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The Use of Virtual Reality (VR) as a Learning Media to Improve the Virtual Tour Experience in the Sharia Tourism Study Programme

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Abstract

Various findings and utilisation of virtual reality (VR) technology are clear evidence of the existence of technology as a digital era learning media. However, the use of VR in the world of tourism is considered irrelevant because tourism must be a direct visit. This research aims to improve the virtual tour experience in sharia tourism study programme students using VR. This is based on cost efficiency, time constraints, permits, security and others if the tour is a direct visit. To obtain data, qualitative research with descriptive study methods is used. Various phenomena in the field will be collected through interviews, observations, and documentation studies. Finally, the data is analysed using data reduction, data display, and conclusion drawing, and tested for validity through data triangulation. This research shows that VR in tourism has a significant positive impact, especially in the context of education and enhancing the virtual tour experience and preparing students to face the demands of the modern tourism industry in the era of society 5.0, as well as supporting the steps of study programmes and faculties in adopting the latest educational technology as well as a reference for lecturers for technological developments relevant to study programmes, especially the Sharia Tourism Study Program.

Keywords: *Digital Age, Online Tourist Visit, Learning Media, Virtual Reality.*

PRELIMINARY

The development of increasingly advanced technology has a significant impact in various fields, one of which is in the world of education. Teaching and learning activities are very important so that every teacher / lecturer in the education unit is expected to be able to create a fun and interactive learning process, this is in accordance with government regulation number 32 of 2013 concerning national education standards, written in article 19 that the learning process in education units can be interactive, inspiring, fun, challenging, and can motivate students to actively participate and provide sufficient space for initiative, creativity, and independence in accordance with the talents, interests, and physical and psychological development of students.

This should certainly be a concern for educators/lecturers, to be able to provide an interesting learning experience for students by utilising current technology and interactive media such as virtual reality (VR), augmented reality (AR), quizzes, educational games, videos, online learning platforms, and others, so that the delivery of material becomes fun and meets the various learning styles of students at this time (Xie & Yang, 2024; Zhuang, 2021; Mills & Brown, 2022; Mayer, et.al., 2023). Of course, this activity increases the professionalism of lecturers, and overcomes existing challenges (Darojat, et.al., 2022; Asikin, et.al., 2019; Hendrayana, et.al., 2022). Lecturers are required to be able to have innovations and ideas to make the learning process work as referred to in the government regulations on the national standards of education, this is also in accordance with the opinion of Mansur & Rafiudin (2020) which states that the learning process will not run optimally without the support of all elements of education, including learning media.

Cendekiawan: Jurnal Pendidikan dan Studi Keislaman
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Learning used to only use conventional methods and lecture methods and based on observations in the sharia Tourism study program there are still many lecturers who use the lecture method, even though it has been assisted by powerpoint but the visualisation displayed is still not interesting, this method should now begin to shift by using / utilising technology, this is certainly in line with the era of the industrial revolution 4.0 where many human activities can be replaced and controlled by technology (Bailenson, et.al., 2008; Lawson & Mayer, 2024; Liu, et.al., 2021; Jiang, et.al., 2024; Davani, 2022). One technology that can be adapted in the world of education is virtual reality technology (Mustika, et.al., 2015; Pramesti, et.al., 2022; Sumardani, et.al., 2019). VR is a technology that allows users to experience 3D visualisation and presents a 360-degree visual experience so that users can see in all directions as if they are really in the real world. According to the World Economic Forum (WEF) report published in October 2020 in Purnama, *et.al.* (2023) states that the need for VR technology in education is predicted to reach 70 per cent by 2025, this should be a concern for agencies to increase understanding of VR, namely by providing training to lecturers on how to use and understand VR devices.

