



Integration of Islamic Religious Learning With Virtual Reality And Augmented Reality in E-Learning: Analysis of Opportunities And Challenges in The Technology Era

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Kata Kunci: <i>Islamic Religious Education; Virtual Reality (VR); Augmented Reality (AR); Interactive E-learning; Digital Learning Transformation.</i>	ABSTRAK <i>Penelitian ini mengeksplorasi integrasi Virtual Reality (VR) dan Augmented Reality (AR) dalam Pendidikan Agama Islam (PAI) melalui platform e-learning, dengan fokus pada peluang, tantangan, dan strategi implementasi yang efektif. Tujuan penelitian ini adalah untuk menilai bagaimana teknologi VR dan AR dapat meningkatkan keterlibatan, motivasi, dan pemahaman siswa terhadap konsep-konsep abstrak dalam Islam, seperti sejarah Islam, ritual ibadah, dan tempat-tempat suci, dengan menyediakan pengalaman belajar yang interaktif dan mendalam. kualitatif deskriptif dengan metode studi kepustakaan, penelitian ini menganalisis literatur yang ada tentang penggunaan VR dan AR dalam pendidikan, khususnya dalam studi agama, dan mengevaluasi potensi teknologi ini untuk mengatasi keterbatasan metode pembelajaran tradisional. Temuan penelitian menunjukkan bahwa VR dan AR menawarkan peluang untuk memvisualisasikan konten keagamaan yang kompleks, yang dapat meningkatkan keterlibatan dan pemahaman siswa. Namun, penelitian ini juga mengidentifikasi beberapa tantangan, seperti Keterbatasan infrastruktur, kesiapan pendidik, dan dukungan institusional. Penelitian ini merekomendasikan kemitraan strategis dengan penyedia teknologi untuk mengurangi biaya, penggunaan infrastruktur berbasis cloud untuk meningkatkan aksesibilitas, dan pengembangan profesional berkelanjutan bagi pendidik untuk memastikan penggunaan teknologi ini secara efektif. Dengan dukungan dan strategi yang tepat, VR dan AR dapat mengubah pendidikan agama Islam, menjadikannya lebih interaktif, terjangkau, dan sesuai secara digital.</i>
	ABSTRACT <i>This research explores the integration of Virtual Reality (VR) and Augmented Reality (AR) in Islamic Religious Education (PAI) through an e-learning platform, focusing on opportunities, challenges, and effective implementation strategies. The purpose of this study is to assess how VR and AR technologies can enhance students' engagement, motivation, and understanding of abstract concepts in Islam, such as Islamic history, worship rituals, and holy sites, by providing an interactive and immersive learning experience. Using qualitative library research methods, this study analyzes existing literature on the use of VR and AR in education, particularly in religious studies, and evaluates the potential of these technologies to overcome the limitations of traditional learning methods. The study findings indicate that VR and AR offer significant opportunities for visualizing complex religious content, which can enhance student engagement and understanding. However, the study also identifies several</i>

challenges, such as high costs, limited access to necessary technology, and lack of training for educators. The study recommends strategic partnerships with technology providers to reduce costs, the use of cloud-based infrastructure to increase accessibility, and ongoing professional development for educators to ensure the effective use of these technologies. With the right support and strategies, VR and AR can transform Islamic religious education, making it more interactive, affordable, and digitally appropriate.



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INTRODUCTION

The development of information and communication technology has brought significant changes to the world of education, including in the field of Islamic religious studies. One of the most striking forms of transformation is the use of digital technology to support learning, particularly with the emergence of e-learning as an increasingly popular alternative to blended/hybrid learning and online learning. The technology integrated into e-learning is no longer limited to instructional videos or text modules, but has now evolved to include advanced technologies such as Virtual Reality (VR) or Augmented Reality (AR). These technologies offer a more immersive and interactive learning experience, believed to enhance student understanding and engagement, particularly in the context of Islamic religious studies.

Virtual Reality (VR) and Augmented Reality (AR) are two technologies with significant potential to support the Islamic religious learning process. VR, which allows users to immerse themselves in a fully computerized three-dimensional environment, offers a new way to convey religious material such as Islamic historical stories, historical sites like Mecca and Medina, and understanding worship rituals. Meanwhile, AR integrates digital elements with the real world, allowing learners to interact with objects or information that appear on their screens directly, creating a more immersive learning experience¹.

