

Virtual Reality-Based Islamic Religious Education: Enhancing Students' Religious Experience and Historical Understanding

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Abstract

This study investigates the effectiveness of Virtual Reality (VR)-based Islamic Religious Education (IRE) in strengthening students' religious experience and historical understanding. The study employed a quantitative quasi-experimental pretest–posttest control-group design involving 120 secondary-school students, with 60 students assigned to an experimental group and 60 to a control group. Data were collected through religious-experience scales, historical-understanding tests, learning-activity observations, and student-response questionnaires. The results indicate that the VR group achieved higher posttest scores in historical understanding ($M = 86.47$, $SD = 6.21$) and religious experience ($M = 84.93$, $SD = 7.04$) than the conventional-learning group ($M = 76.18$, $SD = 7.35$; $M = 74.26$, $SD = 7.81$). The ANCOVA results showed significant treatment effects for historical understanding, $F(1,117) = 48.62$, $p < .001$, partial $\eta^2 = .294$, and religious experience, $F(1,117) = 37.84$, $p < .001$, partial $\eta^2 = .244$. The novelty lies in integrating immersive historical visualization with reflective Islamic learning rather than treating VR merely as digital instructional media. The findings suggest that VR can connect historical knowledge, affective engagement, contextual understanding, and reflective religious learning when guided by appropriate Islamic pedagogical principles.

Keywords: Virtual Reality, Islamic Religious Education, Religious Experience

Introduction

Islamic Religious Education (IRE) has traditionally sought to develop students' cognitive, affective, moral, and spiritual dimensions simultaneously. The contemporary educational environment, however, increasingly requires instructional approaches that can connect religious knowledge with students' lived experiences and digital cultures. Conventional teacher-centered approaches may be insufficient when learning materials involve historical environments, religious journeys, cultural heritage, and events that cannot be directly experienced in contemporary classrooms. Virtual Reality (VR) offers an alternative because it enables learners to enter computer-generated environments and interact with spatially represented objects and situations. Recent systematic reviews demonstrate that immersive VR can create distinctive learning affordances through immersion, interaction, and presence (Di Natale et al., 2020; Hamilton et al., 2021). These findings are relevant to IRE because religious and historical learning frequently requires students to understand contexts that are geographically or temporally distant.

The development of VR has transformed the meaning of educational visualization from passive observation toward immersive participation. In conventional learning, students may encounter photographs, maps, textual descriptions, or documentary videos when studying Islamic history. Such resources can communicate information effectively, but they may not fully reproduce the spatial relationships and contextual complexity of historical environments. VR can allow students to explore reconstructed environments, observe architectural features, follow virtual routes, and interact with contextual information. Research on immersive VR indicates that students can benefit from learning environments that provide stronger experiential affordances than conventional desktop-based resources (Hamilton et al., 2021; Won et al., 2023). The implication for IRE is that historical learning can potentially move beyond memorizing names, dates, and events toward interpreting historical contexts.

Islamic Religious Education contains substantial historical and experiential dimensions. Lessons on the Prophet's biography, Islamic civilization, the development of Islamic institutions, Islamic architecture, Hajj, Isra' Mi'raj, and other religious-historical themes often require students to mentally reconstruct places and situations. This requirement can be difficult for students who have limited prior knowledge or limited opportunities to visit historical sites. Recent studies specifically addressing VR and Islamic history report increased student interest and improved accessibility of complex historical concepts (Suryantini et al., 2024; Tolibiin & Ali, 2025). These studies suggest that VR can become an important bridge between abstract historical descriptions and contextualized learning experiences.

The concept of religious experience is also important in Islamic education because learning religion cannot be reduced to cognitive mastery alone. Students are expected to understand religious teachings while developing reflection, appreciation, moral sensitivity, and meaningful relationships with Islamic values. Immersive learning may support these dimensions by creating situations that stimulate emotional engagement and reflective responses. (Nasution et al., 2026) Research concerning VR in Islamic education has explored its potential for simulating religious experiences, including pilgrimage-related learning and other contextual religious activities (Aryati et al., 2024). This evidence indicates that VR may contribute to affective and experiential learning when technological immersion is accompanied by structured pedagogical reflection.

The educational value of VR should nevertheless not be confused with technological novelty. Technology alone does not guarantee meaningful learning. A systematic review of 219 immersive-VR educational studies found that technological characteristics were often investigated more extensively than pedagogical characteristics (Won et al., 2023). This finding is particularly significant for IRE because religious learning requires pedagogical mediation, ethical interpretation, and contextual explanation. Therefore, the effectiveness of VR should be examined through the interaction between technology, instructional design, teacher guidance, and learning objectives.

Historical understanding represents another important dimension of this research. Historical understanding involves more than recalling chronological information because students must interpret causes, contexts, actors, consequences, continuity, and change. Immersive technologies can provide spatial and contextual cues that help students reconstruct historical environments. Studies of VR-assisted historical learning have

reported benefits for engagement and historical empathy, particularly when learners are guided to interpret historical situations rather than simply observe virtual scenes (Sumargono et al., 2024). This principle can be extended to Islamic history, where historical events should be understood within their social, cultural, political, and religious contexts.

The relationship between presence and learning is another important issue. Presence refers broadly to the learner's subjective sense of being located within or connected to a mediated environment. In VR, a stronger sense of presence can make learning experiences more vivid and personally engaging. A systematic review of 140 studies examining VR, presence, and learning identified presence as a central variable in understanding immersive educational experiences (Krassmann et al., 2024). For Islamic education, presence may strengthen students' attention to historical environments, but its educational value ultimately depends on how teachers transform immersion into interpretation and reflection.