Experiential learning is recognised as an effective approach in improving understanding, this is in accordance with Edgar Dale's Cone of Experience theory which explains that learning experiences can be obtained through a process from concrete to abstract, which means that the more users / students can gain direct experience (concrete), the information and experiences gained will also be more interesting and easy to remember such as simulations, doing the real thing will absorb as much as 90 per cent, and the use of VR technology falls into this category because users enter into a virtual environment that is very similar to direct experience, where VR not only stimulates vision but also hearing, even touch by using additional devices such as controllers and heptic gloves. Based on the Cone of Experience, learning using VR produces a much more maximum understanding than the convention method so far, such as seeing pictures and watching videos in the form of presentations displayed by lecturers on monitor screens with the help of infocus.

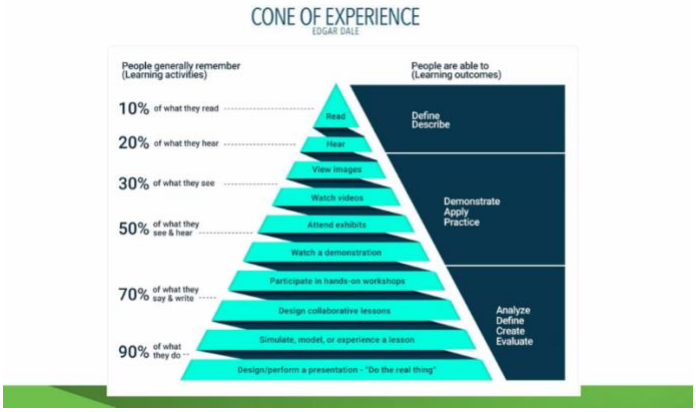

Figure 1. Cone of Experience

VR can be used as a learning medium that can increase student involvement in learning (Utami et al., 2021; Arsadhana, et.al., 2022; Pramono & Setiawan, 2019; Wardoyo, 2023), this is because students are able to explore the material displayed through VR simulations, in addition, the difficulty of visiting tourist attractions directly can be overcome by using VR where students can experience visiting tourist attractions such as beaches, mountains, museums, watching cultural performances using VR technology which is used as a tool and media for learning in Tourism (Sulistiani, et.al., 2023; Helmie, et.al., 2022; Dooley, et.al., 2020; Huang, et.al., 2024; Zhang, et.al., 2020).

Research by Sappaile, *et.al.* (2023), shows that VR has great potential to increase learning motivation, student engagement, and understanding of the material. This technology creates a realistic simulation environment that can be accessed through a special VR headset, providing an immersive visual, auditory, and kinesthetic experience, as well as increasing student concentration and learning motivation (Azim, 2024). The importance of implementing the use of VR technology in learning, especially in

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Tourism, has made researchers decide to implement the use of VR to improve the virtual tour experience to remote and inaccessible areas.

Previous studies have proven that VR is relevant to the context of digital era learning. The novelty of this research is taken from a case study on the sharia tourism study program at the Syaikh Abdurrahman Siddik State Islamic Institute of Bangka Belitung. Furthermore, this study also aims to reveal the urgency of using various educational technologies, so that they become a reference for the provision of similar facilities that have an impact on virtual learning for students. Furthermore, it will be explained in the sub-topics of results and discussion. Through this research, it is hoped that students and lecturers can adopt technology as a learning medium in the digital era.

METHOD

This study uses a qualitative research method. This descriptive study aims to analyze the use of VR as a learning medium to improve the virtual tour experience for students in the Sharia Tourism study program, Syaikh Abdurrahman Siddik State Islamic Institute, Bangka Belitung. Data collection techniques come from observation, interviews, questionnaires and documentation. Direct observation activities were carried out on research subjects who were Sharia Tourism students in semesters I (one), III (three), and V (five) totaling 20 people, then interviews were conducted with the main data sources, namely students and lecturers because both are subjects directly involved in learning. , questionnaires were also distributed to all students in the sharia tourism study program after they used virtual reality in the learning process, this was intended to see and analyze the experience of using VR, the obstacles faced and their suggestions and input in the future in learning activities in the sharia tourism study program, In addition, documentation in the form of videos and photos of learning activities using VR to support data from the results of interviews and observations of learning activities.