Traditional Islamic religious education (PAI) relies heavily on lectures, verbal explanations, and textual references. These methods can sometimes be less engaging for modern learners accustomed to visual and interactive media. This situation impacts learning motivation and understanding of abstract Islamic concepts, such as Islamic history. This immersive technology promises a paradigm shift in learning from the consumption of material to a more immersive, interactive, and contextual learning experience². The integration of VR and AR in Islamic religious education opens new horizons for understanding Islamic concepts more vividly.

Previous research has shown that the use of technology in education can improve the quality of learning and student motivation. For example, research by Wahyuni revealed that integrating VR into education can enhance interaction between students and learning materials, making the learning process more engaging and effective. In the context of Islamic religious learning, the use of VR and AR can also facilitate the

¹ Moh Elman, "Inovasi Pembelajaran Pendidikan Agama Islam Berbasis Metaverse," *Dirosat: Journal of Islamic Studies* 9, no. 1 (2024).

² Fekra Mustafa et al., "The Practice of Augmented Reality in Islamic Education and the Level of Motivation Among UAE Secondary School Students," *Social Sciences* 2025, Vol. 14, Page 80 14, no. 2 (January 31, 2025): 80, <https://doi.org/10.3390/SOCSCI14020080>.

understanding of abstract concepts that may be difficult to grasp through traditional methods, such as explanations of the spiritual dimension or Islamic historical narratives involving various locations and times³. This study aims to explore the opportunities and challenges faced in integrating VR and AR into Islamic religious learning on e-learning platforms, as well as analyze their impact on learning quality.

Despite these significant opportunities, educators and e-learning developers face several challenges. One is the need for sufficiently sophisticated hardware and software to run VR and AR applications. Accessibility to these devices is a significant barrier, especially in countries with limited resources. Furthermore, another challenge is designing learning materials that are suited to the characteristics of VR and AR technology, which requires a more creative and interactive learning design approach. In this context, research by Sudiro and Munjin shows that despite the numerous potential benefits of these technologies, adapting to changing learning methods is a crucial factor in determining their effectiveness. Therefore, it is crucial to consider various technical and pedagogical aspects when designing VR and AR-based e-learning for Islamic religious learning⁴.

The significance of this research lies in assessing the extent to which VR and AR technologies can be successfully integrated into Islamic religious learning. By analyzing the opportunities and challenges, it is hoped that practical solutions can be found that can optimize the implementation of these technologies and provide insights for developing curricula and teaching methods that are relevant to current developments. This research focuses not only on the potential of technology but also on its impact on a deeper understanding of Islam based on the values contained in the Quran and Hadith.

Overall, this introduction provides an overview of the importance of integrating VR and AR technology into Islamic religious learning in the technological era and identifies various factors influencing its success. This research is expected to make a significant contribution to the development of more innovative Islamic religious learning that is in line with the demands of technological developments in the 21st century.

METHOD

This study uses a qualitative approach with library research. This approach was chosen to conceptually examine the integration of Virtual Reality (VR) and Augmented Reality (AR) technology in Islamic Religious Education (PAI) learning. Data sources consist of secondary data, obtained from scientific journals, books, and other relevant literature discussing the use of technology in religious education, the application of VR/AR in e-learning in the context of digital learning⁵. Data collection techniques were carried out by searching and reviewing articles, journals, and research reports that discuss the challenges, opportunities, and implementation of VR and AR technology in religious learning, especially in improving the quality and engagement of students in the digital era. The data obtained were then analyzed thematically to identify trends, strategies, and potential successes and obstacles in integrating this technology into PAI

³ Fitri Wahyuni and Dian Syah Rani, "Utilization of Augmented Reality (AR) as an Innovative Interactive Learning Media In Islamic Religious Education (IRE)," *Proceeding International Seminar of Islamic Studies* 6, no. 1 (March 24, 2025): 399–406, <https://doi.org/10.3059/INSIS.V0I0.22807>.