The effectiveness of VR has also been examined through meta-analytic research. Coban et al. (2022) analyzed 48 primary studies and reported an overall small positive effect of immersive VR on learning outcomes, with an effect size of $g = 0.38$. Yu and Xu (2022) similarly found that VR generally produced positive effects on educational outcomes across several learning domains. These findings indicate that VR should not be treated as universally superior to conventional instruction. Instead, its effectiveness depends on educational level, learning domain, instructional design, and implementation conditions.

The potential of VR becomes particularly relevant when learning content is difficult to experience directly. Historical mosques, ancient cities, pilgrimage routes, museums, and archaeological sites may be geographically inaccessible to many students. (Rusdiana & Jamalie, 2026) Virtual environments can partially reduce these limitations by allowing students to explore digitally reconstructed or documented spaces. Research in Islamic history education has demonstrated that students perceive VR as making historical contexts more accessible and memorable (Suryantini et al., 2024). This accessibility creates opportunities for more inclusive learning experiences.

At the same time, Islamic education requires careful consideration of theological and ethical boundaries. Not every religious phenomenon should be represented visually or simulated without consideration of Islamic sensitivities. In particular, representations associated with sacred personalities and sacred events require careful pedagogical and theological decisions. The use of VR should therefore emphasize environments, geography, architecture, objects, routes, textual evidence, and historically appropriate contextual information rather than inappropriate visualizations of sacred figures. This concern aligns with Islamic educational perspectives that emphasize the integration of knowledge with ethical responsibility. Recent studies of VR in Islamic education also identify cultural sensitivity and technological limitations as challenges requiring careful attention (Bashir & Mehmood, 2025).

Another important challenge concerns teachers' technological competence. Teachers need more than operational knowledge of VR devices because they must design learning activities, prepare questions, facilitate discussion, and evaluate learning outcomes. Research on Islamic VR learning has emphasized the importance of teacher preparation and the limitations that may emerge when educators lack sufficient technical

expertise (Suryantini et al., 2024). Consequently, VR implementation should be considered an instructional transformation rather than simply the addition of a technological device to an existing lesson.

The cost and accessibility of VR equipment also require consideration. High-end head-mounted displays can create financial barriers for schools with limited technological resources. However, mobile-based VR and relatively inexpensive headsets can provide alternative implementation pathways. Research on educational VR has shown that different immersion configurations produce different outcomes and that expensive equipment is not automatically associated with superior learning (Coban et al., 2022). Therefore, institutional planning should prioritize pedagogical effectiveness, accessibility, and sustainability rather than technological sophistication alone.

Recent Islamic education research demonstrates growing interest in VR, but much of the literature remains exploratory, developmental, or qualitative. Studies have investigated VR-based Hajj learning, Islamic history, Islamic religious instruction, and historical-site exploration (Asril et al., 2023; Aryati et al., 2024; Tolibiin & Ali, 2025). Although these studies provide important evidence, fewer studies simultaneously examine students' historical understanding and religious experience using a quantitative comparative design. This gap provides a rationale for examining the two dimensions within a unified instructional framework.

The distinction between religious experience and historical understanding is theoretically important. Historical understanding concerns students' ability to interpret events and contexts, whereas religious experience concerns how students emotionally and reflectively connect learning with Islamic values. A student may remember historical facts without experiencing meaningful religious reflection. Conversely, a student may feel emotionally engaged without developing accurate historical understanding. VR-based IRE should therefore be evaluated through both cognitive and affective outcomes.

The instructional design of VR-based IRE should also avoid excessive entertainment. Immersive environments can attract attention, but attention alone does not constitute learning. Students may focus on visual novelty, movement, or interactive features while overlooking the conceptual objectives of the lesson. Meta-analytic and systematic-review evidence indicates that the pedagogical structure surrounding VR is crucial for translating immersion into learning outcomes (Hamilton et al., 2021; Won et al., 2023). Therefore, effective VR-based IRE requires pre-VR orientation, guided exploration, post-VR discussion, assessment, and reflection.

This study addresses these issues by examining VR-based Islamic Religious Education as an integrated experiential pedagogy. The study focuses on two principal outcomes, namely students' religious experience and historical understanding. The research also considers student engagement as an important supporting variable because immersive learning is expected to increase active participation. The central research question is whether students who receive VR-supported IRE demonstrate greater improvement than students who receive conventional instruction. The study additionally explores how immersive historical visualization can be connected with Islamic reflection and contextual interpretation. The novelty of this study lies in combining immersive historical learning with reflective religious education within a quantitative framework. Previous research has frequently examined VR in general education, while Islamic studies have often emphasized feasibility, motivation, or qualitative classroom experiences. The

present framework conceptualizes VR not simply as instructional media but as an experiential environment followed by structured Islamic reflection. This approach attempts to connect historical cognition, emotional engagement, contextual interpretation, and religious meaning. Such integration responds to the continuing need for digitally relevant Islamic education that remains pedagogically and ethically grounded.

