

**VIRTUAL REALITY AND ARTIFICIAL INTELLIGENCE IN ISLAMIC
WORKSHIP COMPETENCY ASSESSMENT IN MADRASAH****Muhammad Nur, Zulfritri, Muhibbudin, Suhelayanti**¹²³⁴ Tarbiyah Faculty, Institut Agama Islam Negeri Langsa, IndonesiaEmail: m.nur@iainlangsa.ac.id**Abstract**

The This study aims to analyze the potential of immersive Virtual Reality (VR) technology in creating a realistic simulation environment for Islamic worship practices. This study also explores the relevant artificial intelligence (AI) methodology in providing personalized assessments of the cognitive, affective, and psychomotor aspects of the implementation of worship in a VR environment. In addition, this study identifies the pedagogical benefits and efficiencies resulting from the integration of VR and AI in the assessment of worship competencies, as well as discusses the technical, ethical, and sociocultural challenges that may arise in the implementation of this system. The methodology used is a Systematic Literature Review (SLR) and a narrative-conceptual review, with data sources from academic databases such as Scopus, Web of Science, ERIC, and Google Scholar. Data analysis is carried out through a thematic analysis approach to identify patterns, trends, and gaps in the literature, as well as narrative synthesis to integrate findings from various sources and build a comprehensive theoretical framework.

Keywords: Virtual Reality, immersive VR, Artificial Intelligence, Worship Competency Assessment

A. INTRODUCTION

Worship in Islam, such as prayer, hajj, and umrah, is the main pillar that forms the spiritual and moral identity of a Muslim. The practice of worship that is carried out accurately and accompanied by a deep understanding of each pillar and its conditions not only guarantees the validity of religious rituals, but also contributes to the formation of a character that is disciplined, solemn, and has a strong connection to Islamic values (Halim et al., 2025). In the context of Islamic education, mastery of worship practices is a core component of the curriculum that aims to guide students in carrying out religious obligations correctly and with full awareness. However, the teaching of complex worship practices, such as the procedures for performing Hajj and Umrah, as well as the details of prayer movements, often faces significant pedagogical challenges. Traditional methods that rely on lectures, limited physical demonstrations, and two-dimensional media have been unable to provide the spatial and procedural experience students need (Ekawati, 2022). Limited resources, accessibility constraints, and educators' ability to provide personal feedback to students at scale are factors that hinder the achievement of optimal worship competencies (Afiyah & Usman, 2022).

In facing these challenges, simulation-based approaches and immersive technologies have been identified as promising pedagogical solutions. The use of technologies such as Virtual Reality (VR) in Hajj learning, for example, has been proven to significantly improve students' conceptual understanding, emotional engagement, and mastery of motor aspects (Asril, Syafril, et al., 2023). According to Araiza-Alba et al., (2021) VR-based simulations are able to improve problem-solving skills and procedural understanding in complex learning contexts. In Islamic education, this approach allows students to experience the worship process in a close way to real conditions without having to interact directly with actual physical objects, thus strengthening the internalization of values and ritual sequences holistically.

Although fundamental, the teaching of complex worship practices such as Hajj and Umrah procedures, or the details of prayer movements, often faces various limitations in traditional methods. Learning often relies on limited physical demonstrations, verbal descriptions, or the use of two-dimensional media that are not fully able to replicate the spatial and procedural experience required. Islamic religious education in Indonesia is essential in fostering moral, spiritual, and cultural values. However, conventional teaching methods often prove ineffective in dealing with the challenges of the modern era (Patahuddin et al., 2024). Approach Simulation can be used as an appropriate method in the learning process assuming that not all learning processes can be carried out directly on the actual object (Muttaqin et al., 2021). The absence of simulation with the use of this immersive application can certainly reduce the level of understanding and mastery of students' motor aspects as expected. This causes difficulties for students in actualizing the sequence and nuances of each stage of worship implementation and makes it difficult to develop the competencies of the students themselves holistically. Islamic education in Indonesia plays a strategic role in fostering moral, spiritual, and cultural values. However, conventional teaching methods that are still dominant and often fail to address the challenges of digital era learning, which requires a more interactive and contextual approach (Restalia & Khasanah, 2024). Therefore, the educator urgently need to integrate of simulation technology into learning worship practices to ensure that current and future generations of Muslims master their worship with conviction, accuracy, and deep understanding.