The conceptual framework of this research is shown in the scheme below:

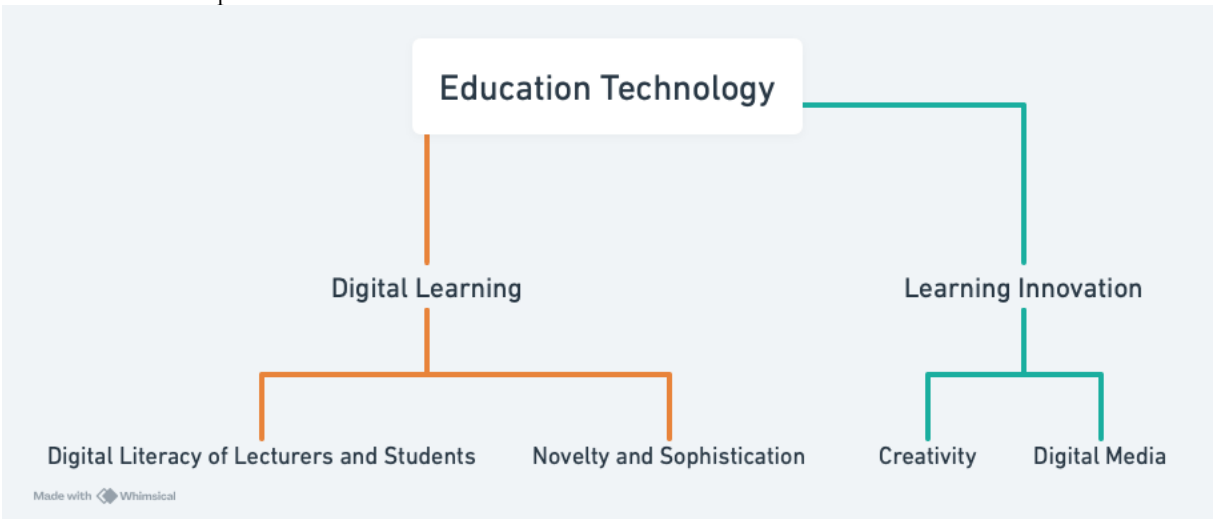

Figure 2. Framework (this study)

FINDINGS AND DISCUSSION

The Use of VR as a Learning Medium in the Sharia Tourism Study Program

Learning experience is very important for both lecturers and students, interesting learning activities will certainly create a pleasant classroom atmosphere, and will increase student motivation in learning which will ultimately produce satisfactory grades. Currently, there are many media that can be used in teaching and learning activities, so that lecturers no longer need to use conventional methods in the form of lectures and one-way presentations. Learning media is anything that can be used to channel messages from sender to recipient so as to stimulate the thoughts, feelings, attention and interests, and the willingness of students in such a way that the learning process occurs in order to achieve effective learning goals (Mustaqim, *et.al.,* 2017). Currently, generation Z prefers learning process activities that involve them directly and even more actively, because if they only explain and explain, students can get it through

Cendekiawan: Jurnal Pendidikan dan Studi Keislaman
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platforms that are widely available on their smartphones. VR technology is one of the media that can be used as a learning medium, especially in the Tourism study program. Tourism is very identical to travel activities, but of course agencies cannot continue to carry out travel activities even though the study program taught focuses on tourism, this is due to high costs, time, agency regulations, permits, security and others. Therefore, researchers took the initiative to try using Virtual Reality in the Sharia Tourism study program, while introducing new technology in the campus environment, from the results of the questionnaire the following results were obtained

Figure 3. Diagram of knowledge levels about Virtual Reality

That 68.4% of students have never heard of VR technology at all, this is certainly due to the lack of education and information about VR which is not yet widespread, so that many do not understand its benefits and uses,