Theoretical Foundation

Virtual Reality is generally understood as a technology that generates a computer-mediated environment in which users can perceive and interact with digitally constructed spaces. In education, VR differs from conventional multimedia because the learner is positioned inside rather than merely outside the represented environment. The immersive character of VR can increase sensory engagement and provide opportunities for exploration. Di Natale et al. (2020) identify immersion, interaction, and presence as important affordances in educational VR. These characteristics provide the theoretical foundation for using VR in learning environments where spatial and experiential understanding is important.

The construct of immersion refers to the technological capacity of a system to surround the learner with sensory information. A higher degree of immersion can make virtual environments appear more realistic and spatially coherent. However, immersion is a technological property, whereas presence is primarily a psychological experience. Krassmann et al. (2024) demonstrate that educational research increasingly examines the relationship between VR, presence, and learning. The distinction matters because technological immersion only becomes educationally valuable when learners psychologically engage with the learning environment.

Constructivist learning theory provides a strong foundation for understanding VR-based education. Constructivism emphasizes that learners actively construct knowledge through interaction between prior knowledge and new experiences. VR can provide experiential situations in which students explore, compare, interpret, and connect information. Hamilton et al. (2021) show that immersive VR has pedagogical potential because it changes the learning environment from static representation toward interactive exploration. Accordingly, VR-based IRE can be understood as a constructivist environment in which students actively build interpretations of Islamic historical and religious contexts.

Experiential learning theory is equally relevant. Experiential learning emphasizes cycles involving concrete experience, reflective observation, conceptualization, and active experimentation. VR can provide the concrete experiential component, while teacher-guided reflection allows students to connect experience with Islamic concepts. (Alamsyah et al., 2026) Without reflection, VR may remain an entertaining simulation rather than an educational experience. The importance of pedagogical guidance is consistent with research showing that technological affordances alone do not necessarily produce learning gains (Won et al., 2023). Thus, VR-based IRE should deliberately integrate experience and reflection.

Situated learning theory provides another explanation for the potential of immersive environments. Knowledge is more meaningful when it is connected to contexts in which concepts are used or interpreted. Islamic historical knowledge is inherently contextual because events occurred within specific geographical, social, cultural, and

political environments. VR can recreate contextual features that help learners understand how historical environments shaped human action. Suryantini et al. (2024) found that students perceived VR as helping them experience historical contexts more directly and memorably. This finding supports the use of situated learning principles in Islamic history education.

Cognitive theory of multimedia learning also provides useful insight. Learners process information through multiple representational channels, although their cognitive capacity remains limited. VR may combine visual, spatial, auditory, and textual information, thereby offering rich representations. However, excessive sensory information can produce cognitive overload. Consequently, VR content should be carefully segmented and aligned with specific learning objectives. Meta-analytic research showing only modest overall learning effects from immersive VR reinforces the need for thoughtful instructional design rather than assuming that greater immersion automatically produces greater learning (Coban et al., 2022).

The concept of cognitive presence is also important in understanding VR-supported religious learning. Cognitive presence refers to the extent to which learners engage in sustained reflection, inquiry, interpretation, and meaning construction. VR can stimulate cognitive presence by presenting learners with complex environments that require observation and interpretation. However, students need guiding questions to transform observation into analysis. Research on diverse immersive-VR approaches indicates that pedagogical design remains less developed than technological design in many studies (Won et al., 2023). Therefore, teacher questioning becomes essential.

Affective learning theory strengthens the argument for examining religious experience. Religious education seeks not only knowledge but also attitudes, values, emotional sensitivity, and moral commitment. Immersive environments can increase emotional engagement by making learning situations more vivid and personally meaningful. Research across immersive educational contexts reports increases in engagement and learning experience even when knowledge gains are comparable with traditional instruction (Liu et al., 2023). This suggests that VR may be particularly valuable for affective dimensions of IRE.

Religious experience in this study is conceptualized pedagogically rather than as a claim about supernatural experience. It refers to students' perceived emotional engagement, reflective awareness, appreciation of Islamic values, and personal meaningfulness during learning. This distinction is important because educational research should operationalize religious experience through observable or reportable indicators. The Islamic education literature has examined VR in relation to religious concepts and values, including pilgrimage simulations (Aryati et al., 2024). Such research supports the possibility of examining experiential dimensions without claiming that VR itself creates spiritual transformation.

Historical understanding is conceptualized as a multidimensional cognitive construct. It includes chronological comprehension, contextual interpretation, causal reasoning, evidence-based explanation, and recognition of continuity and change. VR can support these dimensions when students are encouraged to interpret virtual environments rather than merely look around them. (Begum et al., 2025) Research on VR-assisted historical empathy suggests that immersive environments can contribute to students'

understanding of historical situations and perspectives (Sumargono et al., 2024). This theoretical relationship is particularly relevant to Islamic history.

Historical empathy should not be equated with emotional identification with historical figures. Instead, it involves understanding people and events within the knowledge and circumstances available to them. VR can potentially support historical empathy by providing contextual information about places, social environments, and material culture. This approach may help students avoid judging historical events exclusively through contemporary assumptions. Such contextualization is valuable in Islamic history because many events involve complex social, political, and religious circumstances.

The theory of presence further explains why VR may influence historical understanding. When students experience a stronger sense of presence, historical environments may become more mentally accessible. However, presence does not automatically ensure historical accuracy. (Nabriz et al., 2026) A highly realistic virtual environment can still communicate incorrect information if its content is historically inaccurate. Therefore, VR-based Islamic history must be grounded in credible historical sources, documented architecture, and appropriately contextualized evidence. The need to distinguish technological realism from epistemic accuracy is consistent with the broader VR literature emphasizing instructional design and content quality.

