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Teaching Management of Islamic Religion Education Based on Virtual Reality at Junior High School

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ABSTRACT

The rapid advancement of technology has permeated various sectors, including education, introducing innovative tools such as Virtual Reality (VR). VR provides computer-generated simulations that enable immersive interactions between students and teachers within artificial environments. Despite its potential to enhance knowledge and skills, VR adoption in education, particularly in Islamic Religious Education (IRE), remains limited due to challenges such as infrastructure, human resources, and funding. This study investigates the management of VR-based IRE teaching using a qualitative approach. Data were collected through interviews, observations, and document analysis. The data were then processed through reduction, display, and conclusion drawing to provide comprehensive insights into teaching practices and the integration of VR. The findings reveal that IRE teaching management using VR involves three key stages: preparation, action, and evaluation. The use of VR facilitates more effective instructional delivery, engaging students in high-order thinking to solve problems. Furthermore, VR-supported teaching fosters active student participation, increasing engagement by over 35%. The immersive nature of VR creates an interactive and stimulating learning environment, which is particularly beneficial for conveying complex IRE concepts. The integration of VR in IRE presents a promising approach to modernizing religious education and enhancing cognitive and problem-solving skills. However, the study underscores the need to address infrastructural and resource barriers to expand VR adoption in educational settings. This study highlights the potential of VR to revolutionize Islamic Religious Education, emphasizing its role in fostering engagement and higher-order thinking. Efforts to overcome implementation barriers are essential for broader application in education.

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1. INTRODUCTION

In recent years, the rapid advancement of science and technology has permeated nearly every facet of human life, reshaping societal norms and daily interactions. The onset of the Fourth Industrial Revolution has been marked by an unprecedented surge in digital integration, rendering technology an indispensable aspect of modern existence (Corcoran, 2023). This profound transformation has catalyzed the emergence of a digital culture, wherein traditional cultural practices have been redefined and intertwined with technological innovations (Mihelj, Leguina, & Downey, 2019; Hubbard & Aguinis, 2023). Education has not been exempt from these shifts, as advancements in information and communication technologies have restructured pedagogical approaches and learning paradigms (Fernández-Gutiérrez & Calero, 2020). The widespread availability of internet connectivity, even in rural areas, has further democratized access to information, significantly influencing educational practices and learning preferences (Timotheou, Miliou, & Dimitriadis, 2023). Consequently, this ease of access has profoundly shaped students' learning styles, fostering new modes of engagement and interaction with instructional materials (Dantas & Cunha, 2023; Cuevas, 2015).

Thus, the instructional portrait that occurs in the school environment is not only seen as an activity of teachers teaching and students learning, but it is a process of teaching and learning activities that involve both parties, even in cyberspace (Garzón & Pavón, 2020); (Haleem, Javaid, Qadri, & Suman, 2022). They must work together to create a learning atmosphere that supports educational goals according to curriculum demands. According to Ramadhan, learning will effectively run if teachers are able to use learning resources and media properly (Ramadhan, Sukma, & Indriyani, 2019); (Coban, Bolat, & Goksu, 2022); (Fielding & Murcia, 2022). Teachers are required to be able to utilize technological advances to support learning, while students are expected to be actively involved in solving the problems they face (Steinbauer, 2024).

The continuous development of educational technology has introduced numerous tools and media designed to enhance the effectiveness of learning and facilitate the achievement of educational goals (Falloon, 2020). Despite these advancements, many schools have yet to fully harness the potential of technology, resulting in diminished student motivation, reluctance to engage in learning, and heightened boredom during lessons (Fadda, Pellegrini, Vivanet, & Zandonella Callegher, 2022). This shortfall often stems from a lack of diverse, interactive media capable of providing immersive and engaging learning experiences, leading to passive and ineffective instructional practices (Çelik, 2022). Addressing this challenge requires adopting adaptive learning media tailored to students' individual learning styles, particularly those that foster immersive and participatory experiences, ensuring students remain actively engaged in the learning process.

