

Integration of Augmented Reality Technology in Moral Learning in Islamic Religious Education

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ABSTRACT

Background. The advancement of digital technology requires the world of education to innovate in learning methods, including in the field of Islamic Religious Education (PAI) which teaches moral values. Moral learning, which is often abstract, requires an approach that can effectively improve students' understanding and internalization. The integration of Augmented Reality (AR) technology in moral learning is considered to be able to answer this challenge by presenting a more interactive and contextual learning experience, relevant to the learning style of the current digital generation.

Purpose. This study aims to evaluate the effectiveness of the use of AR in moral learning in PAI, especially in improving students' understanding and practice of moral values. The main focus of the research is to see the extent to which AR technology can contribute to building a deep and practical understanding of moral concepts.

Method. The study used an experimental design with a quantitative approach, involving 100 junior high school students who were divided into an experimental group and a control group. The research instruments include moral comprehension tests, attitude questionnaires, and qualitative interviews to explore students' learning experiences while using AR technology. The data were analyzed using descriptive and inferential statistics.

Results. The results showed that students who studied with AR experienced a significant increase in understanding and internalizing moral values compared to the control group. Students in the experimental group had higher comprehension and engagement scores, which showed the effectiveness of AR in moral learning. AR technology has succeeded in contextualizing moral learning with in-depth and applicative interactive simulations.

Conclusion. The conclusion of this study confirms that AR can be an effective tool in moral learning in PAI. AR integration offers a relevant and applicable approach, allowing students to understand and practice moral values in a deeper way.

KEYWORDS

Augmented Reality, Islamic Religious Education, Moral Learning

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INTRODUCTION

Augmented Reality (AR) technology is increasingly developing and has great potential in supporting various aspects of education, including in the field of Islamic Religious Education (PAI) (Agustiawan, 2022). AR offers an interactive experience that allows users to combine the real world with digital elements, AR offers an interactive experience that allows users to combine the real world with digital elements,



creating a more engaging and immersive learning environment (Al-Ansi et al., 2023). In the midst of the challenges of rapid modernization and technology, traditional learning methods increasingly need to adapt to attract students' interest. With the integration of AR technology in moral learning, religious learning can be packaged to be more interesting and relevant for the younger generation who are familiar with technology (Affandi, 2021).

The use of AR in moral learning offers a more personalized and contextual learning experience (Ardyansyah & Rahayu, 2023). Different from conventional methods that tend to be one-way, AR allows students to interact directly with learning materials, so that they can understand moral values through real-life situation simulations. This technology allows students to not only receive information, but also practice and experience firsthand the moral principles taught. This is expected to increase the understanding and internalization of moral values more deeply (Geroimenko, 2020).

Studies on the integration of AR in education show that this technology can improve students' motivation to learn and memory (Fanini et al., 2023). When used in moral learning, AR can help students to understand the consequences of their actions through realistic and relevant simulations in daily life. For example, the simulation of ethical behavior in the social environment or how to apply noble morals in daily interactions can be easier to understand and remember. This direct experience has a stronger impact than just reading or listening to the material, so that moral values can be better embedded in students (Hussin, 2024; Ibrahim, 2023).

The development of AR-based moral learning also offers an opportunity to overcome the limitations of text-based and lecture-based teaching methods. The use of AR allows for the delivery of moral material that is more visual and contextual, in accordance with the needs of the current digital generation (Girin, 2021; Guritno, 2022). The main challenge in religious education is to make the material taught relevant to the reality of students without losing the essence of moral values themselves. With AR, educators can present moral learning that is more applicable and realistic, so that students can relate the material to real situations they may face outside the school environment (Assa'idi, 2021).

The study of the use of AR in PAI learning shows significant potential in modernizing teaching methods and increasing effectiveness in conveying moral messages. AR helps simplify abstract concepts in morality and present them in a form that is easier to understand (Clausen et al., 2020). In addition, this method can also help educators to explain the complexity of ethics and religious values in a simpler, more interesting, and in-depth way. With AR, students can see firsthand the positive and negative consequences of certain behaviors, allowing them to assess and reflect on the importance of good morals (Berglund, 2021).