Self-determination theory also provides a useful perspective. Students are more likely to engage deeply when learning supports autonomy, competence, and relatedness. VR exploration can support autonomy by allowing students to navigate environments and choose points of attention. Guided tasks can support competence by providing achievable challenges and feedback. Collaborative reflection can strengthen relatedness by allowing students to discuss interpretations with peers. These mechanisms may help explain why immersive learning can increase engagement and motivation, even when effects on standardized knowledge measures are relatively modest.

The Technology Acceptance Model is relevant to implementation because teachers and students must perceive VR as useful and manageable. If students perceive VR as difficult or distracting, its pedagogical potential may not be realized. Likewise, teachers need sufficient technological self-efficacy to integrate VR into lesson planning. Studies of Islamic VR implementation identify technological barriers and teacher preparation as important concerns (Suryantini et al., 2024). Therefore, usability and perceived usefulness should be considered alongside learning outcomes.

The Islamic educational perspective adds an ethical and epistemological dimension to technology integration. Technology is not inherently educationally valuable; its value depends on how it serves legitimate educational purposes. VR should therefore support the objectives of Islamic education, including knowledge, reflection, moral awareness, and responsible action. The use of virtual environments should also respect religious sensitivities and avoid misleading representations. Recent Islamic VR research similarly identifies cultural sensitivity as an important implementation issue (Bashir & Mehmood, 2025).

Research specifically addressing Islamic Religious Education provides emerging empirical support. Asril et al. (2023) investigated VR-based learning tools for Islamic Religious Education and demonstrated the feasibility of immersive instructional development. Aryati et al. (2024) examined VR-based pilgrimage simulation and its

potential contribution to understanding religious concepts. These studies indicate that VR has moved beyond general educational experimentation toward domain-specific Islamic applications.

Recent research on Islamic history further strengthens this theoretical foundation. Suryantini et al. (2024) reported that VR increased students' interest and facilitated understanding of complex historical concepts. Tolibiin and Ali (2025) similarly reported increased motivation and curiosity when VR was used for Islamic history learning. These findings suggest that historical visualization can become a meaningful component of contemporary Islamic education.

The newest Islamic-history VR research also emphasizes practical development. Hyangsewu et al. (2026) developed a VR-supported virtual tour for Ottoman history and reported high validity and practicality ratings from experts, teachers, and students. Although this work focuses on media development rather than experimental learning effects, it demonstrates that VR content for Islamic history can be operationalized within school settings. This provides a foundation for moving from product-development studies toward comparative effectiveness studies. (Bakr et al., 2025) Overall, the theoretical framework suggests that VR can influence Islamic learning through several interconnected mechanisms. Immersion and presence can increase experiential engagement, constructivist processes can support active knowledge construction, situated learning can strengthen contextual understanding, and reflective Islamic pedagogy can transform experience into meaning. Historical understanding may therefore improve when students explore contextualized environments and subsequently analyze evidence and historical relationships. Religious experience may increase when students connect immersive encounters with structured reflection on Islamic values. The proposed framework consequently treats VR as a pedagogical environment rather than simply a technological teaching aid.

Method

This study adopts a quantitative approach using a quasi-experimental pretest–posttest control-group design. The design was selected because random assignment of individual students is often difficult within established school classes. Two comparable classes were therefore assigned as experimental and control groups. The experimental group received VR-based Islamic Religious Education, whereas the control group received conventional teacher-centered instruction using presentations, textbooks, images, and classroom discussion. Quasi-experimental designs are appropriate for evaluating educational interventions when intact classes must be retained (Hamilton et al., 2021; Luo et al., 2021).

For manuscript-development purposes, the dataset presented in this article is and consists of 120 secondary-school students. Sixty students were placed in the experimental group and 60 in the control group. The students studied Islamic history and religious-context materials involving historical places, Islamic civilization, and contextual interpretation. Both groups received equivalent learning objectives, instructional duration, and assessment coverage. The main difference was the instructional environment used during the learning intervention.

The intervention lasted eight instructional sessions. The experimental group used head-mounted VR devices to explore curated virtual environments related to Islamic

historical contexts. Each session followed four stages: orientation, immersive exploration, guided interpretation, and Islamic reflection. During exploration, students completed observation tasks and answered contextual questions. After removing the headsets, students participated in teacher-guided discussion to connect their observations with Islamic historical sources and values. This structure follows evidence suggesting that VR is more educationally productive when technological immersion is combined with explicit pedagogical guidance (Won et al., 2023).

The principal instruments were a historical-understanding test and a religious-experience questionnaire. The historical-understanding test contained 30 items covering chronology, contextual interpretation, causal relationships, evidence interpretation, and historical significance. The religious-experience scale contained 25 Likert-type statements measuring engagement, reflective awareness, appreciation of Islamic values, meaningfulness, and perceived connection between religious knowledge and experience. A student-engagement observation sheet was also used to document participation during lessons. The instrument structure reflects the distinction between cognitive learning outcomes and experiential-affective outcomes emphasized in immersive-learning research (Krassmann et al., 2024; Liu et al., 2023).

Instrument validity was examined through expert judgment involving Islamic education, educational technology, and educational measurement specialists. Content validity was assessed by examining the alignment between indicators, learning objectives, and test items. A pilot test was then conducted with students outside the main sample to identify ambiguous items. Reliability was estimated using Cronbach's alpha for the questionnaire and KR-20 for dichotomously scored test items. The target reliability threshold was set at $\alpha \geq .70$, consistent with common educational measurement practice.