Figure 4. VR usage experience diagram

From the distributed questionnaire, it was found that all students of the Sharia Tourism study program had never used VR and the learning was their first experience using VR, so they were very enthusiastic and excited to attend class to participate in learning activities. In addition, learning with virtual reality makes students more active and interactive because they are involved in the learning process so that they find it easier to understand the material and concepts taught, this is in accordance with the results of the questionnaire filled out by students of the Sharia Tourism study program as follows:

Cendekiawan: Jurnal Pendidikan dan Studi Keislaman
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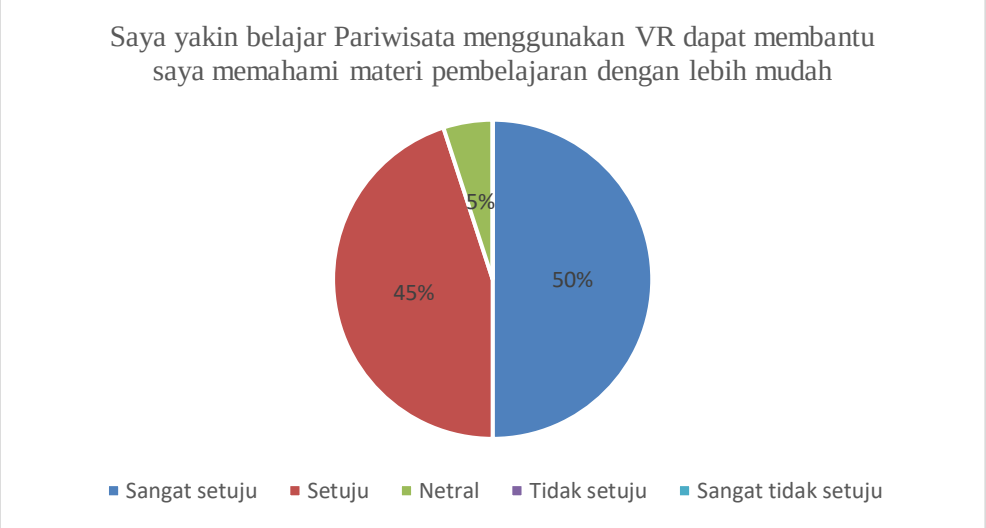

Figure 5. Level of Student Agreement on the Use of VR to Improve Understanding of Material

From the diagram above, it can be seen that 50 percent of students strongly agree that studying Tourism using Virtual Reality helps them understand the learning material more easily, and 45 percent of students agree with this, and the other 5 percent answered neutrally, and there were no answers disagreeing and strongly disagreeing with the questions/statements in this questionnaire. In addition, from the questionnaire distributed, the researcher also obtained results that at the time of the study, the researcher realized that the use of VR technology has advantages and disadvantages, but this may differ depending on the readiness of each institution for the VR technology.

The advantages of VR as a learning medium in the Sharia Tourism study program are first, a more immersive learning experience. Students can feel directly and have a deeper experience so that understanding the material is also easier. According to Sundari (2024) the implementation of technologies such as AI, VR, and AR can create a deeper and contextual learning experience, allowing students. Second, develop critical skills that are relevant to the demands of today's digital era. Third, students can take virtual tours to various regions and destinations that are difficult to visit, not only in Indonesia but in various parts of the world depending on the content available on YouTube, in other words, exploring the world without limits, so that students can visit natural, cultural, and artificial attractions such as beaches, museums, and can do snorkeling, hiking, diving and even perform Umrah to Mecca. Fourth, cost and time efficiency. Traveling with a virtual tour can be done without spending money such as tickets, accommodation, and consumption and does not require tiring physical travel where it can be done briefly and flexibly regarding time and place so that it can be done anywhere and anytime. Fifth, the use of VR increases student participation in class both in terms of attendance and activeness. Sixth, introducing and preparing students to face the demands of the modern tourism industry that uses technology in the future.

