher average learning motivation of students in the experimental class compared to the motivation of students in the control class. The use of virtual reality learning media is more effective than conventional methods, especially in trigonometry topics

In the field of education, various subjects are taught, and one of them is school-based learning aimed at enhancing students' scientific thinking. Throughout the learning process, many students face difficulties. As facilitators, teachers naturally engage with digital technology developments. Indeed, digital technology can serve as an alternative for more interactive and enjoyable learning experiences. Additionally, the choice of teaching models, learning methods, appropriate strategies, and interactive media significantly influences the learning process for students. Visualization technology, particularly virtual reality (VR), has progressed over time. VR can be a groundbreaking tool in teaching and learning activities, making it easier to model real or abstract environments in three dimensions. From several research studies, the

integration of technology in education has garnered significant attention, with Virtual Reality (VR) emerging as a promising tool to transform the learning experience. VR technology offers an immersive and interactive environment that enhances student engagement, motivation, and understanding of complex concepts.

4. CONCLUSION

Learning Media serves as a tool that teachers can utilize to enhance students' understanding of subject matter. By incorporating learning media, educators aim to motivate students and foster curiosity about the material they will receive, ultimately achieving the learning objectives. Digital media, including images, videos, and interactive games, is widely used as it encourages student motivation and curiosity. Several key competencies that teachers should focus on and develop include communication skills, conceptual understanding, addressing learning difficulties, fostering independence, and nurturing students' interests. When applied to specific subjects, Virtual Reality (VR) has been shown to significantly enhance student interest. Beyond stimulating interest, VR can also improve student engagement, motivation, comprehension of complex concepts, problem-solving skills, and self-confidence.

REFERENCE

The compilation of references that follow standard techniques must be done in a standard and consistent manner. To maintain consistency in the way of referencing, citation and bibliography, it is better to use the Reference Manager application, such as Zotero, Mendeley, or other paid applications. References use the IEEE Style rules. References are written in TNR 10, single spaced, with 1 space between references. Some examples of how to write references are given as follows.

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