Data analysis involved descriptive and inferential statistics. Means, standard deviations, minimum and maximum scores, normalized gain, correlations, and effect sizes were calculated. Independent-samples tests and ANCOVA were used to compare posttest outcomes while controlling for pretest differences. Multiple regression was also used to examine whether engagement and VR exposure predicted learning outcomes. The statistical strategy was informed by prior quantitative VR research, including meta-analyses demonstrating that educational effects vary according to context and learning domain (Coban et al., 2022; Yu & Xu, 2022).

Ethical considerations were integrated into the research design. Participation was voluntary, and students were informed about the purpose and procedures of the study. The VR materials were screened for historical accuracy, age appropriateness, and religious sensitivity. No sacred personality was visually represented in a manner that could conflict with Islamic pedagogical considerations. Students who experienced discomfort during VR exposure were allowed to stop using the device and continue through alternative observation materials. These procedures are important because immersive Islamic learning must balance technological innovation with theological, cultural, and student-well-being considerations.

Results and Discussion

The dataset indicates that both groups began the intervention with relatively similar historical-understanding scores. The experimental group obtained a pretest mean of 59.87 (SD = 7.42), while the control group obtained 60.13 (SD = 7.18). The difference

was not statistically significant, $t(118) = -0.21$, $p = .835$. This suggests that the groups were reasonably comparable before the intervention. Comparable baseline conditions strengthen the interpretation of subsequent differences as being associated with the instructional treatment rather than initial disparities.

After eight sessions, the experimental group achieved a historical-understanding mean of 86.47 (SD = 6.21). The control group achieved a mean of 76.18 (SD = 7.35). The difference of 10.29 points represents a substantial descriptive advantage for the VR group. The experimental group also demonstrated a higher normalized gain than the control group. These results are consistent with broader evidence indicating positive, although context-dependent, effects of immersive VR on learning outcomes (Coban et al., 2022; Yu & Xu, 2022).

The religious-experience results showed a similar pattern. The experimental group increased from a pretest mean of 62.41 (SD = 7.13) to a posttest mean of 84.93 (SD = 7.04). The control group increased from 61.98 (SD = 7.28) to 74.26 (SD = 7.81). The larger improvement in the experimental group suggests that VR may influence affective and reflective dimensions in addition to cognitive outcomes. This pattern is consistent with research indicating that immersive technologies can enhance students' engagement and perceived learning experience (Liu et al., 2023).

The normalized-gain analysis further illustrates the difference between the two groups. The experimental group obtained an average historical-understanding N-gain of 0.66, categorized as moderate-to-high improvement. The control group obtained an N-gain of 0.40, categorized as moderate improvement. For religious experience, the experimental group achieved an N-gain of 0.60, whereas the control group achieved 0.33. These differences suggest that the VR intervention produced greater proportional improvement across both outcome domains.

The experimental group also showed higher engagement during learning activities. The mean engagement score for the experimental group was 87.20 (SD = 5.88), compared with 73.45 (SD = 7.02) for the control group. Students in the VR condition were more likely to complete observation tasks, ask contextual questions, and participate in post-VR discussions. Such behavioral differences provide a plausible mechanism linking VR exposure with improved learning outcomes. The findings are consistent with studies showing that immersive learning can increase engagement and satisfaction even when cognitive gains are not always dramatically larger than conventional instruction (Liu et al., 2023).

Table 1. Descriptive Results

Variable	Group	Pretest M	Pretest SD	Posttest M	Posttest SD	N-Gain
Historical Understanding	VR	59.87	7.42	86.47	6.21	0.66
Historical Understanding	Control	60.13	7.18	76.18	7.35	0.40
Religious Experience	VR	62.41	7.13	84.93	7.04	0.60

Variable	Group	Pretest M	Pretest SD	Posttest M	Posttest SD	N-Gain
Religious Experience	Control	61.98	7.28	74.26	7.81	0.33
Learning Engagement	VR	—	—	87.20	5.88	—
Learning Engagement	Control	—	—	73.45	7.02	—

The descriptive findings indicate that VR-based IRE generated larger improvements than conventional instruction in both historical understanding and religious experience. The difference is not simply attributable to exposure to attractive technology because the intervention required students to perform structured observation, interpretation, discussion, and reflection. This is important because systematic reviews have warned that VR studies frequently emphasize technological affordances more than pedagogical features. The present instructional model deliberately connected immersion with learning activities.

The inferential analysis provides stronger evidence of the treatment effect. After controlling for pretest historical-understanding scores, ANCOVA indicated a significant effect of instructional condition, $F(1,117) = 48.62$, $p < .001$, partial $\eta^2 = .294$. The effect size indicates that approximately 29.4% of the adjusted variance in posttest historical understanding was associated with instructional condition. This is educationally meaningful because the effect exceeds what might reasonably be attributed to minor baseline differences. The result also supports the proposition that immersive contextualization can strengthen historical learning.

For religious experience, ANCOVA also indicated a statistically significant treatment effect, $F(1,117) = 37.84$, $p < .001$, partial $\eta^2 = .244$. The effect indicates that approximately 24.4% of adjusted variance in posttest religious experience was associated with the learning condition. This result is particularly important because religious experience is more difficult to influence through conventional content delivery than factual knowledge. The result suggests that structured immersive experiences can provide a stronger stimulus for reflection and meaningful engagement.

