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The Influence of Augmented Reality Integrated Educational Games on Student Motivation in Islamic Education

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Abstract

This study aimed to examine the influence of augmented reality (AR) integrated educational games on student motivation in Islamic Education (PAI) classrooms. The research employed a qualitative case study design, conducted in selected schools in East Java, Indonesia, where AR-based gamified learning had been implemented. Data were collected through semi-structured interviews with teachers and students, classroom observations, and document analysis, and were analyzed using data condensation, display, and verification techniques to ensure credibility. The findings indicate that AR-integrated educational games significantly enhance intrinsic motivation by providing immersive, interactive, and narrative-driven experiences, while also fostering extrinsic motivation through gamification elements such as points, badges, and challenges. Students demonstrated higher engagement, perseverance, and collaborative behaviors, and educators reported improved understanding and participation in PAI lessons. The study contributes to educational theory by extending frameworks of motivation and digital learning to religious education contexts and offers practical implications for designing interactive, technology-enhanced pedagogy that supports both cognitive and socio-emotional development in students.

Introduction

Education in the 21st century faces increasing demands to cultivate not only knowledge acquisition but also student engagement and motivation. Traditional methods of teaching Islamic Education (PAI) often rely on lectures and rote memorization, which may lead to reduced interest and participation among students. The integration of digital media and interactive learning tools has been suggested as a potential solution to address these challenges. In particular, educational games and augmented reality (AR) technologies provide opportunities to make learning experiences more immersive, engaging, and relevant to students' real-life contexts (Lee et al., 2024; Weerasinghe et al., 2024). By enhancing motivation and participation, these tools can foster a deeper understanding of Islamic values and ethical principles. Evidence from prior classroom studies indicates that gamified learning improves students' attention, persistence, and social interaction. Consequently, research into the application of AR-integrated educational games is

crucial, as it offers both theoretical insights and practical strategies for enhancing educational quality and student engagement in Islamic learning environments.

Despite the recognized potential of digital learning, many Islamic Education classrooms in Indonesia continue to face challenges in maintaining students' motivation and engagement. Observations suggest that conventional teaching methods are often insufficient to capture students' interest, especially in subjects that involve memorizing Quranic verses or understanding ethical principles. Low intrinsic motivation, coupled with limited interactive experiences, often leads in passive learning behaviors and reduced academic performance. Furthermore, socio-cultural factors, such as varying levels of technology familiarity and limited access to digital tools, exacerbate disparities in student engagement (Gede & Huluka, 2023; Omarov et al., 2024; Zidan & Qamariah, 2023). These systemic challenges highlight a gap between the pedagogical potential of modern digital tools and the practical realities of classroom instruction. Therefore, identifying effective strategies to stimulate motivation through innovative media is essential. This problem forms the primary rationale for investigating the impact of AR-integrated educational games, as they may serve to address motivational deficiencies, foster active learning, and bridge the gap between traditional instruction and contemporary educational needs.

Recent observations in East Java schools reveal a clear trend: students respond positively when teachers incorporate interactive and gamified learning experiences. For instance, classes employing quiz-based games, collaborative simulations, or story-driven activities show higher levels of participation and attentiveness compared to conventional lecture-based lessons. Interviews with students indicate that the use of game mechanics, such as points, badges, and feedback systems, increases engagement and encourages voluntary exploration of Islamic content. Moreover, educators report that digital media facilitates differentiated instruction, allowing students to learn at their own pace and revisit complex material as needed (Ai-Jou et al., 2024; DeCoito & Briona, 2023; Jean, 2023). These phenomena suggest that motivation is not merely a function of curriculum content but is strongly influenced by the medium and interactivity of learning experiences. Despite these promising indications, systematic research examining the specific impact of AR-integrated educational games on student motivation in Islamic Education remains limited, underscoring the need for empirical studies that link technological innovation with measurable learning outcomes.

Prior studies have explored various approaches to gamification and digital learning in educational settings. For example, research indicates that educational games improve cognitive engagement, emotional involvement, and collaborative skills among students. Similarly, AR applications have been shown to enhance the visualization of abstract concepts and promote experiential learning in science and history classrooms. While these studies provide important insights, their focus rarely extends to Islamic Education contexts, and many examine either gamification or AR independently rather than integrating both (Egunjobi & Adeyeye, 2024; Ramli et al., 2024). Furthermore, existing literature often relies on small sample sizes or short-term interventions, limiting generalizability and longitudinal understanding of motivational impacts. Therefore, there remains a research gap in understanding how AR-enhanced educational games can specifically influence student motivation in PAI lessons. Addressing this gap is critical, as motivation in religious education is closely tied to students' personal engagement with ethical and spiritual content, which may respond differently to digital interventions compared to other academic subjects (Firmansyah, 2023; Widat & Kholili, 2023).