AR technology is expected to be one of the solutions to improve the quality of Islamic religious education, especially in moral learning. Along with the increasing use of technology in daily life, technology-based learning is also an inevitable need in the world of education (Afifah & Inayati, 2021). By integrating AR in moral learning, PAI can be more relevant to the context of the times, as well as strengthen the understanding and practice of moral values in students.

Although Augmented Reality (AR) technology has shown great potential in the field of education, its implementation in moral learning in Islamic Religious Education (PAI) is still rarely explored in depth. Many studies have focused on the use of AR in science or engineering subjects, but its application in religious education is still minimal. In the field of morality, teaching methods that are generally used tend to be conventional and have not utilized technological advances optimally. There have not been many studies that have shown how AR can be adapted to help students understand and internalize moral values in an interactive way.

Many unanswered challenges in the integration of AR into moral learning, including how to package moral and ethical values into a relevant and engaging format without compromising the essence of spirituality. AR offers the opportunity to create real-life simulations that allow students to learn from hands-on experiences, but how to design these experiences to be truly effective in moral learning is still a question mark. There is no clear guide on how to create AR content that is in accordance with the principles and values of Islam, especially to build students' character and morals.

The effectiveness of AR in moral learning is also still not widely researched empirically. In the field of religion, experience and internalization of values are often more important than mere knowledge, so the right approach must be really thought through. How this technology can lead students to not only understand, but also permeate and practice moral values, is still an open question. The lack of empirical research on the impact of AR on moral reinforcement makes educators and technology developers hesitant to adopt this technology in the context of religion (Chang et al., 2022).

In the realm of education, AR is generally applied to enrich visual content and clarify complex concepts, but its impact on moral values is still unclear. The use of technology in religious education invites debate, especially regarding how to maintain the integrity and values of religion when technology is adopted. Many educators are not yet convinced whether AR can truly support moral learning without compromising the spiritual depth that is important in religious education. The need to explore how these technologies can be designed to fit the context and goals of moral education is becoming increasingly urgent.

There is no framework or standard framework that can be a reference in designing AR-based moral learning. Most religious education institutions still rely on conventional methods due to limited resources and knowledge regarding AR technology. Technical challenges, such as the availability of devices and teachers' ability to operate them, are also obstacles. To overcome this gap, further research is needed to design a practical and effective AR-based moral learning model.

The integration of AR in moral learning still requires a careful approach and careful planning. The method used must consider aspects of spiritual education and ethics that are in accordance with the principles of Islam. Until now, many questions have not been answered about how AR technology can function as a tool that truly supports moral development.

The integration of Augmented Reality (AR) technology in moral learning in Islamic Religious Education offers an opportunity to enrich teaching methods that are more relevant to the times. Through AR, moral values can be conveyed in a more lively and interactive way, allowing students to understand the material through visual and participatory experiences. This technology has the potential to create a more immersive learning experience, where students not only hear or read, but also see and experience real-life scenarios that reflect moral principles.

The use of AR in moral learning can answer the need for more dynamic religious education, especially for the younger generation who are familiar with the digital world. By presenting realistic simulations, AR helps students understand the consequences of each action and motivates them to apply positive values in their daily lives. The technology allows students to learn through hands-on experience, an approach that is believed to be more effective in instilling moral and spiritual values compared to traditional methods that tend to be theoretical.

Through further research and development, it is hoped that AR can become an integral tool in moral learning, strengthening the understanding and application of moral values in real-life contexts. Building an AR-based moral learning system is not only relevant to the challenges of the times, but also important to ensure that religious education remains adaptive and effective.

RESEARCH METHODOLOGY

This study uses an experimental research design with a quantitative approach to measure the effectiveness of the use of Augmented Reality (AR) technology in moral learning in Islamic Religious Education (PAI) (Unaradjan, 2019). Through this design, the influence of AR technology on students' understanding and practice of moral values will be analyzed systematically and measurably. The experimental group will be given AR-based learning, while the control group will follow conventional learning methods. The results of the two groups will be compared to see the extent to which AR can contribute to improving students' moral understanding (Priadana & Sunarsi, 2021).