In addition to the advantages, of course VR also has several disadvantages that were felt during this research, namely first, the content used is still limited from YouTube because creating your own content requires expert HR competencies and quite large funds, so that at this time lecturers can adjust to the existing content and integrate it into the semester learning plan (RPS). Second, some students experience motion sickness, such as nausea and dizziness after using VR, this is because everyone has a different level of tolerance for sensory conflict and new users are more vulnerable because they are not used to it. Third, it is very dependent on internet connection, so the quality of the internet/wifi must be good and smooth so that the movement of the video is also in accordance with the movement of the user's head and this is also to reduce the effects of motion sickness in the use of VR. Fourth, the development of VR usage and its application in institutions requires quite high costs because it must provide VR equipment, create VR content according to the field, and other devices as well as provide adequate classroom facilities. This is in accordance with (Azmi, et al., 2023) that developing realistic VR simulations requires significant resources, such as a development team consisting of material experts,

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instructional designers, programmers, and 3D artists as well as high-spec computer devices. Fifth, lecturers in the Sharia Tourism study program and even the Faculty of Sharia and Islamic Economics at IAIN Syaikh Abdurrahman Siddik Bangka Belitung have never used VR so they still have to learn and support from institutions is needed in the form of extensive training and learning.

Use of VR Enhances Students' Virtual Tour Experience

From the interview and questionnaire results, it was found that most of the students had never heard of Virtual Reality technology and in the learning process it was the first experience for all students and lecturers using virtual reality (VR), they were very enthusiastic and excited when simulating the use of VR. The VR used is a VR with standard quality equipped with a headset, and the use of VR is quite easy where it only requires VR equipment and a smartphone which at this time every student must have, and for the material used the researcher took it from YouTube content that provides videos that support VR or 360 ° and adjust it to the material to be studied.

Furthermore, in this case the researcher used Bali destination content uploaded from the account of the Indonesian Ministry of Tourism and Creative Economy (Kemenparekraf) after that activate VR Mode by clicking the VR icon, namely the image of glasses in the lower right corner of the screen and then the display will change into two parts that are suitable for VR devices. After that, insert the smartphone into the VR and make sure the smartphone is installed properly and comfortably and plug the VR headset cable into the smartphone for better sound quality and wear the VR headset and adjust the lens with the eye distance as needed and the user can start enjoying the virtual tour experience as if in the real world using VR technology.

Figure 6. Virtual Reality application interface display with 360o video on Youtube
(Source: Youtube Kemenparekraf)

The use of virtual reality is very enjoyable because it can help overcome the limitations of accessibility, distance, cost and time for learning activities, especially in tourism. When using VR for the first time, researchers adjusted the VR learning material with the concept of a tourist trip consisting of three elements, namely Something to see, something to do, and something to buy, so that the content used is Explore Bali in One Day on the @Kemenparekraf youtube account, students enjoy a virtual tour to Bali by visiting several tourist attractions, namely Lake Tamblingan, Tanjung Benua Beach and Uluwatu Temple, at Lake Tamblingan users are invited to go around the lake using a jukum, namely a boat where users can see the clear water of the lake and the scenery around the lake, then the second location is Tanjung Benua Beach, users are invited to enjoy the beach and do snorkeling activities by seeing the amazing underwater scenery with lots of fish and clear sea water, and this is a favorite spot for students when doing a virtual tour using VR.

Next, the last tourist attraction visited is Uluwatu Temple, users are invited to go around the temple and if users can explore well, users can see monkeys in this video. This YouTube video is 7 minutes 3 seconds long, and for novice users it is recommended that the duration of time used should not be too long, because during the implementation the researcher found that there were 2 (two) people who experienced motion sickness in the form of dizziness, this can happen because of sudden spinning movements or being too enthusiastic about exploring so that there is a signal conflict where the brain receives two different signals, the eyes see realistic movements in the virtual world but the body remains still so that the visual and vestibular signals cause the brain to become confused and trigger symptoms of motion sickness. The virtual tour experience provides an interesting experience, students can learn while having fun and exploring the world without limits.