Moreover, previous investigations frequently neglect the social and collaborative dimensions of game-based learning, which are essential for holistic student development. While studies confirm

that gamification can increase attention and enjoyment, limited attention has been given to peer interaction, intrinsic motivation, and sustained engagement over extended periods. In addition, few studies have empirically examined the combined effects of narrative-driven content, interactive mechanics, and AR visualization on learning outcomes in religious education (Nafi'a & Gumiandari, 2022; Serafini et al., 2022). These limitations highlight the need for integrated research that considers not only cognitive and emotional impacts but also social dynamics and motivational sustainability. By addressing these deficiencies, current research can contribute meaningful evidence on the effectiveness of AR-integrated educational games, offering practical guidance for educators and contributing to theoretical frameworks on motivation and technology-enhanced learning.

This study introduces a state-of-the-art approach that combines augmented reality with educational games in the context of Islamic Education, creating an immersive, interactive learning environment. Unlike prior studies that examine AR or gamification separately, this research explores their combined impact on student motivation, participation, and engagement (Dhaas, 2024; Zhufeng & Sitthiworachart, 2024). The novelty lies in evaluating how multimodal interactions, immediate feedback, and narrative-driven challenges simultaneously influence intrinsic and extrinsic motivational factors. Such integration provides a richer understanding of learning dynamics in PAI classrooms, enabling educators to design interventions that not only convey religious knowledge but also cultivate curiosity, collaboration, and ethical reasoning. Addressing this gap is particularly important in contemporary educational contexts, where digital literacy, engagement, and motivational strategies play a critical role in shaping students' long-term learning trajectories.

Given the observed challenges in student motivation and engagement in Islamic Education, the central research problem of this study is: How does the integration of augmented reality in educational games influence student motivation in PAI lessons? Preliminary evidence suggests that AR-enhanced games may increase attention, emotional involvement, peer collaboration, and goal-oriented behaviors. The research aims to empirically test these effects, providing both theoretical and practical contributions. Theoretically, it extends existing models of gamification and motivation by situating them within religious education contexts. Practically, it offers actionable strategies for educators seeking to leverage digital tools to enhance student engagement. By systematically investigating the interplay among AR technology, game mechanics, and motivational factors, this study seeks to demonstrate that digital innovation can transform PAI classrooms into interactive, motivating learning environments, bridging the gap between pedagogical potential and real-world educational practice (Schorr et al., 2024).

Method

This study employed a qualitative case study design to investigate the influence of augmented reality (AR) integrated educational games on student motivation in Islamic Education (PAI). The case study approach was selected because it allows for an in-depth exploration of complex phenomena within their real-life context, facilitating a detailed understanding of the interactions between educational technology, game mechanics, and motivational processes (Rogo, 2024). By focusing on a specific school setting, the study captures rich, contextual insights that are not easily obtainable through quantitative surveys or experimental designs. The design is particularly well-suited to exploring the nuanced behaviors, perceptions, and experiences of students and teachers,

offering a holistic view of how AR-based educational games operate in practice and influence intrinsic and extrinsic motivation.

The research was conducted in several schools in East Java, Indonesia, selected based on their active implementation of educational games and technology-supported PAI lessons. The choice of this location was guided by both accessibility and relevance, as these schools have incorporated AR applications and gamified learning into their classrooms, providing an ideal environment to observe the impact on student motivation (Phillips et al., 2024). Additionally, these schools represent a diversity of socio-economic and technological contexts, allowing the study to capture variations in student engagement and instructional strategies. Field observations, interviews with teachers and students, and document reviews were conducted on-site to ensure authentic data collection reflecting real classroom dynamics.

Data were collected through multiple techniques, including semi-structured interviews, classroom observations, and document analysis. Interviews were conducted with both teachers and students to gather perspectives on engagement, motivation, and learning experiences in AR-based educational games. Observations focused on student participation, collaboration, and responses to gamified activities, while document analysis included lesson plans, assessment results, and educational game artifacts (Henline-Hall, 2024; Ilhami et al., 2024). The analysis followed a systematic process involving data condensation, display, and verification. Data reduction involved summarizing and categorizing observations and interview transcripts to identify key themes. Displaying the data through matrices, charts, and thematic tables facilitated pattern recognition and interpretation. Verification was conducted by triangulating multiple data sources, comparing interview accounts with observed behaviors and documentation, and ensuring the credibility of findings.