The population in this study is junior high school students who take Islamic Religious Education subjects in several schools in the city studied (Ewing, 2020). The sample was taken using a purposive sampling technique, with the criteria of students who have access and basic understanding of digital technology. The study involved two classes from each school as the experimental group and the control group, so that the total number of students involved in the study included about 100 students. A representative sample is expected to provide relevant and generalizable results (England, 2022).

The instruments used in this study include a written test to measure students' cognitive understanding of moral values and an attitude questionnaire to evaluate the internalization and application of morals in daily life. An additional instrument in the form of an in-depth interview was conducted to obtain qualitative data on students' perceptions of the use of AR in moral learning. The validity and reliability of the instrument have been tested before research is conducted to ensure the accuracy and consistency of the data obtained (Beste, 2019).

The research procedure begins with the preparation stage, namely the development of AR-based learning materials that are relevant to moral values in Islamic Religious Education. After the material was completed, students in the experimental group were given AR-based learning for several sessions, while the control group followed conventional learning. At the end of learning, both groups will be given the same tests and questionnaires to measure the understanding and internalization of moral values. The data collected was analyzed using descriptive and inferential statistics to assess the effectiveness of the use of AR in moral learning in PAI (Chen, 2020).

RESULT AND DISCUSSION

This study produced statistical data that illustrates the understanding and internalization of moral values in students who participate in AR-based learning as well as those who participate in conventional learning. The average score of students' moral understanding in the experimental group showed a significant increase after being given AR-based learning. In contrast, the control group that received only conventional learning methods showed lower improvement. Descriptive statistical data showed that the average score of the experimental group was in a higher score range than that of the control group, indicating a significant difference in the effectiveness of the learning method.

The table below shows the comparison of the average moral comprehension score between the experimental group and the control group before and after the intervention. In the table, it appears that the experimental group experienced a more significant increase in scores, indicating a positive impact of AR use on moral understanding. The average pre-learning scores for the experimental and control groups were 65.8 and 66.2, respectively, while after learning, the scores

increased to 85.4 for the experimental group and 74.5 for the control group. This data shows that there is a considerable positive influence of the AR method on students' moral understanding.

Group	Before Learning	After Learning
Experiment (AR)	65,8	85,4
Control (Conventional)	66,2	74,5

Table 1. Comparison of the average moral comprehension score between the experimental group and the control group

Secondary statistical analysis also supported these results, suggesting significant differences between the two groups in terms of scores of increased moral comprehension. The average increase in scores in the experimental group was higher than that of the control group, with a difference of 10.9 points. Secondary data obtained from literature review concluded that AR technology is effective in increasing the absorption of subject matter, especially in subjects that require in-depth understanding such as Islamic Religious Education.

A significant increase in the experimental group showed that AR helped students in understanding abstract concepts in moral learning. The use of AR-based simulations allows students to see first-hand examples of the application of moral values, which helps them more easily understand and remember the material being taught. Students who use AR reportedly feel more engaged in learning and more motivated to understand every moral concept taught.

The data obtained indicates that AR-based learning methods are able to improve students' memory. In the interviews conducted, most of the students in the experimental group admitted that the learning experience with AR made them feel more understanding and able to apply moral values in daily life. This student response was in line with statistical data that showed a significant improvement in the experimental group compared to the control group. From the interviews, it was also found that the use of AR encouraged them to be more active in the learning process.

The results of further analysis showed that students who received AR-based learning had better abilities in identifying and applying moral values compared to the control group. They tend to be able to explain certain situations by relating the concept of morality learned during learning. Based on this data, the integration of AR in moral learning has proven to be effective in building a deeper understanding of the values taught.