⁴ Sudiro Sudiro and Munjin Munjin, "Teaching Management of Islamic Religion Education Based on Virtual Reality at Junior High School," *AL-ISHLAH: Jurnal Pendidikan* 16, no. 4 (December 12, 2024): 4599–4612, <https://doi.org/10.35445/ALISHLAH.V16I4.6183>.

⁵ M Fadli, "Memahami Desain Metode Penelitian Kualitatif," *Humanika: Kajian Ilmiah Mata Kuliah Umum* 21, no. 1 (2021): 35–54.

learning, as well as to provide applicable recommendations for educators and curriculum developers.

RESULT AND DISCUSSION

Opportunities for Integrating VR and AR Technology in Islamic Religious Learning

In the era of globalization and Society 5.0, the use of technology is no longer limited to tools but has become an integral part of the learning process, creating a more immersive, interactive, and contextual learning experience. Virtual Reality (VR) and Augmented Reality (AR) are two forms of future immersive technology that have significant potential to transform the way students learn educational materials, including in the field of Islamic Religious Education (PAI). The opportunity for integrating VR and AR in PAI lies in the technology's ability to overcome the limitations of conventional learning methods, which are often monotonous and unattractive for digital generation students.

Increased student engagement, also known as student engagement, is a key benefit and opportunity of VR and AR integration. VR technology offers an immersive learning experience by presenting a three-dimensional digital environment that mimics reality, enabling students to experience the learning process firsthand, rather than simply passively receiving information. Global studies show that integrating VR in education can increase student engagement with learning content through visually relevant interactions and simulations⁶. This strengthens students' cognitive and emotional engagement with the material being studied. This higher engagement effect has been identified in various studies related to the integration of AR and VR in general education (student engagement, motivation, performance)⁷.

For example, in Islamic religious education, VR allows students to experience spiritual journeys, such as simulating the Hajj pilgrimage or virtually exploring Islamic historical sites. The introduction of abstract concepts, such as the history of the Prophet or religious practices that have a spatial-temporal context, can be strengthened through immersive VR experiences that present visualizations of real-life situations, resulting in deeper and more memorable student understanding compared to lectures or reading alone⁸. This approach aligns with constructivist theory, which emphasizes that effective learning is learning that allows students to construct knowledge through direct experience.

Another opportunity emerging from the application of AR and VR in Islamic religious learning is the technology's ability to visualize abstract concepts that are difficult to explain through traditional media. AR allows students to view digital information superimposed directly on the real-world environment through devices such as smartphones, tablets, or smart glasses. For example, AR can be used to visualize prayer procedures, prayer times, or the structure of a mosque with additional visual elements

⁶ Qonita Alfiya Khoirunnisa and Muliatul Maghfiroh, "The Application of Augmented Reality (AR) Technology in Islamic Education Learning for Islamic History Material to Improve Student Learning Outcomes at SMPN 01 Pamekasan," *Al-Afkar, Journal For Islamic Studies* 9, no. 2 (April 10, 2026): 720–29, <https://doi.org/10.31943/AFKARJOURNAL.V9I2.3403>.

⁷ Abdullah M. Al-Ansi et al., "Analyzing Augmented Reality (AR) and Virtual Reality (VR) Recent Development in Education," *Social Sciences & Humanities Open* 8, no. 1 (January 1, 2023), <https://doi.org/10.1016/J.SSAHO.2023.100532>.

⁸ Faizan Hassan Javed and Muddassir Ahmad, "Integrating The Metaverse Into Quranic Studies (Innovations And Challenges)," *Zia e Tahqeeq* 15, no. 30 (December 30, 2025): 1–21, <https://ziaetahqeeq.gcuf.edu.pk/index.php/zgtcuf/article/view/85>.

that support students' intuitive understanding⁹. Thus, the use of AR shows that this medium can deepen students' understanding of complex concepts and improve information retention. This opens up significant opportunities for Islamic religious educators to integrate AR into learning materials that require visual representations or diagrams, such as Islamic history, religious laws, or social structures in Islamic society. AR can also accommodate various learning styles, especially for students who are more responsive to visualization and interaction than pure text.

