

Reviewing the Use of Augmented Reality to Enhance Moral Reasoning in Secondary Education

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Abstract- Moral reasoning plays a vital role in the development of students' character and their ability to make ethical decisions. In today's educational landscape, teachers are increasingly utilizing immersive technologies like Augmented Reality (AR) to improve moral education and student engagement. This brief review examines recent literature on the application of AR to foster moral reasoning in secondary school students. It compiles findings from empirical studies conducted between 2020 and 2025, emphasizing the effectiveness, teaching methods, and theoretical frameworks that support the use of AR in moral education. Key themes include AR's ability to present moral dilemmas, enhance empathy, and promote reflective thinking. The review also addresses challenges such as the readiness of technology, alignment of content with values-based curricula, and the need for teacher training. The paper concludes by identifying research gaps and suggesting future avenues for using AR as a transformative tool in moral reasoning education. This review adds to the ongoing conversation about digital innovation in moral education and provides valuable insights for educators, instructional designers, and policymakers.

Keywords- Augmented Reality, Moral Reasoning, Secondary Education, Interactive Learning, Educational Technology

I. INTRODUCTION

As defined by Azuma (1997), Augmented Reality (AR) is a system that merges real and virtual elements, allowing for real-time interactivity and the registration of 3D objects in the physical world. In educational environments, AR has become a valuable tool that enhances learning by overlaying digital components like text, animations, and interactive objects onto the real world, accessible through mobile devices or smart glasses. These digital components are not physically present but can be viewed and interacted with using AR-enabled devices, such as smartphone cameras, tablets, or head-mounted displays (Billinghurst & Dünser, 2012). In education, AR provides a platform for immersive learning experiences that promote deeper understanding and critical thinking. Specifically in moral education, AR allows students to engage with simulated ethical dilemmas, visualize the outcomes of their decisions, and interact with virtual characters in real-life scenarios. These experiences aid in the development of moral reasoning, which is essential for ethical behaviour and values-based education (Narvaez, 2010).

Recent developments in augmented reality (AR) technologies have enabled more impactful and

personalized learning experiences, where the content is not only educational but also emotionally resonant. By monitoring users' viewpoints and enriching their sensory experiences with context-specific digital information, AR offers additional learning opportunities that may be challenging to replicate in conventional classroom environments. For instance, when a student interacts with a virtual scenario addressing bullying or environmental stewardship, they are encouraged to explore various viewpoints and rationalize ethical choices, which supports the objectives of moral reasoning development (Rest, 1986; Bers, 2020). As educational institutions increasingly adopt learner-centered and technology-enhanced teaching methods, the use of AR in moral education presents exciting possibilities. However, integrating AR also brings challenges, such as aligning with the curriculum, ensuring adequate technological infrastructure, and preparing teachers. This review examines the current literature on the application of AR to improve moral reasoning in secondary education, summarizing findings, theoretical insights, and research gaps that can guide future educational innovations.

II. PROBLEM STATEMENT

The swift advancement of digital technologies, particularly following the COVID-19 pandemic and the transition to Education 4.0, has encouraged educators to incorporate immersive tools such as Augmented Reality (AR) into their classrooms (Koumpouros, 2024; Lampropoulos et al., 2022). AR boosts student engagement, interactive learning, and the visualization of complex ideas, a trend that is particularly noticeable in STEM and ethics education (Balushi et al., 2024; Ratna Candra Sari et al., 2020). In the context of moral education, AR provides simulated moral dilemmas and contextual scenarios that seem to enhance moral imagination and ethical decision-making (Sari et al., 2020). For example, a study on AR behaviour simulation indicated significant improvements in students' moral imagination compared to conventional teaching methods (Ratna Candra Sari et al., 2020). Another study in Islamic Religious Education found that AR significantly improved students' understanding and internalization of moral values (Ardyansyah & Rahayu, 2023).