In addition, a more modern and effective transformation of instructional media is needed to accelerate students' understanding of abstract concepts that are complicated and not easily presented in the real world. Therefore, media is needed to transform real environmental conditions into digital environments to visualize abstract concepts and realities that are difficult to present in the classroom (Asfiati, 2020). In other words, the use of effective media can divert students' attention, help overcome learning difficulties, and assist students in understanding difficult material.

From these problems, the authors conclude that educators need learning media that can help them explain difficult material in the classroom presently (Batubara, 2021). They also need learning media that can improve learning outcomes and attract students in accordance with the students' learning desires, which are currently preferred to learn by using tabs or smartphones rather than traditional learning media. In addition, the development of learning media needed not only visual elements but also audio elements (Refdinal, 2022).

Along with the times, learning media also follows technological developments, including print, audiovisual, computers, and technology that combines print with computers. Learning media is an intermediary tool between educators and students that can connect, inform and disseminate messages to create an effective and efficient learning process. One of the learning media that follows technological

developments is Virtual Reality-based learning media. Virtual Reality is a combination of virtual objects and real objects naturally through a computation process, as if it looks real in front of the user (Jaya, 2022).

Virtual Reality (VR) is a technology that provides interaction facilities between users in real time in an area depicted by a computer in 3D images. This media is able to provide users with experiences like they occur in the real world and are involved in it (Setya Wan et al., 2023). VR technology can give a more real, meaningful, immersive, and comprehensive learning experience to the students in a better understanding of sophisticated abstract learning ideas that are not easily presented straightly (Zulfikri, 2023).

The use of VR in instruction reveals the barrier to much more dynamic and realistic learning experiences. In teaching and learning, VR is also reflected on a more efficient and effective tool because it can be implemented anytime and any place as long as there is a network available (Putra & Aisyah, 2021). The application of the VR tool is for the students, not only to look at or listen to the teaching and learning material served but also empower them to experience the material directly. They can seek simulated 3D environments, interact with objects, situations, environment, and then resolve issues or problems in real contexts.

To address the challenges of modern education, educators must embrace innovative approaches to teaching. In the digital era, teachers are no longer just information providers but also facilitators, motivators, learning managers, and designers of media-rich educational experiences. This shift requires educators to develop strong technological literacy to navigate the rapidly evolving landscape of science and technology. Effective learning management plays a critical role in achieving the goals of innovative teaching methods, such as virtual reality (VR)-based instruction. Proper planning, organization, and evaluation are essential, especially for subjects with abstract content, such as Hajj and Umrah in Islamic Religious Education (IRE) (Yuniati & Prayoga, 2019; Akbar et al., 2021).

At State Junior High School 2 Sokaraja, VR technology has been adopted as a learning medium for teaching Hajj and Umrah. Teachers find VR particularly effective for engaging students and helping them deeply understand complex material. This immersive technology not only supports learning objectives but also enhances students' retention and curiosity. The aim of this study is to describe and analyze the management of VR-based IRE learning at the school, focusing on planning, organization, and evaluation. The findings aim to serve as a model for other schools interested in implementing VR technology to enrich their instructional practices.

Learning management is a structured process that includes planning, organizing, implementing, and evaluating all aspects of instruction to achieve educational goals effectively and efficiently (Niati, 2020; Stoner, 1995). Learning differs from studying in that it emphasizes the development of cognitive abilities and the mastery of new knowledge, allowing students to construct understanding through interaction with external information (Franklin & Harrington, 2019). Teachers play a pivotal role in aligning instructional methods with students' diverse talents, motivations, and socioeconomic contexts (Allen & Edelson, 2024). In the case of VR-based learning, this alignment is particularly critical to ensure that the immersive environment fosters intellectual growth and engagement (Haddock, Rivera, & O'Brien, 2023).

VR technology creates simulated environments where users can interact with virtual objects as if they were real, offering an engaging and immersive experience (Refdinal et al., 2023). It includes components such as virtual environments, sensory feedback, and interactivity that make learning dynamic and interactive (Harder, 2023). Historically, VR has evolved from basic simulations like MIT's Aspen Cinema Map in 1977 to modern, sophisticated systems that integrate seamlessly with smartphones and other devices. Today, VR is widely recognized for its potential in education, making abstract concepts tangible and lessons more engaging (Lowood, 2024; Alam & Mohanty, 2023).