The data showed an increase in understanding of moral values in students who received AR-based learning, compared to those who received conventional learning. In several aspects, students in the experimental group are faster to understand and internalize moral material. The visual-based learning experience presented by AR helps students to visualize moral concepts in the context of daily life. This data is the basis that the AR method has a positive impact on improving moral learning.

The results of the trial showed that students who learned with AR experienced a more interactive experience, so they found it easier to relate moral material to their lives. The average students in the experimental group showed higher engagement during the learning sessions. When compared to the control group, students in the experimental group had better moral comprehension test results. This data was obtained through observation and analysis of the final test results of both groups.

The study also noted that students in the experimental group showed a more proactive attitude in discussing the application of moral values in the classroom. AR-based learning stimulates them to engage in simulated situations that depict good moral behavior. This data indicates that AR

technology not only improves understanding, but also stimulates students' desire to apply these values in their social interactions.

An analysis of data from the experimental group showed that AR plays an important role in creating immersive and meaningful learning experiences. The use of AR provides an opportunity for students to experience real-life situations related to moral values, making it easier for them to interpret each concept. Students can immediately feel the impact of each decision in the simulation, which helps them to develop a better understanding of the importance of morality in life.

From the interviews conducted, many students reported that learning with AR made them more aware of good and bad moral behavior. The data shows that the visual experience provided by AR is very helpful in shaping an understanding of the consequences of each behavior learned. The study found that AR not only makes learning more engaging but also more effective in creating a deep impression on students.

The relationship between moral understanding data and the use of AR technology showed a positive correlation, where students who studied with AR showed a stronger understanding and internalization of moral values. Data analysis shows that AR helps students to understand the concept of morality in a real-life context, making learning more meaningful and applicable.

In this case study, the implementation of Augmented Reality (AR) technology was carried out in a junior high school that has a structured Islamic Religious Education (PAI) program. The class that was the subject of the study consisted of 30 students who received moral learning using an AR application specifically designed to display moral scenarios in daily life. The app presents interactive simulations where students can explore various social situations that require decision-making based on Islamic moral values. Direct observation was carried out to observe how students responded and engaged in the simulation.

During AR-based learning, students seem to be more active and enthusiastic in understanding moral material compared to conventional methods. Data from these case studies show that students often discuss with each other about the best choices to make in a given simulation. Additionally, interaction with AR apps provides students with a better contextual understanding of how moral values are applied in real-life situations. The results of these observations show that AR technology is able to create a more lively and relevant learning environment for students.

Based on the test results after the learning session, the average score of students' moral understanding in this case study has increased significantly. Many students were able to explain the reasons behind the ethical choices they made during the simulation, demonstrating a deep understanding of the material being taught. This increase in scores strengthens the finding that AR-based learning methods are effective in helping students internalize moral values in more depth compared to traditional learning methods.

From the case study, it can be seen that the use of AR makes the learning process more real and contextual for students, so that moral values are easier to understand and apply. AR applications used in simulations allow students to experience scenarios they might encounter in real life, making moral learning more relevant to their daily experiences. The observation results showed that the learning experience with AR increased student engagement, as they felt as if they were in a real situation that required decision-making.

The use of AR in moral learning is also seen to be able to encourage self-reflection in students. Many students who, after using AR apps, stated that they better understand the importance of morals and the impact of their behavior on others. These results indicate that AR not only helps students understand concepts, but also encourages the internalization of those values in the form of

personal reflection. Based on post-learning interviews, some students even admitted that they tried harder to apply the moral values they learned in their daily lives.

The increase in moral comprehension scores seen in the test results shows that AR-based learning experiences have a significant impact. Students in the experimental group, who used AR, showed higher scores compared to the control group that learned through conventional methods. These findings reinforce the hypothesis that AR-based learning is effective in increasing the understanding and application of moral values among students.

The relationship between the use of AR and students' understanding of moral values can be seen from the positive correlation between AR-based learning outcomes and increased understanding and internalization of morals. The data shows that students who learn with AR are better able to understand and explain moral concepts in a more real context. The increase in moral comprehension scores in the experimental group showed a significant relationship between AR-based learning and the strengthening of students' moral values. AR serves as a tool that not only helps students to understand concepts, but also to apply them in real life.