CONCLUSION

This study shows that the use of VR as a learning medium is an effective innovation in improving the quality and attractiveness of learning in the Sharia Tourism study program and is able to improve the virtual tour experience by presenting immersive simulations, where students can explore tourism destinations virtually and more interactive learning, this can be done by integrating the use of VR technology into the semester learning plan (RPS) so that students are expected to be able to understand sharia tourism material more realistically and contextually, improve competence, and prepare students to face the demands of the modern tourism industry that uses technology. This initiative also supports the steps of study programs and faculties in adopting the latest educational technology, while bringing students closer to technological developments that are relevant to their fields of study, especially the Sharia Tourism Study Program, but to achieve more effective benefits from using VR as a learning medium, of course, investment is needed in the provision of VR technology by the campus, then training for lecturers to be able to use and apply VR as a learning medium and continuous research on VR technology.

REFERENCES

Arsadhana, I. W. A. S., Dewi, N. K. R. S., & Putri, N. K. J. K. (2022). Aplikasi pembelajaran berbasis virtual reality sebagai inovasi pendidikan berkelanjutan di era society 5.0. *Prosiding Pekan Ilmiah Pelajar (PILAR)*, *2*, 736-740. https://e-journal.unmas.ac.id/index.php/pilar/article/view/4518.

Asikin, N., Nevrita, N., & Alpindo, O. (2019). Pelatihan pemanfaatan media pembelajaran berbasis virtual reality untuk guru-guru IPA kota Tanjungpinang. *Jurnal Anugerah*, *1*(2), 71-76. https://ojs.umrah.ac.id/index.php/anugerah/article/view/1606.

Azmi, M. N., Mansur, H., & Utama, A. H. (2024). Potensi Pemanfaatan Virtual Reality Sebagai Media Pembelajaran di Era Digital. *Jurnal Dimensi Pendidikan Dan Pembelajaran*, *12*(1), 211-226. https://litabmas.umpo.ac.id/index.php/dimensi/article/view/9746/0.

Bailenson, J., Patel, K., Nielsen, A., Bajscy, R., Jung, S. H., & Kurillo, G. (2008). The Effect of Interactivity on Learning Physical Actions in Virtual Reality. *Media Psychology*, *11*(3), 354–376. https://doi.org/10.1080/15213260802285214.

Cone of Experience Edgar Dale diambil dari : https://uqualio.com/post/the-true-purpose-of-the-cone-of-experience.

Darojat, M. A., Ulfa, S., & Wedi, A. (2022). Pengembangan virtual reality sebagai media pembelajaran sistem tata surya. *Jurnal Kajian Teknologi Pendidikan*, *5*(1), 91-99. https://www.neliti.com/publications/433112/pengembangan-virtual-reality-sebagai-media-pembelajaran-sistem-tata-surya.

Davani, D. (2022). Analisis Dampak Penggunaan Gadget pada Siswa dalam Pembelajaran di Sekolah. *Cendekiawan: Jurnal Pendidikan dan Studi Keislaman*, *1*(2), 87-91. https://www.zia-research.com/index.php/cendekiawan/article/view/51.

Dooley, K., Bender, S., Ferris, G., Frankham, B., Munt, A., & Schleser, M. (2020). Immersive media practices in the classroom: models of the teaching research nexus in an Australian context. *Media Practice and Education*, *21*(4), 241–260. https://doi.org/10.1080/25741136.2020.1832829.

Helmie, J., Nurviyani, V., Ristiani, I., Taufik, M. S., & Mulyana, A. (2022). Pelatihan Implementasi Virtual Reality (VR) Sebagai Media Pembelajaran Berbasis Digital Untuk Mengembangkan Kompetensi

Pedagogik Guru-Guru Sd Di Kec. Cipanas. *Jurnal Warta Desa (JWD)*, *4*(1), 34-40. http://jwd.unram.ac.id/index.php/jwd/article/view/170.