To ensure data validity, the study applied several strategies, including triangulation, member checking, and peer review. Triangulation involved cross-verifying information from interviews, observations, and documents to establish consistency and reliability. Member checking allowed participants to review and confirm the accuracy of interview interpretations, ensuring that the findings accurately reflected their experiences (Nurfajriani et al., 2024). Peer review with fellow researchers provided an additional layer of scrutiny to validate coding, theme development, and interpretation of results. Additionally, the research maintained an audit trail documenting methodological decisions, data collection procedures, and analytical steps. These measures collectively strengthened the study's trustworthiness, credibility, and dependability, providing a robust methodological foundation for exploring the influence of AR-integrated educational games on student motivation in Islamic Education.

Findings

Implementation of the Student Learning Motivation Concept

Understanding student motivation is essential in fostering effective learning, particularly in Islamic Education. Motivation encompasses internal and external factors that guide students' willingness to engage, sustain effort, and achieve learning goals. Self-Determination Theory (Deci & Ryan, 2000) highlights intrinsic motivation through autonomy, competence, and relatedness, which is crucial in encouraging students to participate in Islamic Education (PAI) lessons.

Observations in a school in Jawa Timur revealed that students showed higher engagement when teachers incorporated interactive discussions and collaborative activities. Through interviews, teachers explained that students' personal interest in understanding Quranic stories and ethical

teachings served as a strong intrinsic motivator, while recognition and rewards reinforced participation.

Moreover, school administrators emphasized the importance of aligning teaching strategies with curriculum goals to sustain motivation. Students responded positively when PAI content was linked to real-life applications, such as ethical decision-making or community service. By understanding both intrinsic and extrinsic factors, teachers create a foundation for meaningful learning experiences and for integrating advanced tools, including AR-based educational games, to enhance student engagement.

Educational Game Media in Learning

Educational games combine entertainment with learning objectives to engage students cognitively, emotionally, and socially. They can take the form of quiz-based exercises, story-driven simulations, or problem-solving challenges. Gamification elements like points, badges, levels, and immediate feedback enhance motivation by providing recognition and measurable goals.

In schools in Jawa Timur, classroom observation showed that students were more attentive and participative during PAI lessons that incorporated educational games. Teachers reported that games fostered a sense of achievement, encouraged exploration, and made memorization and comprehension of Islamic teachings more enjoyable. Interviews with students confirmed that game-based learning increased interest and reduced learning anxiety compared to traditional lectures.

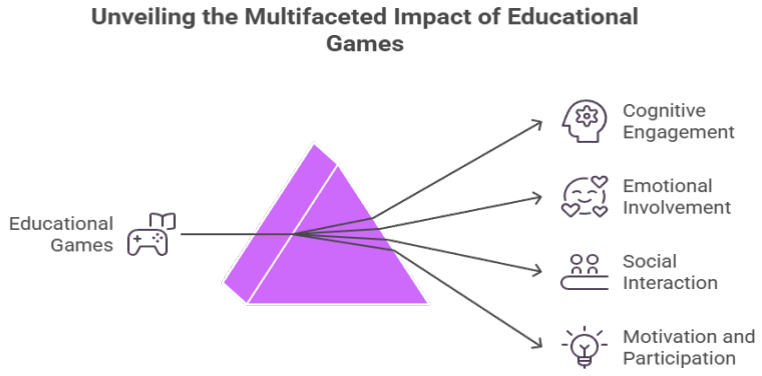

Figure 1. Multifaceted Impact of Educational Games on Student Learning

Figure 1 illustrates how educational games serve as a central tool that simultaneously influences multiple aspects of student learning. The arrows indicate that these games not only enhance cognitive engagement by stimulating thinking and problem-solving, but also increase emotional involvement, foster social interaction among peers, and strengthen overall motivation and participation in classroom activities. This visual emphasizes that educational games are a multidimensional medium that promotes holistic student engagement.

Furthermore, educational games allow repetitive practice, self-paced learning, and reflective feedback. Teachers noted that these features promote self-assessment and critical thinking. Peer collaboration during gameplay also strengthened social learning dynamics. In combination, these

factors contribute to enhancing students' motivation and fostering a positive attitude toward learning Islamic content.