Interaction with AR technology helps students to see the impact of the ethical decisions they make in the simulation, which ultimately strengthens their understanding of the importance of morality. The hands-on experience presented by AR provides an opportunity for students to learn through trial and error in a safe environment, where they can understand the consequences of every choice they make. This helps students to internalize moral values more deeply, because they feel the effects of these behaviors themselves.

The use of AR also encourages collaborative learning, where students can share experiences and discuss ethical choices they made during simulations. This interaction between students enriches the learning process and adds to their perspective on the application of moral values in social situations. Collaboration in an AR-based environment helps students to see a variety of viewpoints, which can support their understanding of the complexities of moral values.

The findings of this study underline that AR has great potential as an effective learning tool in Islamic Religious Education, especially in the field of morality. The positive relationship between the use of AR and the improvement of understanding and internalization of morals in students is a strong foundation to recommend the implementation of this technology more widely in the educational environment.

The results of this study show that the integration of Augmented Reality (AR) technology in moral learning in Islamic Religious Education (PAI) has a significant positive effect. Students who learn with the help of AR experience an increase in understanding and internalization of moral values compared to groups that use conventional methods. Quantitative data from the test results showed significant differences between the experimental group and the control group, with the experimental group showing higher moral comprehension scores. AR-based learning experiences also add to students' engagement in learning, which can be seen from their enthusiasm and active interaction during the learning process.

Direct observation reveals that AR is able to present simulated situations that are relevant to real life, so that students can learn through contextual experiences. Through AR-based simulations, students are able to feel the impact of the ethical decisions they take in the scenarios presented, which indirectly strengthens the internalization of their moral values. The results of the interviews also confirmed that many students felt more motivated to apply the moral values learned outside the classroom. All of these findings support the hypothesis that the use of AR can increase the effectiveness of moral learning in PAI.

The increase in students' comprehension scores and involvement in moral learning indicates that AR is not only a visual aid, but also a learning method that is able to facilitate a deep understanding of ethical and moral concepts. Interactive simulations presented through AR have successfully facilitated a more personalized and in-depth learning experience. This increased understanding shows that technology can be a solution to present a more relevant and effective approach to religious learning, especially in the midst of a generation that is increasingly familiar with digital technology.

This research is in line with several previous studies that have found that AR technology is effective in improving student understanding and engagement in various subjects, especially those that require visual and contextual experiences. Several studies conducted on science and history subjects have also shown that AR can help students remember information better because of the interactive visual experience. Other research also highlights that AR technology is able to enrich learning on abstract topics, similar to moral concepts that often require in-depth appreciation. This equation indicates that the potential of AR in education is indeed relevant for a wider field, including religious education.

Unlike other studies that focus on exact subjects, this study shows that AR has special potential in moral and ethical learning. In religious education, moral values are often considered abstract and difficult to apply in daily life by students, so AR technology can be a bridge that helps students understand and apply these values more realistically. Another study focusing on character education revealed that interactive and contextual learning experiences can help students better understand the impact of their behavior, supporting results similar to this study.

The main difference between this study and some previous studies is in the context of religion, where AR-based learning plays a role in helping students absorb spiritual values. In religious education, the understanding of moral values does not only stop at the cognitive level but also involves affective aspects. In contrast to scientific research, these results show that AR has great potential in supporting holistic learning, where students not only understand, but also live and apply the values taught.

The results of this research are a sign that technology can have a positive impact in the realm of religious learning, especially in facilitating the understanding and practice of moral values. By using AR, Islamic religious education has the opportunity to increase its relevance and attractiveness in the eyes of students living in the digital era. This shows that creative and innovative methods of religious teaching can be more effective in instilling the moral values needed by the younger generation. The application of technology in religious learning opens up new insights into how spirituality and technology can go hand in hand without compromising the meaning or essence of the values taught.