Furthermore, the application of VR and AR in learning is not only about delivering more engaging content, but also opens up opportunities for implementing experiential learning, or experience-based learning. VR allows for the simulation of real-life learning situations that are difficult or impossible to present directly in a physical classroom, such as historical journeys, simulations of important Islamic events, or ritual practices without having to be in the actual location. These experiences can help students understand the connection between theory and real-life reality, which is one of the goals of Islamic religious learning: understanding teachings in a real-life context¹⁰.

Providing experiences, especially for students in remote areas or those with limited access to physical educational resources, this technology allows students from various regions to access an equal learning experience, as long as they have a device and an internet connection. This has the potential to bridge the gap in the quality of Islamic religious learning between urban and rural areas, which often still face limited learning facilities¹¹. For example, students in areas without access to traditional resources such as libraries or higher education institutions can still learn religious material immersively through VR and AR platforms.

Thus, this technology is not only an innovative tool but also a tool to expand access to quality Islamic religious education and enrich the learning experience by inserting contextually relevant, real-time information while students are in the real world. It's not just a technological trend, but a strategic opportunity to create more effective, efficient, and meaningful learning, in line with the demands of educational development in the digital age.

Challenges in Implementing VR and AR Technology in Islamic Religious Learning

The implementation of Virtual Reality (VR) and Augmented Reality (AR) technologies in Islamic religious education through e-learning has great potential to improve the quality of education, enrich the learning experience, and facilitate the understanding of abstract concepts that are sometimes difficult to grasp through conventional methods. However, while these technologies offer many benefits, the challenges associated with their implementation remain significant. These challenges include infrastructure, curriculum, and the readiness of educators themselves.

One of the main challenges is limited infrastructure in educational institutions. VR and AR technologies require sophisticated hardware, such as VR headsets, mobile devices for AR, and high-spec computers to run VR/AR-based learning applications. The cost of

⁹ Serani Dara Liestya, Isnaini Isnaini, and Ida Zahara Adibah, "Penggunaan Augmented Reality (AR) Dalam Pembelajaran Pendidikan Agama Islam Di SMA Negeri 2 Ungaran," *Jurnal Pendidikan Indonesia: Teori, Penelitian Dan Inovasi* 5, no. 2 (2025): 192–97, <https://doi.org/10.59818/jpi.v5i2.1444>.

¹⁰ Aziza Aryati et al., "Spiritual Pilgrimage Through Virtual Reality (VR): Transforming Islamic Religious Education in Madrasahs," *Ta'dib* 27, no. 2 (December 11, 2024): 435–45, <https://doi.org/10.31958/JT.V27I2.12350>.

¹¹ Sudiro and Munjin, "Teaching Management of Islamic Religion Education Based on Virtual Reality at Junior High School."

procuring these devices is often a major barrier for many educational institutions, especially those in resource-constrained regions. Research by Moses Agoi (2026) found that adequate infrastructure is key to implementing technology in education, and a lack of infrastructure can hinder the development of VR/AR technology, particularly in regions with economic inequality or limited digital access¹². Other research also adds to Shobri et al.'s (2025) findings that disparities in access to educational technology, including VR and AR, can exacerbate disparities in the quality of learning received by students across regions¹³. So without adequate devices and fast internet connections, VR and AR technology is difficult to implement effectively, infrastructure and cost challenges are major barriers to the adoption of this technology in many educational institutions, especially in schools with limited budgets and lack of access to technology.

Another challenge that needs to be considered is the readiness of educators, including technical competence to operate VR or AR devices, pedagogical competence in designing effective learning using this technology, and their perceptions of the use of technology in education.

The use of this technology requires a fairly in-depth understanding of the hardware (such as VR headsets, mobile devices for AR) and software used in learning. Research shows that many educators experience difficulties in operating new technologies, especially immersive technologies like VR and AR, which require specialized technical skills. Pramono (2026) in their study indicated that low technical competence is a major barrier to implementing VR technology in the classroom, considering that this technology requires considerable time and training to master effectively¹⁴. This suggests that to be able to utilize VR/AR technology optimally, educators need to be equipped with ongoing training regarding the use of these devices, so that they not only master how to operate them but also are able to overcome technical problems that may arise during the learning process.