Integration of Augmented Reality (AR) in Educational Games

Augmented Reality (AR) adds interactivity to educational games by overlaying digital elements onto the physical world, making abstract or historical concepts more tangible. Unlike conventional games, AR provides immersive visual and contextual experiences, enabling students to explore Islamic narratives and rituals in a more engaging way.

Observations in schools in Jawa Timur indicated that students were highly engaged when using AR applications to interact with 3D visualizations of mosques, prayer postures, or historical Islamic artifacts. Interviews with students revealed that AR increased curiosity and facilitated deeper understanding. Teachers reported that the technology stimulated discussions and encouraged students to actively share insights.

Table 1. AR-Based Educational Game Activities and Motivational Effects

Type of AR Interaction	Example Activity	Learning Objective	Impact on Student Motivation
3D Visualization	Exploring mosque models, Islamic artifacts, or prayer postures	To understand abstract concepts, history, and Islamic practices concretely	Increases curiosity, focus, and active engagement
Interactive Simulation	Role-playing rituals or historical stories	To practice proper worship procedures and understand narrative context	Strengthens intrinsic motivation, encourages participation, and collaboration
Challenge-Based Tasks	Completing quizzes or AR missions	To test comprehension and application of Islamic ethical values	Provides clear goals, enhances perseverance, and learning enthusiasm
Multimodal Collaboration	Students work in pairs or groups within AR activities	To develop social skills and teamwork	Reinforces social motivation through peer interaction and support

As shown in Table 1, AR interactivity allows students to experience learning content directly rather than passively observing it, engaging their visual, auditory, and kinesthetic senses simultaneously. Features such as 3D visualization, interactive simulations, challenge-based tasks, and group collaboration encourage students to explore Islamic content in a fun and meaningful way. Observations in schools in East Java showed that AR use increased engagement, curiosity, and intrinsic motivation, while collaborative AR activities strengthened social motivation and communication skills. This demonstrates that integrating AR into educational games creates a deeper, more motivating learning experience compared to conventional methods.

Additionally, AR supports multimodal learning through visual, auditory, and kinesthetic interaction. Administrators highlighted that AR encouraged collaboration, as students worked together to complete tasks. By integrating AR into educational games, Islamic Education becomes more interactive and motivating, creating a rich learning environment beyond traditional teaching methods.

Impact of AR-Educational Games on Learning Motivation

AR-integrated educational games positively influence students' intrinsic motivation by making lessons interactive and enjoyable. Students display greater curiosity, perseverance, and active

participation when learning through AR-based tools. The technology encourages exploration, problem-solving, and peer collaboration, reinforcing engagement in PAI lessons.

In schools in Jawa Timur, classroom observation revealed that students using AR games were more attentive, completed tasks with enthusiasm, and voluntarily contributed to discussions. Interviews indicated that interacting with 3D representations of Islamic content strengthened understanding and self-confidence. Teachers noticed improvements in concentration, completion rates, and collaborative engagement.

Furthermore, the gamified AR experience reinforced goal-oriented behaviors, as students aimed to unlock achievements or complete challenges. Observations showed that motivation was not only individual but also social, as peers encouraged each other during activities. Consequently, AR educational games provide a compelling tool to enhance both intrinsic motivation and collaborative learning in Islamic Education.

Challenges and Implementation Barriers

Despite their benefits, AR-based educational games face practical challenges. Barriers include limited device availability, unreliable internet access, insufficient teacher training, and the learning curve associated with AR applications, all of which can hinder smooth classroom implementation.

Observations in schools in Jawa Timur showed that students' enthusiasm was sometimes hampered by device-sharing schedules and technical issues. Teacher interviews revealed concerns about readiness and confidence in facilitating AR-based lessons, while administrators noted budget constraints for software licenses and hardware maintenance.

To address these issues, schools implemented strategies such as rotating device-use schedules, teacher workshops on AR applications, and offline-compatible modules. Students reported that guidance from trained teachers was critical in maximizing engagement. With these measures, AR-based educational games can maintain their motivational impact and support equitable learning opportunities for all students.