The benefits of VR in education are significant. It allows students to explore content beyond traditional textbooks, fostering curiosity, critical thinking, and deeper understanding. VR also enhances creativity and engagement, enabling students to analyze, experiment, and experience learning actively (Araiza-Alba, Keane, & Kaufman, 2022; Passig, Tzuriel, & Eshel-Kedmi, 2022). For teachers, VR simplifies the delivery of complex materials, reduces reliance on lectures, and makes lessons more enjoyable

(Febriana & Pamungkas, 2023). However, challenges such as high costs, limited internet access, and potential health concerns like virtual reality sickness remain barriers to widespread adoption (Chang, Kim, & Yoo, 2020; Akçayır & Akçayır, 2018).

Despite these challenges, VR holds immense promise for teaching Islamic subjects. It can effectively present abstract materials like Hajj rituals and historical Islamic sites, which are often difficult to visualize in traditional classrooms. Prior research highlights VR's ability to increase student motivation, enhance understanding, and make learning more engaging and interactive (Lidianti et al., 2022; Puspawati & Suyadi, 2022). However, the application of VR in Islamic Religious Education remains underexplored, leaving significant opportunities for innovation.

This study focuses on VR's application in teaching Hajj and Umrah, aiming to provide insights into its use in Islamic Religious Education. By documenting the experiences of teachers at State Junior High School 2 Sokaraja, this research seeks to expand the knowledge base on VR in education and inspire broader adoption of this technology in schools. Through a qualitative analysis, this study explores how VR can enhance learning and enrich educational practices in ways that traditional methods cannot achieve.

2. METHODS

This study was conducted at State Junior High School 2 Sokaraja in Banyumas, selected due to its well-equipped computer laboratory, reliable network infrastructure, technologically proficient Islamic Religious Education (IRE) teacher, and prior implementation of VR-based learning in IRE teaching. Data collection methods included in-depth interviews, observations, documentation, and an integrated and intensive approach to data gathering, following established qualitative research methods (Straus, 1987). These methods were validated using the expert judgment technique to ensure their suitability and rigor.

The study focused on exploring the management of VR-based learning in IRE subjects. Data sources included learning documents, as well as primary data collected from IRE teachers and students. To gain a comprehensive understanding, the researchers employed a combination of in-depth interviews, non-participant observations, and document analysis. These methods provided a multifaceted perspective on the planning, implementation, and evaluation processes of VR-based learning.

To ensure the validity and reliability of the data, two triangulation techniques were applied: method triangulation and source triangulation (Creswell, 2018). Method triangulation involved comparing data obtained through different collection techniques, while source triangulation cross-verified information gathered from multiple respondents and documents. This systematic approach ensured that the findings were robust, credible, and reflective of the VR-based learning management practices at the school.

Data analysis was conducted in three systematic stages: data compression, data display, and data inference (Baba, 2021). The data compression stage involves summarizing and condensing raw data by identifying the core elements, selecting the most relevant information, and focusing on key aspects. This step also includes organizing data to highlight emerging themes and patterns, which serve as the foundation for subsequent analysis.

The data display stage involves organizing and presenting data in a structured format that facilitates understanding and interpretation. This can include brief descriptions, tables, graphs, flowcharts, or visual representations of relationships between categories. A clear and systematic presentation not only aids in comprehending complex datasets but also helps identify connections or trends that might otherwise go unnoticed.

Finally, the data inference stage involves interpreting and drawing conclusions based on the presented data. This step includes confirming findings, refining preliminary interpretations, and ensuring the conclusions align with theoretical frameworks. It also involves iterative validation to ensure data consistency and reliability, enhancing the robustness of the results (Sugiyono, 2014). These three stages collectively ensure a comprehensive, structured, and theory-driven approach to analyzing data, which is critical for producing reliable and meaningful research findings.