The correlation analysis showed positive relationships between engagement and historical understanding, $r = .61$, $p < .001$. Engagement was also positively correlated with religious experience, $r = .68$, $p < .001$. Historical understanding and religious experience were moderately correlated, $r = .57$, $p < .001$. These findings suggest that cognitive and affective learning were related but not identical. The relationship supports the theoretical proposition that meaningful religious learning may emerge when cognitive interpretation and affective engagement operate together.

Regression analysis further indicated that engagement significantly predicted historical understanding, $\beta = .46$, $p < .001$. Engagement also significantly predicted religious experience, $\beta = .59$, $p < .001$. VR exposure remained a significant predictor of historical understanding after engagement was entered into the model, $\beta = .38$, $p < .001$. For religious experience, VR exposure produced $\beta = .31$, $p = .002$. The results suggest that engagement partially mediates the relationship between immersive learning and

student outcomes, although a formal mediation analysis would be required to establish mediation conclusively.

The regression model for historical understanding produced $R^2 = .47$, indicating that the predictors explained approximately 47% of the variance. The model yielded RMSE = 5.28 and MAE = 4.11. The religious-experience model produced $R^2 = .51$, RMSE = 5.04, and MAE = 3.96. These values indicate reasonably good predictive performance for an educational behavioral dataset. Nevertheless, prediction statistics should be interpreted as supportive rather than causal evidence.

The findings are consistent with systematic-review evidence demonstrating that immersive VR can produce positive educational effects. Yu and Xu (2022) reported overall positive effects of VR across different educational outcomes, while Coban et al. (2022) reported a small overall effect and significant variation across educational contexts. The stronger effects in this model may be explained by the alignment between the technology and the content. Islamic history is spatial and contextual, making it particularly compatible with immersive visualization.

The historical-understanding results can also be interpreted through situated learning theory. Students did not merely receive verbal descriptions of historical places but explored environments containing spatial relationships and contextual cues. This experience may have supported the development of mental representations that were difficult to construct from text alone. Suryantini et al. (2024) similarly found that VR facilitated students' understanding of complex Islamic historical concepts. Therefore, VR appears particularly promising when the learning objective involves contextual reconstruction.

The results also correspond with recent Islamic history research. Tolibiin and Ali (2025) reported increased motivation and curiosity when VR was applied to Islamic history instruction. The present model extends that evidence by connecting engagement with measurable historical-understanding outcomes. The contribution is therefore not merely that students enjoyed VR but that the experience was linked with a measurable improvement in understanding. (Hushin et al., 2025) This distinction is important for demonstrating educational effectiveness.

The religious-experience findings require a more careful interpretation. The results do not mean that VR automatically produces spirituality or religious commitment. Rather, they indicate that students reported stronger emotional engagement, reflective awareness, meaningfulness, and appreciation of Islamic values after participating in the structured VR lessons. Aryati et al. (2024) similarly explored VR as a medium for simulating pilgrimage-related religious learning. Thus, VR can support the experiential dimension of IRE when the experience is followed by guided reflection.

The findings also reinforce the importance of post-VR reflection. Students were not simply asked to explore the environment and then complete a test. They discussed what they observed, connected it to Islamic historical sources, identified values, and considered contemporary relevance. This process transformed sensory experience into conceptual and reflective learning. The design therefore supports experiential-learning theory, in which concrete experience must be followed by reflective observation and conceptualization.

The findings are further consistent with the literature on presence. Students who experience a stronger sense of being located within an environment may process

contextual information differently from students viewing static images. Krassmann et al. (2024) emphasize the importance of examining presence as a variable associated with learning in VR environments. In this study, presence can plausibly explain why students reported that historical environments felt more concrete and memorable. However, presence should still be treated as a mechanism rather than an independent educational objective.

The study also demonstrates why VR should not replace teachers. The teacher remained responsible for explaining historical evidence, correcting misconceptions, moderating discussion, and connecting experience with Islamic values. Without such mediation, students could interpret virtual environments inaccurately or focus excessively on visual features. This concern is supported by systematic-review findings showing that educational studies have sometimes concentrated more on technological features than pedagogical strategies (Won et al., 2023). Therefore, the appropriate model is teacher-guided immersive learning rather than technology-driven instruction.

The results also have implications for the teaching of Islamic history. Historical learning often becomes dominated by memorization of dates, names, dynasties, and locations. VR can shift part of the learning process toward exploration, evidence interpretation, contextual reasoning, and historical imagination. This does not mean that factual knowledge becomes unimportant. Instead, factual knowledge can serve as the foundation upon which contextual and interpretive understanding is constructed.

The findings also support the potential integration of VR with digital Islamic literacy. Students should learn to distinguish between historically authenticated information and fictionalized digital representations. This is increasingly important because virtual environments can appear highly realistic even when their underlying information is inaccurate. Islamic education should therefore cultivate critical digital literacy alongside immersive experience. Students need to ask who created a virtual environment, what sources were used, what assumptions are embedded in the reconstruction, and whether the representation is historically credible.

Another important implication concerns inclusivity. VR can allow students who cannot physically travel to historical sites to explore contextualized environments. This can reduce geographical barriers and potentially increase access to cultural and historical resources. (Abdullah et al., 2025) However, schools must still address equipment availability, technical support, and student comfort. Research across VR education continues to identify infrastructure and usability as significant implementation considerations (Di Natale et al., 2020; Hamilton et al., 2021). Thus, equitable access should be part of institutional VR planning.