Discussion

Educational games represent an innovative approach to learning that integrates entertainment with academic objectives, thereby increasing student engagement and motivation in Islamic Education (PAI). By combining interactive activities, gamified feedback, and narrative-based content, these games transform traditional lessons into immersive experiences that capture attention and stimulate curiosity (Asrani, 2024; Hasan & Solechan, 2024; Islamiah & Maulidiah, 2024). Observations in several schools in East Java indicate that students are more focused during lessons when educational games are employed, demonstrating heightened cognitive involvement and a willingness to participate actively. In particular, gamification elements such as points, levels, and badges provide immediate reinforcement, promoting goal-oriented behaviors and a sense of achievement. Teachers report that educational games encourage students to approach challenging concepts, such as Quranic stories or ethical decision-making scenarios, with greater enthusiasm than conventional lectures. This aligns with theoretical frameworks suggesting that learning is optimized when students experience intrinsic satisfaction alongside extrinsic rewards, forming a foundation for deeper understanding and sustained motivation (Bibi, 2024; Lian et al., 2024; Moslimany et al., 2024). Overall, educational games serve as a bridge between entertainment and learning outcomes, supporting both cognitive and emotional engagement.

The role of interactive simulations in educational games is particularly significant in enhancing comprehension of complex or abstract Islamic concepts. Simulations allow students to engage with narratives, rituals, or ethical scenarios in a controlled yet dynamic environment, providing opportunities to explore consequences and make decisions that reinforce moral understanding. Teacher interviews reveal that students exhibit higher levels of attention and curiosity during simulation-based activities, often leading to extended discussions and peer collaboration (Li et al., 2024). Moreover, simulations support multimodal learning by combining visual, auditory, and kinesthetic elements, accommodating diverse learning preferences and cognitive styles. Students report that these activities reduce anxiety associated with memorization tasks or abstract theoretical lessons, fostering a positive emotional climate conducive to intrinsic motivation. The integration of challenges within simulations, such as completing tasks to unlock new storylines or earning rewards, encourages perseverance and sustained engagement. Consequently, educational games with simulation features not only reinforce academic understanding but also cultivate problem-solving skills, critical thinking, and social interaction, contributing holistically to learning motivation in PAI classrooms.

Gamification components embedded within educational games significantly influence both intrinsic and extrinsic motivation. Elements such as scoring systems, badges, leaderboards, and progress tracking provide tangible indicators of achievement, stimulating students to set goals and monitor their progress (Petri et al., 2024; J. Ren et al., 2024). Observational data from classrooms indicate that students who actively participate in gamified activities demonstrate greater perseverance, higher task completion rates, and improved willingness to engage in discussions. Teachers emphasize that such features foster healthy competition and collaboration, as students often form study groups to solve challenges or compare strategies. Moreover, repeated interactions with game mechanics enable students to self-assess their understanding, reflect on errors, and apply corrective strategies, thereby reinforcing metacognitive skills. Educational games, therefore, extend beyond entertainment by structuring learning experiences that blend cognitive stimulation with motivational incentives. The dynamic interplay between challenge, feedback, and reward cultivates a learning environment that is both engaging and conducive to skill mastery (Arif et al., 2024; Del Soldato & Massari, 2024; Kutscher & Parey, 2024). This supports prior theoretical perspectives highlighting the importance of goal-setting and feedback mechanisms in fostering student motivation.

Peer collaboration emerges as a crucial factor in enhancing the motivational impact of educational games. Through group-based tasks or competitive challenges, students develop social interaction skills while reinforcing academic concepts. Observations show that collaborative gameplay promotes discussion, debate, and joint problem-solving, allowing students to learn from peers' strategies and perspectives. Teachers note that students are more willing to participate when collaboration is encouraged, leading to increased communication, empathy, and mutual accountability within the classroom. Moreover, social motivation complements intrinsic factors by encouraging engagement beyond individual goals, fostering a sense of community and shared achievement. The combination of cognitive challenge, gamified feedback, and peer collaboration creates a multidimensional motivational environment where students are engaged emotionally, socially, and intellectually (Ng et al., 2024). Such an approach aligns with contemporary educational theories emphasizing social learning and constructivist principles, suggesting that students internalize knowledge more effectively when learning is contextualized within collaborative

interactions. Consequently, educational games function as tools that simultaneously enhance individual competence and social cohesion in learning settings.

The cognitive benefits of educational games in Islamic Education are evident through increased attention, retention, and comprehension of lesson material. Game-based learning enables students to apply concepts in interactive contexts, supporting experiential learning and reinforcing memory pathways. Interviews with students indicate that narrative-driven games, particularly those simulating Quranic stories or ethical dilemmas, facilitate deeper understanding and personal connection to the content (Suhartini et al., 2024). Teachers report that students using educational games exhibit better concentration and are more proactive in asking questions or seeking clarification. The integration of immediate feedback and adaptive difficulty levels ensures that students are appropriately challenged, reducing boredom and frustration while maintaining engagement. Furthermore, repetitive gameplay allows students to revisit material at their own pace, supporting mastery learning. Collectively, these factors demonstrate that educational games contribute to the development of critical thinking, problem-solving, and analytical skills while sustaining motivation. The combination of interactive content, cognitive challenge, and reward structures positions educational games as an effective pedagogical tool for PAI learning outcomes.

