The Use of Augmented Reality in Teaching Islamic History to Millennial Students

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ARTICLE INFO	ABSTRACT
	This study aims to examine the effectiveness of using Augmented Reality (AR) technology in teaching Islamic history to millennial generation students. The background of the study is based on the low interest and involvement of students in teaching Islamic history delivered conventionally. Using a quantitative approach through a quasi-experimental design, students were divided into two groups: the experimental group used AR media, while the control group used traditional learning methods. Data were collected through comprehension tests, learning motivation questionnaires, and observations of student involvement. The results showed that the use of AR significantly improved students' cognitive understanding, motivation, and involvement in the learning process. AR allows visualization of historical events in three dimensions and interactively, making learning more contextual, interesting, and enjoyable. This study concludes that AR is an effective learning medium for teaching Islamic history in the digital era. These findings are expected to be a reference for educators in designing innovative technology-based learning strategies.

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1. INTRODUCTION

In this increasingly advanced digital era, the development of information technology has had a significant impact on various aspects of life, including the field of education **(Susanto, 2024).** One of the technologies that is developing rapidly and offers great potential in learning is Augmented Reality (AR). In general, AR is a technology that combines the real world with virtual objects in real-time, creating a more interactive and immersive learning experience. General facts show that the use of digital technology in education is increasingly in demand, especially by the millennial generation who grew up with technological advances and are very familiar with various digital devices **(Kamal, Firmansyah,**

Rafiah, Rahmawan, & Rejito, 2020). The millennial generation as an age group that now dominates the educational environment has unique characteristics, such as a preference for interactive, visual, and practical learning. This requires an innovative learning approach so that the material can be delivered effectively and attract their attention.

In the context of learning Islamic history, especially for the millennial generation, there are social facts that show that history material tends to be seen as a boring and less interesting lesson **(Herdiyanti, Janah, & Susanto, 2025).** Many students find it difficult to connect past historical events with their current lives, resulting in apathy and low interest in learning history. In addition, the traditional learning approach that is still dominant in the form of lectures and memorization is often considered less effective in creating deep understanding and emotional involvement of students in Islamic history material **(Sembiring, Ilham, Sukmawati, & Arifudin, 2024).** This problem certainly has implications for the low quality of understanding of Islamic history among the younger generation, even though this understanding is important as a foundation for building a strong Islamic and national identity.

These problems invite attention to find learning solutions that can increase the appeal and effectiveness of learning Islamic history. One solution that emerged is the use of Augmented Reality technology as a learning medium. With AR, students can see visualizations of historical events, figures, and artifacts in three dimensions that can be interacted with directly through digital devices such as smartphones or tablets. This technology allows for a more enjoyable and easy-to-understand learning experience, because students not only hear or read, but can also "feel" the atmosphere and historical context in real terms. The implementation of AR is expected to increase learning motivation, conceptual understanding, and active involvement of students in learning Islamic history.

Several previous studies have examined the use of AR in education in general and in the context of history learning. These studies show that the use of AR can increase learning interest, facilitate understanding of material, and increase information retention in students. For example, Ahmad and Hasan's research **(Ahmad Hasni & Hasan, 2022)** stated that AR helps students understand abstract concepts through real visualization, while other research by Soleh et al. **(Sholeh, Triyono, Haryani, & Fatkhiyah, 2021)** asserts that AR creates a more contextual and immersive learning environment. However, there is still limited research that specifically examines the use of AR in teaching Islamic history for the millennial generation, especially in the context of formal education in countries with a

Muslim majority population. Therefore, this study aims to fill this gap by examining the effectiveness of using AR in teaching Islamic history to millennial students.

The main objective of this study is to identify the extent to which AR technology can improve the motivation, understanding, and engagement of millennial students in learning Islamic history. The study also aims to explore how AR can be a learning medium that is able to overcome the weaknesses of conventional methods and adapt to the learning characteristics of the millennial generation which are more visual and interactive. With this objective, this study is expected to provide a real contribution to the development of a more innovative and effective Islamic history learning model in the digital era. The urgency of this research is very high considering the urgent need to update the Islamic history learning method to be more relevant to the development of the times and the needs of the current generation. Islamic history education that is able to attract interest and build deep understanding will also contribute to the formation of strong Islamic character and identity among the younger generation, while maintaining the sustainability of Islamic historical and cultural values. On the other hand, the ever-evolving AR technology provides a great opportunity to transform learning that has so far been considered rigid and monotonous into more dynamic and enjoyable. Therefore, combining AR with Islamic history learning is a very appropriate strategic step to support the quality of education in the modern era.

The method used in this research is a quantitative approach with experimental design, **(Sugiyono, 2016)** where the millennial student group will be given Islamic history learning using AR media, then compared with the control group using conventional learning methods. Data was collected through comprehension tests, learning motivation questionnaires, and observations of student involvement during the learning process **(Sugiyono, 2015).** Data analysis was conducted statistically to measure the effectiveness of using AR in improving student learning outcomes and motivation. This approach was chosen so that the research results could provide strong empirical evidence regarding the impact of AR in learning Islamic history.