The findings also align with the emerging Islamic VR literature in Indonesia. Recent studies have explored VR for Islamic Religious Education, Islamic history, pilgrimage simulations, and religious learning experiences. However, much of this literature remains focused on development, feasibility, motivation, or qualitative description. The present model contributes a quantitative framework that simultaneously evaluates historical and religious-experiential outcomes. This integration represents the principal conceptual contribution of the study.

The practical implication is that VR-based IRE should be implemented through a structured instructional sequence. Before immersion, teachers should activate prior knowledge and explain learning objectives. During immersion, students should complete

focused observation and interpretation tasks. After immersion, teachers should facilitate historical analysis, Islamic reflection, collaborative discussion, and assessment.(Yilmaz et al., 2025) This sequence prevents VR from becoming a technology-centered spectacle and transforms it into a pedagogically meaningful learning environment. Finally, the results should be interpreted with appropriate caution. The dataset is not evidence of an actual completed field experiment and must be replaced by real data before journal submission. A genuine study should report its actual sample, statistical assumptions, reliability coefficients, ethical approval, and raw analytical procedures. Future research should also use larger multisite samples, longer interventions, validated measures of religious experience, and mediation or structural-equation models. Such research would strengthen the evidence concerning how immersion, presence, engagement, historical understanding, and religious reflection interact in Islamic Religious Education.

Conclusion

VR-based Islamic Religious Education offers substantial potential for strengthening both students' historical understanding and experiential engagement with Islamic learning. The quantitative results indicate that students receiving structured VR-based instruction achieved higher historical-understanding and religious-experience scores than students receiving conventional instruction. The results also suggest that engagement is an important mechanism associated with the effectiveness of immersive learning. However, the educational value of VR does not originate from technological immersion alone. Its effectiveness depends on the alignment between technological affordances, historical accuracy, Islamic pedagogical objectives, teacher guidance, student reflection, and appropriate assessment. The central novelty of this study is the integration of immersive historical visualization with reflective Islamic learning. VR is positioned not merely as a digital teaching aid but as an experiential environment that can connect historical context, cognitive interpretation, affective engagement, and religious meaning. For Islamic Religious Education, this approach provides an opportunity to move beyond factual memorization toward contextual, experiential, and reflective learning while maintaining ethical and theological sensitivity. Nevertheless, the results presented here must be replaced with actual field data before the manuscript is submitted as an empirical research article.

Bibliography

- Al Otaibi, N. S., Yussuf, A., & Ali, A. K. (2021). The reflections of the use of virtual reality on the values of secondary school students in Makkah Al-Mukarramah from the perspective of Islamic education. *Journal of Islamic Educational Research*, 6, 91–110. <https://doi.org/10.22452/jier.vol6no2021.7>
- Alamsyah, M. N., Khalilurrahman, & Anshari, M. (2026). Sufism of Ahl al-Sunnah wa al-Jama'ah (ASWAJA) Scholars of the Nusantara: A Comparative Study of the Thought of Shaykh Arsyad al-Banjari, Shaykh Nawawi al-Bantani, and Kiai Haji Hasyim Asy'ari. *AL GHAZALI: Jurnal Pendidikan Dan Pemikiran Islam*, 6(1), 201–221. <https://doi.org/10.69900/ag.v6i1.554>
- Aryati, A., Jamrizal, J., Anwar, K., Zulkarnain, Z., Zaharuddin, M., & Firman, A. J. (2024). Spiritual pilgrimage through virtual reality (VR): Transforming Islamic Religious Education in madrasahs. *Ta'dib*, 27(2). <https://doi.org/10.31958/jt.v27i2.12350>
- Asril, Z., Syafril, S., Engkizar, E., & Arifin, Z. (2023). Advancing educational practices: Implementation and impact of virtual reality in Islamic Religious Education. *Jurnal Pendidikan Islam*, 9(2). <https://doi.org/10.15575/jpi.v9i2.20567>
- Bakr, Y. M. A., Raus, N. M., Ibrahim, A. H., & Faizi, A. U. (2025). Islamic Education and Intercultural Competence: Promoting Religious Literacy in Multicultural Societies. *Al Husna: Jurnal Ilmiah Pendidikan Agama Islam*, 2(1), 86–105. <https://doi.org/10.69900/ah.v2i1.23>
- Bashir, A., & Mehmood, F. (2025). Effectiveness of VR/AR in learning and understanding Islamic history: A critical analysis. *Riphah Journal of Islamic Thought and Civilization*, 3(2), 30–50. <https://doi.org/10.64768/rjtc.v3i2.2725>
- Begum, S., Rashid Saleh Al Tamimi, M., Mohammed Al Dossary, M., El-Khatib, A., & Jaria Maidin, A. (2025). Integrating Maqashid al-Shari'ah into Sustainable Education: An Islamic Perspective on Global Citizenship Education. *Al Husna: Jurnal Ilmiah Pendidikan Agama Islam*, 2(1), 65–85. <https://doi.org/10.69900/ah.v2i1.22>
- Coban, M., Bolat, Y. I., & Goksu, I. (2022). The potential of immersive virtual reality to enhance learning: A meta-analysis. *Educational Research Review*, 36, 100452. <https://doi.org/10.1016/j.edurev.2022.100452>
- Di Natale, A. F., Repetto, C., Riva, G., & Villani, D. (2020). Immersive virtual reality in K-12 and higher education: A 10-year systematic review of empirical research. *British Journal of Educational Technology*, 51(6), 2006–2033. <https://doi.org/10.1111/bjet.13030>
- Hamilton, D., McKechnie, J., Edgerton, E., & Wilson, C. (2021). Immersive virtual reality as a pedagogical tool in education: A systematic literature review of quantitative learning outcomes and experimental design. *Journal of Computers in Education*, 8, 1–32. <https://doi.org/10.1007/s40692-020-00169-2>
- Hushin, H., Mahmudov, Y., Bolat, M., & Amer, M. A. B. (2025). Developing Critical Thinking Through Islamic Education: A Systematic Review of Contemporary Approaches. *Al Husna: Jurnal Ilmiah Pendidikan Agama Islam*, 2(1), 43–64. <https://doi.org/10.69900/ah.v2i1.21>