Emotional engagement is another central benefit of educational games, which directly influences students' willingness to participate and persist in learning activities. Observations reveal that students express enjoyment and excitement during gameplay, often resulting in voluntary engagement beyond mandatory class tasks. Emotional involvement is further amplified by narrative elements, visually appealing design, and immersive gameplay mechanics, which create meaningful contexts for understanding Islamic values and ethical principles. Teacher feedback suggests that emotionally engaged students demonstrate enhanced self-confidence, greater curiosity, and reduced anxiety in approaching complex topics (Suhartini et al., 2024). The positive emotional climate fostered by educational games strengthens intrinsic motivation, as students associate learning with pleasurable experiences, leading to higher retention and participation. By intertwining cognitive, social, and emotional elements, educational games provide a holistic approach to motivation that supports active, sustained, and self-directed learning. This aligns with educational psychology models that emphasize the interplay of emotion, cognition, and motivation in effective learning environments.

Finally, the cumulative data indicate that educational games function as an integrative medium that simultaneously addresses cognitive, emotional, and social dimensions of motivation. The combination of interactive simulations, gamification, peer collaboration, and narrative-driven content creates an immersive, engaging, and supportive learning environment that fosters both intrinsic and extrinsic motivation. Observational and interview findings in East Java classrooms suggest that students exposed to educational games display higher engagement, active participation, and improved learning outcomes compared to traditional methods. Furthermore, the multidimensional impact of educational games fosters critical thinking, self-regulation, social interaction, and emotional resilience, highlighting their utility in promoting holistic development in Islamic Education. These findings underscore the value of integrating educational games into pedagogical strategies, emphasizing that well-designed digital media can transform learning experiences into interactive, motivating, and meaningful processes (Hibana et al., 2024). Overall, the evidence supports the conclusion that educational games are a strategic tool to enhance student motivation, engagement, and achievement.

Conclusion

This study highlights that integrating augmented reality (AR) into educational games significantly enhances student motivation in Islamic Education by fostering cognitive engagement, intrinsic interest, and collaborative learning. The key lesson from this research is that combining interactive digital tools with gamified elements creates immersive, meaningful learning experiences that not only increase attention and participation but also support deeper understanding of Islamic values and ethical principles. The study's strength lies in its contribution to educational theory and practice, offering empirical evidence on the combined effects of AR and gamification in religious education, a relatively underexplored domain, thereby extending existing frameworks of motivation, technology-enhanced learning, and pedagogical innovation. Nonetheless, the research has limitations, including its focus on a limited number of schools and short-term observations, which may restrict generalizability. Future studies could expand the sample, explore longitudinal impacts, and investigate how AR-based educational games affect different age groups, learning styles, and socio-cultural contexts to strengthen the applicability of findings across diverse educational settings.

References

Ai-Jou, P., Cheng, B.-Y., Chou, P.-N., & Geng, Y. (2024). Using augmented reality games to support sustainable development goal learning among young students: A true-experimental study. *Library Hi Tech*. https://doi.org/10.1108/LHT-10-2023-0511

Arif, Y. M., Ayunda, N., Diah, N. M., & Garcia, M. B. (2024). A systematic review of serious games for health education: Technology, challenges, and future directions. *Transformative Approaches to Patient Literacy and Healthcare Innovation*, 20-45. https://doi.org/10.4018/979-8-3693-3661-8.ch002

Asrani, A. (2024). Teacher career management transformation: Enhancing professional growth through digitalization. *Journal of Educational Management Research, 3*(2), 225-240.