Additionally, Shegaram et al. (2024) utilized the Nominal Group Technique to create an AR-based interactive learning model based on Kohlberg's moral development theory. Experts noted that AR has the potential to immerse students in real-life situations and encourage personalized moral reasoning (Shegaram et al., 2024). Reflective thinking, which is crucial for moral reasoning, has also shown measurable improvement when AR is used in secondary education (Alzahrani & Al-Hafdi,

2021). However, despite these positive outcomes, challenges remain in implementing AR, including curriculum integration, teacher readiness, and technological infrastructure (Koumpouros, 2024; Giannakos et al., 2022). A professional development program in Cyprus and Greece revealed that teachers recognized AR's potential and were eager to adopt it, but they stressed the necessity for high-quality training and supportive content that aligns with current curricula.

Moreover, meta-analytic research suggests that augmented reality (AR) enhances higher-order thinking skills, such as moral reasoning, more effectively than traditional teaching methods (Lu et al., 2025). Reviews of high school studies indicate that AR also fosters critical, creative, and ethical thinking among students (Balushi et al., 2024; Tuwoso et al., 2021). However, there is a lack of focused research on moral reasoning in secondary education, with existing studies being limited and varied. In conclusion, while AR appears to positively impact moral reasoning, moral imagination, and reflective thinking in secondary students, the current body of research is fragmented and methodologically diverse (Sari et al., 2021). Therefore, a comprehensive review is necessary to evaluate the scope, teaching strategies, theoretical foundations, and challenges of AR in moral education. This mini review aims to fill that gap by compiling studies from 2020 to 2025 to inform future research and educational practices.

Challenges in Traditional Moral Education

Conventional moral education in secondary schools largely depends on rote memorization and passive teaching methods, which greatly restrict student involvement and lead to only a superficial understanding of moral values (Alkan & Nazarova, 2024). Teaching practices typically consist of lectures and memorizing moral definitions, a technique that students increasingly view as disconnected from real-life relevance and application (Reddit Student Feedback, 2023). These traditional methods often do not promote critical moral reasoning, as they present ethical dilemmas without encouraging students to actively participate in ethical analysis, consider different perspectives, or make value-based decisions (Allcoat & von Mühlennen, 2018; Conroy & Emerson, cited in Ratna Candra Sari et al., 2020). Additionally, the lack of contextual and experiential learning opportunities hinders the development of moral imagination, preventing students from connecting abstract moral concepts to tangible real-world outcomes, resulting in a passive and shallow learning experience (Ratna Candra Sari et al., 2020). This issue is particularly troubling during adolescence, a crucial developmental period when moral identity and advanced moral reasoning start to take shape (Kohlberg; Rest; Shegaram et al., 2023). Therefore, there is an urgent need to rethink the approach to moral education to incorporate methods that encourage greater engagement, reflective thinking, and skills for making ethically informed decisions.

Institutional and Infrastructural Barriers

The successful incorporation of innovative teaching methods like Augmented Reality (AR) in moral education relies heavily on systemic and institutional backing. However, many secondary schools encounter ongoing challenges that impede effective implementation. A significant problem is the lack of teacher preparedness; many educators do not receive adequate training in AR tools and find it difficult to confidently utilize student-centered AR teaching methods. Research by Koskela et al. (2023) and a professional development initiative in Cyprus and Greece (2020) indicates that this reluctance often arises from limited experience with immersive technologies, time limitations, and a lack of institutional training support. Additionally, a disconnect between AR content and the current moral education curriculum further complicates matters. As noted by Alzahrani (2020) and Lampropoulos et al. (2022), the educational frameworks that support AR applications frequently do not align with the moral and ethical objectives highlighted in existing syllabi, making it challenging for teachers to incorporate AR activities into their lessons.

Beyond pedagogical issues, infrastructural challenges also present significant barriers. Many schools, especially those in underfunded areas, face difficulties such as insufficient access to devices, unreliable internet connections, and limited budgets for technological improvements (Koumpouros, 2024; Lampropoulos et al., 2022). These resource constraints directly affect the practicality and scalability of AR in moral education. As a result, disparities in access to AR continue to grow, exacerbating existing educational inequalities and hindering efforts to create inclusive and innovative learning environments (Mai & Liu, 2019; Demircioglu et al., 2023). Therefore, it is crucial to address these institutional and infrastructural challenges to ensure the effective and equitable integration of AR in teaching moral reasoning at the secondary level.