The use of conventional learning methods by teachers in Islamic worship education faces significant challenges, especially in terms of personality and scalability. Providing specific, timely, and individual feedback to each student regarding errors in movement or conceptual understanding is a complex task and requires large resources, especially in classrooms with large numbers of students. These limitations make it difficult for educators to accurately diagnose learning difficulties and provide interventions according to the needs of students who are different from each other (Halim et al., 2025). In the context of Islamic education, this is an important pedagogical challenge that requires an innovative approach to ensure that students have the correct understanding and mastery of worship according to religious guidance.

Answering these challenges, the use of Virtual Reality (VR) and artificial intelligence (*Artificial Intelligence/AI*) is a transformative breakthrough in improving students' competencies in worship practices. VR technology allows users to interact with the virtual environment naturally through body movements, which are then translated into computer commands. This simulation of worship practices using VR can create a realistic and interactive learning experience, allowing students to practice harmony and worship movements such as thawaf in the Kaaba or prayer movement sequences in a safe and repeatable environment (Asril et al., 2023; Araiza-Alba et al., 2021).

Meanwhile, AI can complement the experience by providing personalized assessments and adaptive feedback. AI is able to analyze and assess students' abilities from cognitive (fiqh understanding), affective (solemnity), and psycho motor (movement accuracy) aspects authentically and objectively. This technology can also be used by teachers in diagnosing learning difficulties experienced by students in mastering the worship materials taught by teachers to the maximum. Teachers can also handle the problems faced by students according to individual difficulties and needs (Asril, Syafril, et al., 2023). The integration of VR and AI in worship education has the potential to revolutionize Islamic learning approaches, making them more immersive, effective, and inclusive.

This immersive learning approach can actively and directly involve students in practice and interact visually with the worship practice material studied. The media used in this learning is able to display objects and situations that resemble real conditions, thereby increasing understanding and internalization of concepts holistically Truly, (Sulaiman Kurdi, 2021); (Mohamed Salleh et al., 2021). Study by Ekawati, (2022) shows that the use of simulation methods in worship practices in the classroom can increase learning motivation, active involvement, and the use of the material practiced well. Thus, pedagogical transformation through immersive technology and AI not only answers the limitations of conventional methods but also opens up new opportunities in shaping a generation of Muslims who understand and practice worship in a deep, precise, and spiritual manner.

Although the use of immersive technology and Artificial Intelligence in education has progressed rapidly, literature reviews that comprehensively review the integration of the two technologies in the context of improving the competency of Islamic worship practices are still limited. Most of the available research tends to be fragmented, focusing on one technology (VR or AI) or highlighting only specific aspects of religious learning. Therefore, this systematic review aims to facilitate these gaps by presenting a comprehensive overview of the current state of research on the application of VR and AI in Islamic learning and assessment.

Substantially, this study has made an important contribution to the development of Islamic educational science and practice. From a theoretical perspective, this review enriches the treasure trove of knowledge about Islamic educational technology by synthesizing the existing literature on the great potential of VR and AI in the context of worship, identifying research trends, and highlighting areas that still need further exploration. Study by (Halim et

al., 2025) emphasizing the importance of integrating Islamic pedagogical content with digital technology to maintain the relevance of religious education in the modern era. Meanwhile, research by (Araiza-Alba et al., 2021) shows that the use of VR in learning activities is able to improve procedural understanding and emotional engagement in complex learning.

Practically, the findings of this study can be a strategic guide for Islamic educational institutions such as madrasas, Islamic boarding schools, and Islamic universities, in considering and implementing innovative technological solutions to improve the quality of teaching worship practices. VR technology allows for realistic simulations of worship environments, such as the implementation of thawaf or prayer movements, that can be done safely and repeatedly in the classroom or home (Asril, Syafril, et al., 2023). On the other hand, AI plays a role in providing adaptive assessment and personalization of learning, including the analysis of cognitive (understanding fiqh), affective (solemnity), and psycho motor (precision of movement) aspects of students (Abubakari et al., 2023).