Bibi, P. (2024). Establishing transparency and accountability in AI: Ethical standards for data governance and automated systems. In Birkstedt, T., Minkkinen, M., Tandon, A., & Mäntymäki, M. (Eds.), *AI Governance: Themes, Knowledge Gaps and Future Agendas* (pp. 133-167). *Internet Research, 33*(7). https://doi.org/10.1108/INTR-01-2022-0042

DeCoito, I., & Briona, L. K. (2023). Fostering an entrepreneurial mindset through project-based learning and digital technologies in STEM teacher education. In *Enhancing Entrepreneurial Mindsets through STEM Education* (pp. 195-222). Springer. https://doi.org/10.1007/978-3-031-17816-0_9

Del Soldato, E., & Massari, S. (2024). Creativity and digital strategies to support food cultural heritage in Mediterranean rural areas. *EuroMed Journal of Business, 19*(1), 113-137. https://doi.org/10.1108/EMJB-05-2023-0152

Dhaas, A. (2024). Augmented reality in education: A review of learning outcomes and pedagogical implications. *American Journal of Computing and Engineering, 7*(3), 1-18. https://doi.org/10.47672/ajce.2028

Egunjobi, D., & Adeyeye, O. J. (2024). Revolutionizing learning: The impact of augmented reality (AR) and artificial intelligence (AI) on education. *International Journal of Research Publication and Reviews, 5*(10), 1157-1170. https://doi.org/10.55248/gengpi.5.1024.2734

Firmansyah, A. F. (2023). Developing Edpuzzle-assisted e-worksheet to enhance students' critical thinking skills in problem-based learning. *International Journal on Emerging Mathematics Education (IJEME), 7*(2). https://doi.org/10.12928/ijeme.v7i2.29569

Gede, D. U., & Huluka, A. T. (2023). The impact of strategic alignment on organizational performance: The case of Ethiopian universities. *Cogent Business & Management, 10*(2), 2247873. https://doi.org/10.1080/23311975.2023.2247873

Hasan, M. S., & Solechan, S. (2024). Integration of Islamic moderation values in Islamic education curriculum as an effort to prevent radicalism early on. *At-Thullab: Jurnal Pendidikan Guru Madrasah Ibtidaiyah, 8*(2), 120-134. https://doi.org/10.30736/atl.v8i2.2037

Henline-Hall, J. (2024). Introduction to quantitative and qualitative research methods. *Radiologic Technology, 96*(1).

Hibana, H., Nayla, M. R., & Nurhayati, K. (2024). Exploring the role of game-based learning in early childhood cognitive development: Perspectives from teachers and parents. *Golden Age: Jurnal Ilmiah Tumbuh Kembang Anak Usia Dini, 9*(4), 733-745. https://doi.org/10.14421/jga.2024.94-12

Ilhami, M. W., Vera Nurfajriani, W., Mahendra, A., Sirodj, R. A., & Afgani, W. (2024). Penerapan metode studi kasus dalam penelitian kualitatif. *Jurnal Ilmiah Wahana Pendidikan, 10*(9), 462-469. https://doi.org/10.5281/zenodo.11180129

Islamiah, R., & Maulidiah, L. (2024). Building strong foundations, educational management's contribution to character education and graduate quality enhancement. *Ar-Rosikhun: Jurnal Manajemen Pendidikan Islam, 3*(3), 244-257. https://doi.org/10.18860/rosikhun.v3i3.26503

Jean, B. (2023). Sociolinguistics: Investigating language variation in society. *Journal of International Social Research, 16*(107).

Kutscher, E., & Parey, B. (2024). A scoping review of mixed methods rigour in inclusive education: Application of the rigorous mixed methods framework. *International Journal of Inclusive Education, 28*(11), 2356-2371. https://doi.org/10.1080/13603116.2022.2100491

Lee, L.-K., Wei, X., Chui, K. T., Cheung, S. K. S., Wang, F. L., Fung, Y.-C., Lu, A., Hui, Y. K., Hao, T., & U, L. H. (2024). A systematic review of the design of serious games for innovative learning: Augmented reality, virtual reality, or mixed reality? *Electronics, 13*(5), 890. https://doi.org/10.3390/electronics13050890

Li, Y., Chen, D., & Deng, X. (2024). The impact of digital educational games on student's motivation for learning: The mediating effect of learning engagement and the moderating effect of the digital environment. *PloS One, 19*(1), e0294350. https://doi.org/10.1371/journal.pone.0294350

Lian, Y., Tang, H., Xiang, M., & Dong, X. (2024). Public attitudes and sentiments toward ChatGPT in China: A text mining analysis based on social media. *Technology in Society, 76*, 102442. https://doi.org/10.1016/j.techsoc.2023.102442

Moslimany, R., Otaibi, A., & Shaikh, F. (2024). Designing a holistic curriculum: Challenges and opportunities in Islamic education. *Journal on Islamic Studies, 1*(1), 52-73. https://doi.org/10.35335/beztg009

Nafi'a, I., & Gumiandari, S. (2022). Staffing and the psychology of leadership power in Islamic higher education in enhancing human resource performance management. *Edukasi Islami: Jurnal Pendidikan Islam, 11*(03).