However, technical competence alone is not enough. Educators must also possess adequate pedagogical competence to integrate VR and AR into the Islamic religious learning curriculum. This pedagogical competence includes the ability to design learning experiences that focus not only on technical aspects but also address the holistic objectives of Islamic religious learning. In this context, educators must be able to adapt the use of VR and AR to deepen students' understanding of complex religious concepts, such as Islamic history, worship practices, and Quranic interpretation. Nursafitri (2025) noted that educators often struggle to integrate technological aspects with pedagogical objectives in religious teaching, resulting in superficial teachings that miss the point¹⁵. Therefore, educators need to design learning activities that utilize VR/AR technology meaningfully and in accordance with the Islamic values they intend to teach, so that this technology serves not only as a visual aid but also can enrich a deeper understanding of

¹² Moses Adeolu Agoi et al., "Augmented Reality for Islamic Education: Enhancing Qur'an Learning in Nigeria," *Abdurrauf Journal of Education and Islamic Studies* 2, no. 2 (January 31, 2026): 49–59, <https://doi.org/10.70742/ARJEIS.V2I2.527>.

¹³ Khoirus Shobri et al., "Augmented and Virtual Reality in Indonesian Madrasah Education: Potentials, Challenges, and Future Directions," *GPH-International Journal of Educational Research*, 8, no. 7 (2025).

¹⁴ Hadi Pramono, "Integrasi Virtual Reality Dan Augmented Reality Dalam Transformasi Pembelajaran Abad Ke-21 : Tinjauan Literatur," *Netizen: Journal of Society and Bussiness* 2, no. 3 (2026): 298–303.

¹⁵ Laila Nursafitri, Arif Mahya Fanny, and Dwi Feriyanto, "Analisis Immersive Learning Sebagai Inovasi Pembelajaran Pendidikan Agama Islam (PAI) Di Sekolah Dasar," *Inventa : Jurnal Pendidikan Guru Sekolah Dasar* 8, no. 2 (2025), http://jurnal.unipasby.ac.id/index.php/jurnal_inventa.

religion. In line with research by Shobri (2025), one reason why this technology has not been optimal in Islamic religious education is the limitations of existing content, which often does not delve deeply enough into the religious values intended to be taught to students. Developing VR and AR-based content that aligns with Islamic values requires collaboration between religious experts and technology developers to ensure that the material presented is truly relevant and spiritually profound¹⁶.

Educators' perceptions and attitudes toward technology also play a significant role in their readiness to adopt VR and AR. Research shows that while many educators recognize the potential benefits of these technologies, many also hold negative attitudes toward them, primarily related to concerns about the technology's complexity, the high cost of some devices, and concerns about the loss of personal interaction essential to religious education. Husanah (2024) revealed that positive attitudes toward technology are strongly associated with a willingness to try and adopt new technologies, while negative attitudes are often rooted in fear and uncertainty about change¹⁷. Therefore, it is important for educational institutions to provide a supportive approach to help educators feel more comfortable and confident in using VR and AR technologies, including providing adequate training and resources to address these concerns.

The challenges in implementing VR and AR technology in Islamic religious learning are complex and multidimensional. Limited infrastructure, educator readiness, and institutional support and adequate training are some of the main obstacles that need to be addressed so that these technologies can be used effectively and inclusively. Nevertheless, with careful attention and proper preparation, supported by appropriate policies and facilities, VR and AR technologies have the potential to revolutionize the way we teach Islam, making learning more immersive, interactive, and engaging with the essence of Islamic values.

Integration strategy for Islamic Religious Learning with Virtual Reality (VR) and Augmented Reality (AR)

The integration of Virtual Reality (VR) and Augmented Reality (AR) technologies into learning contexts, including Islamic Religious Education, promises immersive and constructive learning experiences. However, implementing these technologies faces technical challenges, high costs, and the need for competent human resources. International bibliometric studies indicate that one key strategy to overcome these obstacles is through strategic partnerships with technology providers and the utilization of cloud-based infrastructure to reduce the complexity, costs, and scalability of technology implementation in education.