Potential of Augmented Reality to Address Identified Issues

An increasing amount of research highlights the transformative capabilities of Augmented Reality (AR) in tackling the ongoing issues of moral education in secondary schools. Unlike conventional teaching methods, AR provides immersive, interactive, and emotionally engaging learning experiences that actively involve students in developing their moral understanding. One of AR's most significant benefits is its ability to recreate real-life moral dilemmas, enabling students to engage in role-playing ethical situations related to topics like bullying, environmental stewardship, or digital citizenship. These experiences enhance moral imagination, promote experiential perspective-taking, and encourage reflective moral judgment (Ratna Candra Sari et al., 2020). By doing so, AR moves beyond abstract textbook learning, placing students in realistic and emotionally charged situations that require them to make value-based choices.

In addition to ethical simulations, AR has been found to improve reflective thinking, which is crucial for moral development. Engaging with digital content that reacts to students' choices can foster metacognitive involvement and critical reflection (Shegaram et al., 2023). This cognitive engagement is further enhanced by the emotional benefits of AR, such as increased student motivation, intrinsic interest, and collaborative learning outcomes. Research in language and environmental education shows that AR not only boosts comprehension but also maintains student focus and encourages active participation (Lara Prieto et al., 2024; Climate Change AR Study, 2025). Moreover, AR's flexibility allows for personalized learning, enabling educators to customize moral scenarios to fit students' developmental stages and sociocultural backgrounds. This tailored approach makes moral education more relevant and impactful, thereby enhancing student outcomes (Shegaram et al., 2023; Lampropoulos et al., 2022).

However, these educational benefits are not guaranteed. Successfully implementing AR in moral education necessitates careful planning, well-organized teacher training, and infrastructure that can support AR-based learning. Without alignment with existing curricula and ongoing institutional backing, the integration of AR may end up being superficial or unsustainable (Lampropoulos et al., 2022; Koumpouros, 2024; Giannakos et al., 2022). Therefore, to fully leverage AR's potential in improving moral reasoning, its use must be integrated into a broader educational framework that considers technological, pedagogical, and ethical factors.

Table 1 outlines the main benefits of incorporating Augmented Reality (AR) into moral education, as noted in recent research. The use of AR technologies in teaching moral reasoning provides numerous advantages, especially in boosting student engagement, promoting ethical reflection, and improving decision-making skills. The benefits listed in the table are the most highlighted across various local and international studies, demonstrating AR's ability to shift traditional, passive moral teaching into dynamic, contextually rich, and student-focused learning experiences.

Table 1: Advantages of using AR in Moral education

Author(s)	Title of Study	Advantages of AR in Moral Education
Sari et al. (2021)	Does Behaviour Simulation Based on Augmented Reality Improve Moral Imagination?	AR-based behavioural simulations significantly enhance moral imagination, enabling students to visualize consequences and deepen ethical reflection.
Prasittichok et al. (2024)	Technological Solutions to Fostering Students' Moral Courage	The use of AR-based contextual games fosters moral courage, particularly among university students facing ethical dilemmas.
Xiao-fan et al. (2023a)	AR-Based Contextualized Dilemma Discussion for AI Ethics	Contextual AR learning enhances ethical reasoning, AI ethics awareness, and supports higher-order thinking

		skills through dilemma-based learning.
Heriady (2024)	Integration of AR in Moral Learning in Islamic Religious Education	AR increases student understanding of moral and religious values, making lessons more interactive and spiritually meaningful.
Dadi et al. (2022)	Instilling PAK Values Using AR	AR improves student engagement and comprehension in Christian values education, despite hardware limitations.
M. Ali (2020)	Developing AR-Based Gaming Model for Ethical Education	AR gaming models increase student participation and motivation in primary moral education through interactive play.
Permanasari et al. (2021)	AR for Supporting Ethics Learning Media	Literature review supports AR's role in raising ethical awareness and improving learning effectiveness in ethics education.
Slater et al. (2020)	The Ethics of Realism in VR and AR	Immersive AR experiences can shape moral behaviour and decision-making by simulating emotionally realistic moral environments.
Trapero (2018, included for relevance)	Ethical Issues on Persuasive AR Technologies	Although older, this study reveals that AR can influence psychological and behavioural responses, underlining its power in moral education design.