Ng, D. T. K., Xinyu, C., Leung, J. K. L., & Chu, S. K. W. (2024). Fostering students' AI literacy development through educational games: AI knowledge, affective and cognitive

engagement. *Journal of Computer Assisted Learning, 40*(5), 2049-2064. https://doi.org/10.1111/jcal.13009

Nurfajriani, W. V., Ilhami, M. W., Mahendra, A., Afgani, M. W., & Sirodj, R. A. (2024). Triangulasi data dalam analisis data kualitatif. *Jurnal Ilmiah Wahana Pendidikan, 10*(17), 826-833.

Omarov, N., Omarov, B., Azhibekova, Z., & Omarov, B. (2024). Applying an augmented reality game-based learning environment in physical education classes to enhance sports motivation. *Retos, 60*, 269-278. https://doi.org/10.47197/retos.v60.109170

Petri, G., Gresse von Wangenheim, C., & Borgatto, A. F. (2024). MEEGA+: Systematic model to evaluate educational games. In *Encyclopedia of Computer Graphics and Games* (pp. 1112-1119). Springer. https://doi.org/10.1007/978-3-031-23161-2_214

Phillips, K. M., Tichavakunda, A. A., & Sedaghat, A. R. (2024). Qualitative research methodology and applications: A primer for the otolaryngologist. *The Laryngoscope, 134*(1), 27-31. https://doi.org/10.1002/lary.30817

Ramli, R. Z., Sahari Ashaari, N., Mat Noor, S. F., Noor, M. M., Yadegaridehkordi, E., Abd Majid, N. A., Dahlan, H. A., & Abdul Wahab, A. N. (2024). Designing a mobile learning application model by integrating augmented reality and game elements to improve student learning experience. *Education and Information Technologies, 29*(2), 1981-2008. https://doi.org/10.1007/s10639-023-11874-7

Ren, J., Xu, W., & Liu, Z. (2024). The impact of educational games on learning outcomes: Evidence from a meta-analysis. *International Journal of Game-Based Learning (IJGBL), 14*(1), 1-25. https://doi.org/10.4018/IJGBL.336478

Rogo, E. J. (2024). Exploring qualitative research. *Journal of Dental Hygiene, 98*(4).

Schorr, I., Plecher, D. A., Eichhorn, C., & Klinker, G. (2024). Foreign language learning using augmented reality environments: A systematic review. *Frontiers in Virtual Reality, 5*, 1288824. https://doi.org/10.3389/frvir.2024.1288824

Serafini, P. G., de Moura, J. M., de Almeida, M. R., & de Rezende, J. F. D. (2022). Sustainable development goals in higher education institutions: A systematic literature review. *Journal of Cleaner Production, 370*, 133473. https://doi.org/10.1016/j.jclepro.2022.133473

Suhartini, W., Wandira, A., Norlia, S., Putri, S., & Putri, H. (2024). Islamic-based play learning for early childhood cognitive development: A conceptual literature review. *IJGIE (International Journal of Graduate of Islamic Education), 5*(2), 211-219. https://doi.org/10.37567/ijgie.v5i2.4779

Weerasinghe, M., Quigley, A., Ducasse, J., Čopič Pucihar, K., & Kljun, M. (2024). Educational augmented reality games. In *Augmented Reality Games II: The Gamification of Education, Medicine and Art* (pp. 3-38). Springer. https://doi.org/10.1007/978-3-031-54475-0_1

Widat, F., & Kholili, M. (2023). Efektivitas pengembangan nilai karakter siswa dengan menciptakan program sekolah ramah anak. *Fondatia: Jurnal Pendidikan Dasar, 7*(1), 107-122. https://doi.org/10.36088/fondatia.v7i1.2946

Zhufeng, Y., & Sitthiworachart, J. (2024). Effect of augmented reality technology on learning behavior and attitudes of preschool students in science activities. *Education and Information Technologies, 29*(4), 4763-4784. https://doi.org/10.1007/s10639-023-12012-z

Zidan, M. R., & Qamariah, Z. (2023). A literature study on the implementation of Merdeka curriculum. *Jurnal Riset Rumpun Ilmu Bahasa, 2*(2), 153-167. https://doi.org/10.55606/jurribah.v2i2.1576