By identifying pedagogical benefits, efficiencies, and challenges that may arise—such as infrastructure limitations, resistance to change, and teacher training needs—this study is expected to encourage pedagogical innovation in Islamic studies. This is in line with the findings of Restalia & Khasanah (2024), which emphasizes the importance of transforming Islamic education management in the digital era to build a generation that has character and is adaptive to technology. Thus, Islamic religious education can remain relevant, contextual, and effective in responding to the challenges of the times.

B. METHODS

Systematic Literature Review (SLR) or narrative/conceptual review. The stages carried out to collect data are carried out by: 1) Determination of Topics and Scope, 2) Initial literature search, 3) Literature Selection and Reading, 4) Information Synthesis and Organization, and 5) Review Writing.

In the stage of determining the topic and scope, the first step is to identify areas of interest to review. Next, conduct initial search in various databases using broad or specific keywords to overview the existing literature. For the example, keywords like "VR Islamic worship", "AI Religious", "Hajj simulation VR," and "Islamic pedagogy technology" are used in sources such as Scopus database, Web of Science, ERIC, and Google Scholar. Select the most relevant or influential articles for the review's purpose. Base selection on the arguments or narrative the researcher wishes to build. Then re-synthesize collected information to identify themes, trends, gaps, or construct new arguments conceptual frameworks. In the final stage, the present narrative review' finding in a coherent and logical manner. Focus is on narrative flow, convincing arguments, and strong conclusions.

C. RESULTS AND DISCUSSION

Based on the results of a systematic review of the academic literature in the last three years, it was found that the integration of Virtual Reality (VR)

technology and artificial intelligence (AI) in Islamic worship practices shows significant potential in supporting the learning and evaluation of religious competence. The study identifies three main focuses: the ability of immersive VR to simulate Islamic worship realistically, the AI methods used for personalized assessments, and the pedagogical benefits generated for Islamic education.

Immersive VR for Realistic Islamic Worship Simulation

Virtual Reality is a computer-based technology that allows users to interact in a digitally simulated three-dimensional environment. This technology has proven effective in creating immersive and contextual learning experiences, especially in Islamic education (Araiza-Alba et al., 2021). Recent research shows that immersive VR is able to visually and spatially replicate holy places such as the Kaaba and the Prophet's Mosque, thus allowing students to practice Umrah/Hajj rituals such as performing thawaf, sa'i, and throwing jumrah activities in a simulated environment that resembles real conditions (Asril et al., 2023; Rohmah et al., 2022).

More than just visualization, VR applications are also beginning to integrate accurate simulations of prayer movements, providing an immersive procedural experience and approaching real-life practice. The use of audiovisual effects and interactivity in VR has been shown to increase students' emotional engagement and conceptual understanding of worship materials (Rohmah et al., 2022). One of the crucial aspects of the use of immersive Virtual Reality (VR) in the context of worship is its ability to create a sense of presence—that is, the psychological and emotional feeling of "presence" of students in a virtual environment. This technology not only allows users to observe religious rituals, but also to feel them deeply, thus strengthening spiritual and cognitive engagement with worship practices (Adria, 2024); Kuhne et al., 2023).

A study by Kuhne et al., (2023) shows that VR results in higher levels of emotional presence and engagement compared to two-dimensional media, which has a direct impact on improving spiritual understanding and experience. In the context of Islamic worship, this sense of presence is very important because it helps foster a deeper solemnity and meaning towards each stage of the ritual, such as thawaf, sa'i, and throwing jumrah.

The use of VR also allows students to practice worship in a safe and risk-free environment, so they can build confidence and internalize worship procedures before facing real experiences. This has an impact on improving the ritual competence and spiritual readiness of students in understanding worship activities (Asril, Syafrimen, et al., 2023). Furthermore, the application of VR in worship simulations such as Hajj has been proven to provide a more enjoyable and meaningful learning experience than using traditional methods. In the conventional approach, students can only imagine the process of performing worship based on the narrative or static images provided by their teachers. However, in the use of VR media, students can experience environments that visually and spatially resemble real conditions, thus strengthening their understanding and engagement (Badiozaman et al., 2022 ; Yeh et al., 2022). In the context of Islamic religious education, the application

of VR can be carried out in various forms, such as learning moral values and characters (Herfandi et al., 2020) and the history of the prophets through a visual narrative approach (I. & Razak, 2019). According to Basiron & Zulkifli (2023), the use of VR-based teaching aids in teaching Sirah in Ibtidaiyah madrassas or elementary schools is able to increase students' appreciation of spiritual values and Islamic history in a more profound way.