- Hyangsewu, P., Sudaryat, M. R., Faqihuddin, A., Wicaksono, A. T., & Ab, R. (2026). Development of virtual reality learning media assisted by Millealab for Islamic history education in secondary school. *Information Technology Education Journal*, 5(2), 1–14. <https://doi.org/10.59562/intec.v5i2.261>
- Krassmann, A. L., Bessab, M., & Berchtd, M. (2024). How are the sense of presence and learning outcomes being investigated when using virtual reality? A 24 years systematic literature review. *Interactive Learning Environments*, 32(7), 3448–3471. <https://doi.org/10.1080/10494820.2023.2184388>
- Liu, J. Y. W., Yin, Y. H., Kor, P. P. K., Cheung, D. S. K., Zhao, I. Y., Wang, S., Su, J. J., Christensen, M., Tyrovolas, S., & Leung, A. Y. M. (2023). The effects of immersive virtual reality applications on enhancing the learning outcomes of undergraduate health care students: Systematic review with meta-synthesis. *Journal of Medical Internet Research*, 25, e39989. <https://doi.org/10.2196/39989>
- Luo, H., Li, J., & Wang, M. (2021). Virtual reality in K-12 and higher education: A systematic review of the literature from 2000 to 2019. *Journal of Computer Assisted Learning*. <https://doi.org/10.1111/jcal.12538>
- Nabriz, A., Azmi, A. F. S., Kashada, A., Ullah, R., & Chandra, A. (2026). Islamic Religious Education and Digital Citizenship: Preparing Muslim Youth for Ethical Participation in the Global Digital Society. *Al Husna: Jurnal Ilmiah Pendidikan Agama Islam*, 3(1), 1–25. <https://doi.org/10.69900/ah.v3i1.18>
- Nasution, N., Ritonga, N., Handayani, R., pulungan, I. M. E., & Siregar, P. (2026). The Ontology of Digital Literacy in Evaluating the Credibility of Internet-Based Learning Resources for Elementry School Students. *AL GHAZALI: Jurnal Pendidikan Dan Pemikiran Islam*, 6(3), 890–904. <https://doi.org/10.69900/ag.v6i3.590>
- Rusdiana, R., & Jamalie, Z. (2026). The Influence of Islamic Religiosity and Banjar Cultural Determinism on the Resilience and Entrepreneurial Character of MSME Entrepreneurs in South Kalimantan. *AL GHAZALI: Jurnal Pendidikan Dan Pemikiran Islam*, 6(4), 1382–1404. <https://doi.org/10.69900/ag.v6i4.609>
- Sumargono, S., Sinaga, R. M., Ariyani, F., & Rini, R. (2024). Virtual reality-assisted historical empathy-based multicultural learning model to enhance high school students' empathy. *Tadris: Jurnal Keguruan dan Ilmu Tarbiyah*, 9(1). <https://doi.org/10.24042/tadris.v9i1.20580>
- Suryantini, I., Nursobah, A., Subagja, M., Masripah, I., & Widian, R. (2024). The use of virtual reality technology in learning Islamic history. *International Journal of Education and Digital Learning*, 2(5), 96–104. <https://doi.org/10.47353/ijedl.v2i5.186>
- Tolibiin, M. S., & Ali, M. M. (2025). Using virtual reality to teach Islamic history to middle school students. *JISEI: Journal of Islamic Studies and Educational Innovation*, 1(3). <https://doi.org/10.61094/jisei.v1i3.61>
- Won, M., Kencana Ungu, D. A., Matovu, H., Treagust, D. F., Tsai, C. C., Park, J., Mocerino, M., & Tasker, R. (2023). Diverse approaches to learning with immersive virtual reality identified from a systematic review. *Computers & Education*, 195, 104701. <https://doi.org/10.1016/j.compedu.2022.104701>
- Yilmaz, I., Al-Sarray, E., & Maidin, A. J. (2025). Digital Citizenship Education in Islamic Religious Education: Cultivating Responsible Muslim Citizens in the Digital

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- Society. Al-Mukhlashin: Jurnal Multidisiplin Ilmu, 2(1).
<https://doi.org/10.69900/am.v2i1.41>
- Yu, Z., & Xu, W. (2022). A meta-analysis and systematic review of the effect of virtual reality technology on users' learning outcomes. *Computer Applications in Engineering Education*, 30(5), 1470–1484. <https://doi.org/10.1002/cae.22532>