Hendrayana, D., Rahmah, N. A., Ariatama, A., & Tobing, S. H. L. (2022). Studi literatur: Pemanfaatan virtual reality sebagai media pembelajaran dan uji kompetensi untuk industri perfilman. *Jurnal Seni Nasional Cikini*, *8*(2), 71-78. https://jurnalcikini.ikj.ac.id/index.php/jurnalcikini/article/view/158.

Huang, A., de la Mora Velasco, E., & Haney, A. (2022). Examining Instructional Technologies in Hospitality and Tourism Education: A Systematic Review of Literature. *Journal of Hospitality & Tourism Education*, *36*(2), 113–131. https://doi.org/10.1080/10963758.2022.2109480.

Jiang, Y. P., Su, C., & Li, X. C. (2024). Virtual Reality Technology for the Digital Dissemination of Traditional Chinese Opera Culture. *International Journal of Human–Computer Interaction*, 1–15. https://doi.org/10.1080/10447318.2024.2327180.

Kemenparekraf. "Tour Virtual Bali 360" diunggah oleh Kemenparekraf, 21 November 2020, https://youtu.be/LT4jKNyR0J8?si=x0Bb1p1dqid_NI3R. Diakses pada 21 Oktober 2024.

Lawson, A. P., & Mayer, R. E. (2024). Effect of Pre-Training and Role of Working Memory Characteristics in Learning with Immersive Virtual Reality. *International Journal of Human–Computer Interaction*, 1–18. https://doi.org/10.1080/10447318.2024.2325176.

Liu, Q., Tang, Q., & Wang, Y. (2021). The effects of pretraining intervention in immersive embodied virtual reality cardiopulmonary resuscitation training. *Behaviour & Information Technology*, *40*(12), 1265–1277. https://doi.org/10.1080/0144929X.2021.1960606.

Mansur, H., & Rafiudin, R. (2020). Pengembangan media pembelajaran infografis untuk meningkatkan minat belajar mahasiswa. *Jurnal Komunikasi Pendidikan*, *4*(1), 37-48. http://journal.univetbantara.ac.id/index.php/komdik/article/view/443.

Mayer, R. E., Makransky, G., & Parong, J. (2022). The Promise and Pitfalls of Learning in Immersive Virtual Reality. *International Journal of Human–Computer Interaction*, *39*(11), 2229–2238. https://doi.org/10.1080/10447318.2022.2108563.

Mills, K. A., & Brown, A. (2021). Immersive virtual reality (VR) for digital media making: transmediation is key. *Learning, Media and Technology*, *47*(2), 179–200. https://doi.org/10.1080/17439884.2021.1952428.

Mustaqim, I. (2017). Pengembangan media pembelajaran berbasis augmented reality. *Jurnal Edukasi Elektro*, *1*(1). https://journal.uny.ac.id/index.php/jee/article/view/13267.

Mustika, M., Rampengan, C. G., Sanjaya, R., & Sofyan, S. (2015). Implementasi augmented reality sebagai media pembelajaran interaktif. *Creative Information Technology Journal*, *2*(4), 277-291. http://citec.amikom.ac.id/main/index.php/citec/article/view/55.

Pramesti, A. A., Sitompul, R. P., & Sopiya, N. (2022). Systematic Literature Review: Pemanfaatan Virtual Reality (Vr) Sebagai Alternatif Media Pembelajaran. *Jurnal Pendidikan Teknologi dan Kejuruan*, *19*(2), 105-117.

Pramono, A., & Setiawan, M. D. (2019). Pemanfaatan augmented reality sebagai media pembelajaran pengenalan buah-buahan. *INTENSIF: Jurnal Ilmiah Penelitian Dan Penerapan Teknologi Sistem Informasi*, *3*(1), 54-68. https://ojs.unpkediri.ac.id/index.php/intensif/article/view/12573.