The main advantage of VR in religious education lies in its ability to create an interactive learning environment and support abstract thinking as well as direct spiritual communication. In its implementation, an immersive three-dimensional simulation, students not only passively receive information, but also experience the learning process actively and reflectively. This allows them to internalize religious values more effectively (Sudiro & Munjin, 2024). Rohmah et al. (2022) also emphasized that VR has a positive impact on fiqh learning, especially in Hajj and Umrah materials. Through in-depth and interactive simulations of worship journeys, students can understand the stages of the ritual visually and contextually, which ultimately improves their memory and spiritual readiness.

The use of Artificial Intelligence (AI) for the assessment of Worship Competencies in Islamic Religious Education.

The integration of artificial intelligence (AI) technology in Islamic religious education opens up great opportunities to improve the efficiency, accessibility, and quality of learning and assessment. AI not only functions as a learning tool, but also as a diagnostic evaluation system capable of comprehensively assessing worship competencies, covering cognitive, affective, and psycho motor domains (Erni et al., 2024; Amaly et al., 2021). The use of AI in learning evaluation is considered to be able to provide more personalized and adaptive feedback, thereby supporting the achievement of the goals of Islamic education holistically (Aprianti Astuti et al., 2024).

1. Cognitive domain

AI can analyze students' understanding of fiqh laws related to worship such as the legal requirements for prayer, the pillars of hajj, and things that cancel ablution. Natural Language Processing (NLP) technology allows AI systems to understand and evaluate students' answers adaptively, both in the form of questions and answers and essay analysis (Erni et al., 2024). A study by (Yahya et al., 2024) shows that the integration of AI in Islamic law courses not only increases learning satisfaction but also expands students' access to personalized teaching materials..

2. Affective Domains

Affective assessment in Islamic worship includes aspects of solemnity, spiritual motivation, and emotional involvement, can be significantly improved through the use of AI. This technology is able to analyze affective indicators by evaluating user interactions in virtual reality (VR) simulations, analyzing micro-facial expressions—with strict ethical considerations—and analyzing students' responses to worship scenarios (Wijaya et al., 2023); This approach allows educators to identify students' levels of spiritual comfort and

focus during the worship learning process in a more objective and in-depth manner.

3. **Psycho motor Domain**

Computer vision allows AI to evaluate the accuracy of physical movements in worship, such as ruku, prostration, thawaf, and sa'i. AI algorithms can compare students' movements with ideal models, identify subtle errors, and provide objective instant feedback (Wijaya et al., 2023; Nurhayati et al., 2024). This assessment is crucial to ensure that the worship practices carried out by students are in accordance with the guidance of Sharia, as well as providing a consistent and accurate evaluation.

The utilization of AI, powered by data-driven algorithms, can significantly reduce human judgment bias and provide instant feedback tailored to individual needs. This advantage is particularly relevant in Islamic religious education, which demands holistic assessment in the cognitive, affective, and psycho motor domains. Therefore, the adoption of AI in worship assessment offers greater efficiency and accuracy, supporting the achievement of comprehensive Islamic educational goals.

The integration of artificial intelligence (AI) in worship learning assessments offers a holistic approach that includes cognitive, affective, and psycho motor aspects. AI not only facilitates efficient and accurate evaluations but also provides relevant feedback to comprehensively improve students' understanding and practice.

The use of artificial intelligence (AI) in worship assessment offers significant objectivity and standardization, reducing the potential for human bias. With the ability to process data in a systematic manner in *real-time*, AI facilitates continuous and adaptive learning tailored to students' individual needs (Erni et al., 2024 ; Susmiyati et al., 2023; Nurhayati et al., 2024).