The results of this study also provide indications that schools and religious education institutions need to consider integrating technology as part of their curriculum. The integration of technology such as AR in moral learning not only has an impact on improving student understanding, but also creates a more interesting and meaningful learning environment. These findings can be a reference for educators and policymakers to see technology as a tool that supports character education, not just an additional tool. AR technology, if applied correctly, has the potential to support higher learning goals, such as building noble character in students.

These results are a signal that the conventional approach in religious education may need to be updated with methods that are more adaptive to the development of the times. With the integration of technology such as AR, the teaching and learning process has become more adaptive to the learning styles of modern students, which tend to be visual and interactive. The use of AR in

religious education shows that spirituality and technology do not need to contradict each other, but can complement each other to achieve deeper educational goals.

The results of this study indicate that Augmented Reality (AR) technology has significant potential in improving the quality of moral learning in Islamic Religious Education (PAI). With these results, AR integration can be an effective solution to bridge the gap between traditional learning and the needs of modern students who are more familiar with digital technology. The application of AR in religious learning not only provides cognitive understanding, but also helps students internalize moral values more deeply. This implication indicates that technology can be a transformational tool in religious education, making moral learning more relevant, interactive, and meaningful for students.

The use of AR in moral learning allows religious education institutions to innovate in teaching methods. This technology can enrich students' learning experience and help them understand the real application of moral values in everyday life. Another implication of these results is the need for institutional support to provide technological facilities such as AR devices and training for teachers, so that their implementation can run well. Thus, this technological innovation can be adopted more widely and effectively in the religious education environment.

The results of this study also imply the need to update the religious education curriculum, especially in the moral aspect, to be more adaptive to technological developments. The integration of technology in the curriculum allows for a more dynamic and contextual approach to teaching, adapting to the needs and characteristics of the digital generation of students. This implication can encourage religious schools to start designing a curriculum that aligns moral values with cutting-edge technological approaches, so that religious education can have a more significant influence on students' lives.

The results of the study that show an increase in understanding and internalization of moral values in students in the experimental group can be explained by the interactive and immersive nature of AR technology. AR allows students to engage directly in the simulation of real-life situations, so they can understand the impact of each decision and behavior. This more personalized learning experience encourages students to better understand the meaning and value of each moral concept taught. AR interactivity makes students more active in participating, different from conventional methods that tend to be passive.

The use of AR in moral learning allows students to visually see how moral principles are applied in everyday situations. This visual experience has a stronger impact compared to traditional learning methods which are often theoretical and abstract. By visualizing realistic social situations, students can see for themselves the consequences of both good and bad behavior, which helps them to reflect and internalize those moral values. This factor is most likely the reason why AR shows positive results in the context of moral learning.

The next step of this research is to develop an AR-based moral learning model that can be applied more widely in Islamic Religious Education. The development of this model involves the design of AR content that is tailored to the desired moral values, as well as an effective evaluation method to measure the level of internalization of these values. With a more structured model, the implementation of AR in moral learning can be done in a systematic and consistent manner, allowing for more precise measurement of the impact on students' understanding and attitudes.

CONCLUSION

The most important finding of this study is the effectiveness of Augmented Reality (AR) technology in increasing the understanding and internalization of moral values in students in

Islamic Religious Education (PAI). Students who use AR show a significant improvement in moral understanding as well as show a higher level of engagement during learning, compared to students who follow conventional methods. The learning experiences presented by AR provide realistic and visual context, helping students to not only understand concepts, but also live and apply them in real life.

This research makes a significant contribution in enriching the concept and method of moral learning with a technology-based approach. The integration of AR in moral learning offers alternative methods that are more relevant to the digital generation, opening up new opportunities for innovation in religious education. The limitations of this study lie in the limited sample coverage and the use of AR which is still in the early stages of development, so the results may not be fully representative. Further research can be focused on the development of broader and more in-depth AR content and the long-term evaluation of the impact of this technology on the practice of students' moral values.

AUTHORS' CONTRIBUTION

Author 1: Conceptualization; Project administration; Validation; Writing - review and editing.

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