The benefits of augmented reality (AR) in moral education, as shown in Table 1, reflect an increasing interest in using immersive technologies to enhance ethical reasoning, reflection, and value-based learning. Various studies indicate that AR is particularly effective in simulating real-life moral dilemmas, enabling students to practice perspective-taking, emotional reasoning, and consequence evaluation (Sari et al., 2021; Xiao-fan et al., 2023a). These experiences are vital for developing students' moral imagination, a key cognitive ability in making ethical decisions (Slater et al., 2020). Additionally, AR-based games and contextual scenarios have been found to promote moral courage and reinforce the internalization of values, particularly among adolescents and young adults facing complex ethical challenges (Prasittichok et al., 2024; M. Ali, 2020).

Another significant benefit is the versatility of AR tools across various religious and cultural contexts. Research by Heriady (2024) and Dadi et al. (2022) demonstrated that AR applications in Islamic and Christian education not only increased student engagement but also deepened their understanding of religious moral principles. This underscores AR's ability to tailor learning experiences to align with students' ethical development, backgrounds, and belief systems. Moreover, AR enhances cognitive engagement by transforming traditional learning environments into interactive platforms, fostering reflective moral discussions, as noted by Shegaram et al.

(2023), where students were prompted to critically analyze ethical issues through an AR-supported discussion framework.

However, despite the evident potential of AR in moral education, recent reviews indicate that its integration into values-based teaching is still relatively underexplored compared to its use in STEM or technical fields (Xiao-fan et al., 2023b; Permanasari et al., 2021). While the advantages are apparent ranging from heightened ethical awareness to increased learner motivation its practical application in school-based moral education is still developing. This highlights the need for more empirical research focused specifically on how AR can systematically enhance moral reasoning in various educational contexts.

III. METHOD

This review utilized a systematic literature analysis method to investigate how Augmented Reality (AR) can improve moral reasoning in secondary school students. The main objective was to consolidate existing research, identify new trends, and assess the educational benefits of AR in teaching values. Special attention was given to understanding the role of AR in fostering moral growth, ethical choices, and character development among young learners.

Literature Search Strategy

To provide a thorough overview of the current knowledge base, a systematic search was performed across five key academic databases: Scopus, Web of Science, ERIC, ScienceDirect, and Google Scholar. The search focused on peer-reviewed articles published from January 2020 to April 2025. Various combinations of specific keywords were utilized, including “Augmented Reality,” “moral education,” “ethical reasoning,” “values education,” “AR in education,” and “technology-enhanced moral learning.” Boolean operators like AND/OR were employed to refine and broaden the search results. Furthermore, the reference lists of the most cited studies were manually examined to find relevant papers that may not be included in the main databases. This approach ensured a comprehensive and in-depth identification of studies relevant to the review's objectives.

Selection Criteria

To ensure academic rigor and relevance, specific inclusion and exclusion criteria were established. The studies included in the review were those published in English from 2020 to 2025, concentrating on the application of augmented reality (AR) in educational environments that foster moral reasoning, ethical reflection, or character development. Only studies involving secondary school students or adolescents in similar educational settings were selected. The review considered only empirical studies, conceptual papers, or literature reviews published in peer-reviewed journals, academic books, or conference proceedings from

reputable publishers. Studies were excluded if they (i) did not address moral or ethical learning, (ii) focused exclusively on the technical or design aspects of AR without considering educational outcomes, or (iii) involved learners outside the secondary education scope, such as early childhood or higher education contexts that lacked a moral emphasis.