3. FINDINGS AND DISCUSSION

State of Junior High School 2 Sokaraja in Banyumas is one of the schools that implements information technology-based learning as an effort to help optimize the role and function of schools. The presence of one technology such as VR in the midst of this rapid civilization encourages schools to make this technology a learning medium that can help in the process of students' understanding more optimal and is able to create a pleasant learning atmosphere and motivate students. To improve the learning atmosphere, the use of learning media based on VR technology is intended to increase creativity in creating learning models that are appropriate to the times for educators (Interview with Head Master). In the process of implementing VR technology as IRE learning medium for the Hajj and Umrah material, it is carried out in several stages.

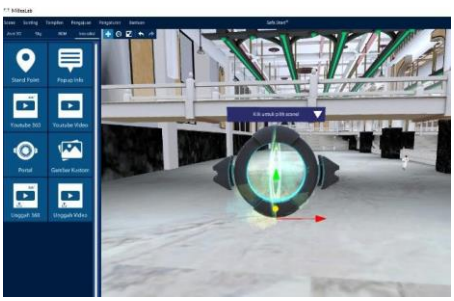
3.1. Preparation and Planning

The process of using VR technology as a medium for IRE learning at State of Junior High School 2 Sokaraja in Banyumas begins with the preparation of a learning design document in the form of a syllabus and Learning Implementation Plan. In addition, teachers also prepare several learning devices, learning materials, evaluation sheets, and organize the equipment that will be used during learning such as VR box devices, Android phones, and laptops. All students are also asked to download the Milea Lab viewer application available on the Android Playstore (interview with teacher).

In the preparation stage, the teacher first creates a virtual world display on the laptop through the MilleaLab Creator by the application. The creation of this content space is intended to make it easier for educators and students to understand the procedures for the Hajj properly and correctly. With this content space, it is hoped that it can be a useful learning medium and make it easier for students, especially in understanding the Hajj material (interview with teacher).

The designed application presents the environment of the Grand Mosque, the Kaaba, Hajar Aswat, the Tomb of Ibrahim, the hills of Sofa and Marwa virtually, so that students can feel the sensation of being in the real world. In addition, the teacher includes some materials and videos that can be played by students related to the material on the Hajj and Umrah. Having preparation stage completed, the teacher instructs students to make groups consisting of 5 children with supported cellphones and VR box devices. The Android cellphone used must have a groyscope feature (360^0 feature). Furthermore, the Islamic Religion teacher, Nailur Rizqi, explained how to use the MilleaLab application which was continued by logging in together via the cellphones they owned. With the classroom code that had been created, students were asked to open the checkpoint containing the material on the Hajj and Umrah (observation, 2024). The following is a document related to the implementation of learning in the classroom.

	Islamic Education Teacher, Nailur Rizqi, explained Hajj Material through VR tool.

	Virtual Reality tool and spectacles of Yunior High School
	To get into Melea Lab
	Figure of Classroom with Hajj and Umrah Material in MileaLab Application
	Figure the area of Sa'i between Safa and Marwa

3.2. Learning Process

The learning process was very lively and enjoyable because the teacher used an active learning strategy that gave students the opportunity to learn the material independently through the VR media. In addition, students were given the opportunity to explore the learning media by following and directing them to checkpoints. During the observation, the teacher only acted as a learning facilitator by monitoring activities and providing direction as needed. Furthermore, the Islamic Religious Education Teacher, Nailur Rizqi, stated;

> *"The use of technology as a learning tool is very important, yes ... because with technology, especially VR, it can increase students' learning motivation, is not boring, and makes it easier for teachers to teach, although at this time, the tool is still relatively expensive, so the number of tools available is not as many as students in class"*

The condition of the facilities that are not yet optimal was also acknowledged by the principal, who stated that the school is determined to increase the amount of its hardware because the use of VR-based media was enthusiastically welcomed by teachers and students. However, teachers must always monitor students so that they do not deviate from the VR path, not other applications (Interview with Principal).

The use of VR learning media in this school also received positive responses from students. One of them is Arianti who stated the following.