Purnama, I., & Pranoto, N. W. (2023). Virtual Reality for Future Education: Systematic Literature Review. *Jurnal Penelitian Pendidikan IPA*, *9*(7), 322-327. https://jppipa.unram.ac.id/index.php/jppipa/article/view/4485.

Sappaile, B. I., Ahmad, Z., Hita, I. P. A. D., Razali, G., Dewi, R. D. L. P., & Punggeti, R. N. (2023). Model Pembelajaran Kooperatif: Apakah efektif untuk meningkatkan motivasi belajar peserta didik?. *Journal On Education*, *6*(1), 6261-6269. https://jonedu.org/index.php/joe/article/view/3830.

Sulistiani, H., Isnain, A. R., Rahmanto, Y., Saputra, V. H., Lovika, P., Febriansyah, R., & Chandra, A. (2023). Workshop Teknologi Metaverse Sebagai Media Pembelajaran. *Journal of Social Sciences and Technology for Community Service (JSSTCS)*, *4*(1), 74-79. https://ejurnal.teknokrat.ac.id/index.php/JSSTCS/article/view/2642.

Sumardani, D., Midaraeni, I., & Sumardani, N. I. (2019, February). Virtual reality sebagai media pembelajaran relativitas khusus berbasis google cardboard pada smartphone android. In *Prosiding Seminar Nasional Pendidikan KALUNI* (Vol. 2). https://rumahpublikasi.com/index.php/prokaluni/article/view/80.

Sundari, E. (2024). Transformasi Pembelajaran Di Era Digital: Mengintegrasikan Teknologi Dalam Pendidikan Modern. *Sindoro: Cendikia Pendidikan*, *4*(5), 25-35. https://ejournal.warunayama.org/index.php/sindorocendikiapendidikan/article/view/3325.

Utami, L. P. R. A., Suwastini, N. K. A., Dantes, G. R., Suprihatin, C. T., & Adnyani, K. E. K. (2021). Virtual reality for supporting authentic learning in 21st century language classroom. *Jurnal Pendidikan Teknologi dan Kejuruan*, *18*(1), 132-141. https://www.researchgate.net/profile/Luh-Utami/publication/349674339_VIRTUAL_REALITY_FOR_SUPPORTING_AUTHENTIC_LEARNING_IN_21ST_CENTURY_LANGUAGE_CLASSROOM/links/603c6532299bf1cc26fbd365/VIRTUAL-REALITY-FOR-SUPPORTING-AUTHENTIC-LEARNING-IN-21ST-CENTURY-LANGUAGE-CLASSROOM.pdf?_sg%5B0%5D=started_experiment_milestone&origin=journalDetail.

Xie, T., & Yang, Y. (2024). Use of immersive virtual reality in environmental education: effects on environmental empathy, skill transfer, and attitudes. *Interactive Learning Environments*, 1–15. https://doi.org/10.1080/10494820.2024.2436947.

Wardoyo, R. (2023). VIRTUAL REALITY SEBAGAI MEDIA PEMBELAJARAN JARINGAN KOMPUTER. *JURNAL TEKNOLOGI INFORMASI DAN KOMUNIKASI*, *14*(2), 248-254. https://ejurnal.provisi.ac.id/index.php/JTIKP/article/view/586.

Zhang, H., Yu, L., Ji, M., Cui, Y., Liu, D., Li, Y., … Wang, Y. (2020). Investigating high school students' perceptions and presences under VR learning environment. *Interactive Learning Environments*, *28*(5), 635–655. https://doi.org/10.1080/10494820.2019.1709211.

Zhuang, Z. (2021). Interactive Media Information Security Immersive Experience System Based on Virtual Reality Technology. *IETE Journal of Research*, 1–8. https://doi.org/10.1080/03772063.2021.1965045.