Data Extraction and Analysis

The data extraction process was guided by a standardized review matrix created to maintain consistency and clarity in synthesizing results from various studies. Important data points included: authors, year of publication, country of origin, participant demographics, type of AR application, educational context, research design, and main findings related to moral reasoning or ethical learning outcomes. A thematic analysis was used to identify common patterns and teaching strategies across the studies. Themes that emerged included the simulation of moral dilemmas, interactive learning environments, gamified moral tasks, and reflection-based AR design as prevalent instructional features. Additionally, studies were classified based on the educational framework used—such as religious moral education, civic character education, or AI ethics—as well as the theoretical foundations applied (e.g., Kohlberg’s Moral Development Theory, Rest’s Four-Component Model, or Constructivist Moral Pedagogy).

Review Limitations

Although a thorough methodology was used, this review has several limitations. First, the search's time frame (2020–2025) may have left out earlier foundational research or the latest grey literature and non-peer-reviewed innovations. Second, the differences in research design, sample sizes, and assessment tools among the studies included made it difficult to directly compare and quantitatively analyze the results. Therefore, this review did not conduct a meta-analysis but instead utilized a thematic and narrative synthesis approach. Future studies could enhance the validation of AR's effectiveness in fostering moral reasoning in various educational settings by incorporating longitudinal data, mixed-method comparative frameworks, and triangulated evidence.

IV. LIMITATION OF AUGMENTED REALITY (AR) AND SUGGESTION FOR FUTERE RESEARCH

While the use of Augmented Reality (AR) in moral education is becoming more common, it faces several challenges. A major issue is the lack of adequate infrastructure and technological access in many schools, especially in underfunded or rural areas, which hinders the regular use of AR-based learning (Lampropoulos et al., 2022; Koumpouros, 2024). Additionally, many teachers do not have the necessary training or pedagogical skills to effectively incorporate AR tools into moral reasoning

lessons, leading to superficial or ineffective applications of the technology (Koskela et al., 2023). Moreover, most current AR applications are not specifically tailored for moral education and often do not align with national curricula or established moral development frameworks like those of Kohlberg or Rest (Shegaram et al., 2023). There is also a lack of understanding regarding the long-term effects of AR interventions on students' moral development, as many studies focus on short-term engagement or perception improvements. From a theoretical standpoint, further research is needed to investigate how AR can promote deep ethical reflection, empathy, and decision-making in various cultural and educational settings.

To fill these gaps, future research should concentrate on creating and validating AR content that is explicitly based on moral education theories and aligned with secondary school curricula. Longitudinal studies are necessary to evaluate not just immediate learning outcomes but also the evolution of students' moral reasoning over time. Additionally, more research centered on teachers is crucial to understand how professional development and teacher attitudes affect the successful integration of AR in values education. Researchers should also consider employing mixed-method approaches that combine quantitative data with qualitative insights for a more comprehensive understanding of AR's effects. Lastly, ethical issues such as data privacy, emotional safety, and bias in simulated scenarios must be carefully addressed in future AR development to create safe and inclusive learning environments. compelling opportunity to rethink how values and ethical reasoning are taught in 21st-century classrooms.

V. CONCLUSION

This review emphasizes the increasing potential of Augmented Reality (AR) as a novel educational tool for improving moral reasoning in secondary school students. The results suggest that AR provides immersive, interactive, and emotionally engaging learning experiences that effectively encourage ethical reflection, perspective-taking, and the internalization of values. By recreating real-life moral dilemmas and facilitating reflective thinking, AR overcomes many limitations associated with traditional, lecture-based moral education. However, while the advantages of incorporating AR into moral education are encouraging, the review also identifies significant challenges, such as technological constraints, insufficient teacher training, and a scarcity of AR content aligned with the curriculum. Furthermore, much of the existing research is fragmented, with few long-term studies investigating the lasting effects of AR on students' moral development. To advance this field, future research should concentrate on creating AR applications that are pedagogically sound, culturally relevant, and empirically validated. Collaboration across disciplines between educators, technologists, and ethicists will be crucial to ensure that AR not only boosts engagement but also promotes authentic moral development in students. As education continues to transform in the digital era, AR

presents a compelling opportunity to rethink how values and ethical reasoning are taught in 21st-century classrooms.

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