> *"In my opinion, yes... this learning is very enjoyable, because the media used is modern, so, something new for me feels more challenging and like actually doing the hajj and umrah". (Interview with student)*

After utilizing VR media finished, the teacher gave a brief explanation, reviewed, and concluded the hajj and umrah material. Furthermore, Nailur Rizqi instructed each group to create a hajj and umrah material scheme that had been obtained. The scheme can be in the form of a power point or mind mapping which is presented at the next meeting. In compiling the material scheme, students are allowed to add material from textbooks or other learning sources (observation, 2024).

3.3. Closing Activity

After completing the assignment of creating a scheme, the teacher reviews the material delivered through the VR technology learning media. This review includes reinforcing key concepts and summarizing the learning outcomes. The teacher concludes the lesson by emphasizing the main points to ensure clarity and retention. At the final stage, self-reflection is encouraged, where the teacher facilitates a discussion by asking reflective questions about the learning process using VR technology. Students are also given the opportunity to raise questions about any material they find challenging or unclear. Additionally, the teacher motivates students to engage with the material more deeply, encouraging them to consolidate their understanding and prepare for the upcoming lesson (Observation, 2024).

The effective implementation of VR as a learning medium requires thorough preparation by the teacher. This preparation involves ensuring the functionality and compatibility of both hardware and software components, as well as assessing and fostering the readiness of students to engage with the technology. Well-planned preparations directly influence the success of the teaching process, making it more structured, engaging, and impactful. Moreover, effective planning enables teachers to integrate VR technology seamlessly into the curriculum, fostering a dynamic learning environment that supports critical thinking and active participation. By addressing technical, pedagogical, and student readiness aspects, teachers can maximize the potential of VR technology to enhance learning outcomes and create a more immersive and interactive educational experience.

3.4. Evaluation

This evaluation stage is the final stage of the process of implementing VR technology as a learning medium for the Hajj and Umrah material. The teacher gives an assignment in the form of a post-test quiz containing 10 multiple-choice questions regarding the material that has been displayed on the VR technology learning media. These questions are already available in the MelleaLab application with checkpoints containing quizzes, so teachers do not have to create questions. The Islamic Religious Education teacher said;

> *"This MelleaLab application has provided a quiz feature, so teachers are no longer bothered to create post-test questions. Because the quiz is individual, group assignments are directed to create mind mapping of hajj and umrah material as a review" (Interview with teacher).*

After students have finished the quiz, the teacher ends the learning with a closing statement so that students are more active in learning.

Discussion

The presence of VR technology in the world of education, especially as a learning medium, provides a unique experience for students to be more motivated in the learning process. This is because the flow carried out in using VR media is able to attract curiosity from students. In addition, the teacher uses a game strategy so that learning feels fun and is able to foster students' enthusiasm. The use of media and learning strategies chosen by the teacher is in line with what Tafano said that learning activities are not just a time filler but have goals that are integrated with the ongoing instruction (Tafonao, 2018). Another consideration when teachers choose learning media is the suitability of the goals to be achieved and the material to be given.

The management of Islamic Religious Education (IRE) learning at State Junior High School 2 Sokaraja aligns with Tang's theory, which emphasizes that all necessary equipment and resources for media-based learning must be prepared in advance to ensure an effective learning process (Tang, Zainal, & Li, 2023). The implementation of VR technology as a learning medium for Hajj and Umrah material is structured into three stages: preliminary or preparatory activities, core activities, and closing activities. This structured approach enhances the effectiveness of the learning process by creating a seamless flow of instruction.

The use of VR media in IRE learning enhances the dissemination and presentation of information by allowing students to interact with immersive, three-dimensional environments. This technology's ability to simulate real-world spaces enables students to explore every detail of a 3D model, such as the Kaaba or other pilgrimage sites, without the need for physical presence. This interactivity fosters deeper engagement and makes learning more effective and efficient. By involving students directly in the virtual environment, VR technology promotes active learning and increases interactivity, which can lead to improved educational outcomes.