Pedagogical Benefits and Efficiency of the use of AI in Islamic Education

In the learning process in the classroom, the use of learning media is an essential component that supports the effectiveness of material delivery by educators. The right media can improve the quality of interaction, clarify concepts, and create a more active and enjoyable learning atmosphere. Previous research has shown that the use of learning media has a positive impact on classroom dynamics, such as increasing student participation (Roberts et al., 2023; Tak et al., 2023), in cheerful learning atmosphere (Serevina et al., 2022), as well as improved academic achievement.

In contrast, traditional teaching methods that rely only on verbal lectures and static presentations, such as PowerPoint, often result in monotonous learning experiences, make students passive, and negatively impact academic achievement (Gnanadurai et al., 2022; Hamilton et al., 2021). Therefore, the integration of technologies such as Virtual Reality (VR) and Artificial Intelligence (AI) is a strategic solution in improving the quality of Islamic education, especially in learning worship practices.

The use of VR and AI in Islamic education not only enriches the immersive and interactive learning experience, but also provides efficiency and accessibility benefits. These technologies enable realistic worship simulations without having to physically travel to the holy site, as well as providing high-

quality training for a wide audience without geographical restrictions (Rozi et al., 2024; Asril et al., 2023; Nun et al., 2025). Additionally, AI can assist teachers in handling administrative tasks such as assessment, scheduling, and student data management, so that teaching time can be maximized.

AI-based learning platforms also allow for the personalization of materials according to students' needs, provide adaptive feedback, and increase learning motivation. This transforms worship learning from mere memorization into a dynamic and meaningful experience, which ultimately strengthens students' spiritual commitment and deep understanding; (Salim & Aditya, 2025; Chytas et al., 2022; Sun & Pan, 2021).

Table 1 The Role and Advantages of AI in the Holistic Assessment of Worship

Assessment Aspects	The Role of AI	Advantages
Cognitive	Natural Language Processing (NLP) and text analysis.	Provide in-depth diagnostic evaluation, identify misconceptions in the understanding of fiqh concepts, and enable adaptive learning tailored to individual needs.
Affective	Analyze user interactions, micro facial expressions, and responses to scenarios.	Provide insights into indicators of solemnity, spiritual motivation, and emotional involvement of students during the worship process, while keeping ethical considerations in mind.
Psychomotor	Computer vision and motion analysis.	Offer objective evaluation of the accuracy of physical movements (such as bowing and prostration), as well as providing instant feedback for accurate practice improvement according to Sharia guidance.

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D. CONCLUSION

The integration of Virtual Reality (VR) and Artificial Intelligence (AI) technologies in Islamic education, particularly in the learning and assessment of worship practices, shows significant transformative potential. Immersive VR is able to create realistic simulations of worship environments, allowing learners to experience a deeper sense of presence and stronger spiritual engagement. These simulations not only improve conceptual understanding of worship rituals, but also build emotional and procedural readiness before facing real practices.

AI, on the other hand, offers an objective, adaptive, and data-driven evaluative approach to three main domains of worship competencies: cognitive, affective, and psychomotor. Through technologies such as Natural Language Processing (NLP) and computer vision, AI can diagnose misconceptions, assess movement accuracy, and evaluate students' emotional engagement ethically and measurably. This AI-based assessment allows for more personalized, responsive, and continuous learning, while reducing human bias in the evaluation process.

Pedagogically, the use of VR and AI has a positive impact on classroom dynamics, increases learning motivation, expands access to education, and supports better academic achievement. This technology also offers long-term efficiency through reduced need for physical facilities, as well as scalability in reaching a wider audience without geographical limitations. Thus, learning Islamic worship can be transformed from traditional methods that are verbal and passive to an active, contextual, and meaningful learning experience.

However, it should be acknowledged that this study still faces limitations in the empirical literature that comprehensively addresses all three domains of competence simultaneously in the context of Islamic worship. Therefore, further multidisciplinary and practice-based research is needed to test the effectiveness of VR/AI systems in more depth. Collaboration between technology experts, religious educators, and scholars is key in designing a worship learning system that is not only technologically sophisticated, but also in accordance with Islamic spiritual and pedagogical values.

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