Strategic partnerships with technology providers are crucial because they possess the resources, technical knowledge, and experience in developing high-quality and scalable VR/AR content. According to a study of global trends in VR integration in education, collaboration between educational institutions and technology providers can help educational institutions access cutting-edge technology without having to build

¹⁶ Shobri et al., "Augmented and Virtual Reality in Indonesian Madrasah Education: Potentials, Challenges, and Future Directions."

¹⁷ Husnah Lutfiah, "Potensi Dan Tantangan Implementasi Media Pembelajaran PAI Berbasis Augmented Reality," *Berkala Ilmiah Pendidikan* 4, no. 3 (November 30, 2024): 724-730, <https://doi.org/10.51214/BIP.V4I3.1303>.

everything themselves, thereby reducing initial investment costs while accelerating the effective deployment of VR/AR applications¹⁸.

The use of cloud-based infrastructure has also been identified as a key strategy. Cloud-based infrastructure offers the ability to store, process, and deliver VR/AR content on demand, without the need for expensive on-premises servers or hardware. With cloud computing, immersive learning can be accessed through a variety of internet-connected devices (smartphones, tablets, or laptops), expanding the accessibility of technology for schools or institutions with limited resources. In the educational context, the design of immersive cloud-based educational environments (ICBEs) enables the integration of VR/AR with Learning Management Systems (LMS), personalized learning experiences, and faster access to materials without relying on on-premises hardware¹⁹.

In addition to technology and infrastructure, educational institutions' support for continuing professional training is an equally important implementation strategy. VR and AR technologies require specialized skills for educators to effectively utilize them, encompassing both technical competency and digital pedagogy. Technical competency includes basic skills in operating VR/AR devices, understanding how to access cloud content, and initial troubleshooting. Meanwhile, digital pedagogy emphasizes how to utilize VR/AR content to create learning tasks that align with learning objectives, increase student engagement, and facilitate authentic reflection and assessment. In line with Research by Elman (2024) emphasizes that supportive environmental factors such as the availability of facilities, budget, and professional training can facilitate technology adoption among educators and ensure successful implementation in the classroom²⁰.

Thus, by combining strategic partnerships with technology providers, utilizing cloud-based infrastructure, and supporting continuing professional education, educational institutions can create a learning ecosystem that is stronger, more sustainable, and more adaptive to technological change. These strategies not only address the initial challenges of implementation, but also open up opportunities for more engaging, immersive, and contextual learning experiences in line with the demands of 21st-century learning in the context of Islamic Religious Education.

CONCLUSION

The application of Virtual Reality (VR) and Augmented Reality (AR) in Islamic religious education offers significant opportunities to transform the way students understand and apply religious teachings. These technologies enable more interactive and immersive learning, enriching the student experience by offering visualizations of abstract concepts that are difficult to explain through traditional methods. This can increase student motivation and engagement, as well as deepening understanding of the learning material. However, emerging challenges, such as limited infrastructure, expensive hardware costs, and a lack of teacher competency in operating these technologies, need to be addressed to ensure effective implementation.

To address these challenges, the author presents a strategy as an effective solution: engaging in strategic partnerships with technology providers to reduce costs and increase technology accessibility through cloud infrastructure that enables VR/AR learning to be

¹⁸ Agariadne Dwinggo Samala et al., "Virtual Reality in Education: Global Trends, Challenges, and Impacts—Game Changer or Passing Trend?," *Discover Education* 4, no. 1 (July 3, 2025): 229, <https://doi.org/10.1007/S44217-025-00650-Z>.

¹⁹ Serhiy O. Semerikov et al., "Designing an Immersive Cloud-Based Educational Environment for Universities: A Comprehensive Approach," *CEUR Workshop Proceedings* 3844 (2024): 107–16.

²⁰ Elman, "Inovasi Pembelajaran Pendidikan Agama Islam Berbasis Metaverse."

accessed on more affordable devices. Furthermore, educational institutions' support for ongoing professional training for educators is crucial. Although this technology promises more in-depth evaluation is needed to ensure that the technology is truly effective in helping students understand and internalize religious teachings well, however, with a systematic approach and support from various parties, the integration of VR and AR in Islamic religious learning will not only overcome existing obstacles, but also open up opportunities to create a more quality and relevant learning experience in this digital era.

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