Moreover, the immersive nature of VR has a strong emotional impact on students, as it provides a sense of presence and triggers positive emotional expressions, such as excitement and enjoyment. These emotions are critical indicators of high engagement with the learning material and are strongly correlated with better learning outcomes. This observation aligns with Yang's findings, which highlight the role of emotional engagement in improving educational experiences and outcomes (Yang et al., 2023). By creating an emotionally and cognitively engaging learning environment, VR technology not only enhances the understanding of abstract concepts but also motivates students to participate more actively in the learning process.

Based on the analysis obtained, the researchers concluded that the implementation of VR technology as a learning medium of IRE in the Hajj and Umrah material positively impacts learning for students who are more interested and enthusiastic in learning. Because, they can feel and interact like carrying out the Umrah ritual, which usually only uses conventional media with still or monotonous images.

The implementation of VR media at State Junior High School 2 Sokaraja has proven to be highly accessible and user-friendly for students, as it is compatible with smartphones and allows access to content through the MilleaLab application. This accessibility facilitates independent learning, as the features in MilleaLab are familiar and intuitive for today's tech-savvy students. These findings align with Darojat's assertion that MilleaLab can be utilized effectively at home, provided there is an internet connection (Darojat, Ulfa, & Wedi, 2022).

Beyond accessibility, VR media fosters the development of critical and creative thinking skills by presenting students with complex and thought-provoking problems. This aligns well with project-based or problem-based learning approaches, as it encourages students to engage in higher-order thinking and problem-solving (Mudrika, Syaifuddin, & Azmi, 2024). By incorporating such challenges into VR simulations, teachers help students build habits of critical analysis and innovative thinking, which are essential competencies in the 21st century.

To assess the effectiveness of VR-based learning, teachers can leverage MilleaLab's built-in quiz feature to evaluate students' cognitive understanding. The platform offers a variety of quizzes, enabling teachers to select those most aligned with the instructional material. Additionally, the pop-up feedback feature allows teachers to gather real-time input from students, ensuring active participation and continuous improvement during the learning process (Fauziyah & Mulyani, 2024).

The use of VR in Hajj and Umrah simulations is particularly impactful due to its student-centered approach, its capacity as a problem-solving tool, and its dynamic, interactive learning model. These characteristics align with Unwin and McAleese's framework, which emphasizes the importance of engaging, flexible, and problem-oriented educational methods (Unwin & McAleese, 1978). Consequently, VR-based learning not only enhances comprehension of complex material but also creates a more engaging and participatory learning environment.

4. CONCLUSION

The management of Islamic Religious Education (IRE) learning at State Junior High School 2 Sokaraja by teachers involves three key stages: preparation, main activities, and evaluation. Given the modern nature of the learning media, careful preparation is essential, including downloading the MilleaLab platform, designing content and interactive menus, and guiding students in its use. The implementation of MilleaLab significantly enhances self-directed learning, boosts student motivation, and strengthens cognitive competencies, which positively impact teaching and learning outcomes. Its flexibility allows it to be used offline, online, or in a hybrid mode, making it ideal for the 21st-century digital-native generation. The platform's ability to integrate text, images, videos, audio, 3D icons, and quizzes creates a comprehensive and engaging learning experience. Through immersive simulations, such as practicing Hajj and Umrah with 360-degree videos, students gain deeper conceptual understanding and critical thinking skills.

The research highlights the transformative potential of VR in creating a hybrid learning environment that blends digital and physical elements. This facilitates the development of essential skills like problem-solving, critical thinking, and communication through collaborative and interactive exercises. Teachers' roles evolve from being information providers to facilitators, enabling them to guide and monitor student progress effectively. However, VR does not entirely replace the teacher's role as a resource but complements it to enhance learning experiences.

Despite these benefits, the study is limited in its scope, focusing primarily on the use of VR in Hajj and Umrah simulations within IRE subjects. Future research is needed to explore the broader impacts of VR technology on student engagement, learning outcomes, and teacher-student interactions, particularly across other areas of IRE and different educational contexts. This would provide deeper insights into optimizing VR for diverse learning environments and evaluating its long-term effectiveness.

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