The novelty of this research lies in its focus on integrating Augmented Reality technology specifically into Islamic history learning for the millennial generation. In addition, this research also adjusts AR content and methods to the characteristics and learning needs of the millennial generation which are very different from the previous generation. This research not only sees AR as a

technological tool, but also examines how the technology can be adapted pedagogically to optimize the process of learning Islamic history. Thus, the results of this study are expected to be a new reference for educators, curriculum developers, and educational policy makers in implementing AR technology effectively and contextually in the field of Islamic history studies.

Overall, this background shows that the integration of Augmented Reality technology in Islamic history learning is a very relevant and important innovation to answer the challenges of education in the millennial era. By utilizing this sophisticated technology, it is hoped that the millennial generation can have a more meaningful, enjoyable, and effective learning experience, so that they can understand Islamic history better and apply these values in everyday life. This research is present as an initial step in exploring the potential of AR as an educational technology solution that bridges the gap between the needs of the younger generation and the demands of rich and complex Islamic history learning materials.

2. METHODS

The research method used in this study adopts a quantitative approach with a quasi-experimental design to test the effectiveness of using Augmented Reality (AR) technology in teaching Islamic history to millennial generation students **(Sugiyono, 2016).** The selection of this experimental design aims to compare the learning outcomes and learning motivation of students who use AR learning media with students who use conventional methods. The study population consisted of millennial students who are studying at the high school level or equivalent, who were selected because they are an age group that is very familiar with digital technology and are the main target for AR implementation in learning. The research sample was taken using a purposive sampling technique by considering the criteria of technological readiness and the willingness of schools and students to participate in the study. The sample was divided into two groups, namely the experimental group that received Islamic history learning with AR media and the control group that received learning with traditional methods, such as lectures and discussions. The data collection process was carried out through several instruments. First, a test of understanding Islamic history material was used to measure the level of mastery of historical concepts and information after participating in learning. This test is arranged in the form of multiple choices and essays to obtain a comprehensive picture of students' cognitive abilities. Second, a learning motivation

questionnaire was used to assess the level of interest, enthusiasm, and emotional involvement of students in the learning material. This questionnaire was designed based on the theory of learning motivation and adjusted to the context of using AR technology. Third, observations were made during the learning process to directly observe student behavior, interactions, and involvement. This observation was carried out using an observation sheet that focused on aspects of student activity, media use, and responses to the learning methods applied.

The implementation of learning in the experimental group uses an AR application that has been developed specifically for Islamic history material. This application contains three-dimensional visualizations of historical events, important figures, and artifacts that can be accessed via smartphone or tablet devices **(Rahmatullah, 2021).** The use of AR in the learning process is carried out in a guided manner by the teacher during several learning meetings so that students can understand how to use the media and optimize the learning experience. Meanwhile, the control group follows learning with conventional methods that are commonly applied in schools, without the help of AR technology. During the implementation, both groups are given the same learning time and duration so that the results obtained can be compared validly. Data analysis was carried out using inferential statistical techniques to test the research hypothesis. Data from the results of the understanding test were analyzed using the t-test to compare the average values between the experimental and control groups, so that it can be seen whether the use of AR provides a significant difference in understanding Islamic history material. Learning motivation data were analyzed using descriptive and inferential statistical tests to see changes in student motivation levels after learning using AR. In addition, the results of observations were analyzed qualitatively to provide a more in-depth picture of the dynamics of learning and student responses to the use of AR technology. The use of data triangulation from various instruments aims to increase the validity and reliability of the research results.

In this research process, the researcher also paid attention to research ethics by asking for permission and approval from the school, teachers, and students who were respondents. The data collected was kept confidential and used only for academic purposes. The researcher also ensured that the use of AR did not cause excessive burden for students and that the media used was safe and in accordance with applicable learning standards. With this systematic and structured research method, it is hoped that valid empirical evidence can be

obtained regarding the effect of the use of Augmented Reality in improving understanding and motivation to learn Islamic history in the millennial generation. Overall, the research method applied not only assesses the cognitive aspect through test results, but also pays attention to the affective aspect through student motivation and involvement. This approach provides a comprehensive picture of how AR technology contributes to the quality of Islamic history learning. Through a carefully designed method, this research will make a significant contribution to the development of innovative learning models that are in accordance with the needs and characteristics of the millennial generation in today's digital era.

3. FINDINGS AND DISCUSSION

The Effectiveness of Using Augmented Reality in Improving Understanding of Islamic History in Millennial Students

Learning Islamic history is one of the important materials in the education curriculum, especially for high school students who are beginning to understand the role of historical events and figures in religious and socio-cultural contexts **(Susanto, Yahuda, Basuki, & Kadir, 2023)**. However, so far the methods of learning Islamic history that are widely used tend to be conventional, such as lectures, reading texts, and class discussions, which often make students feel less interested and have difficulty understanding abstract and chronological material content. In the context of the millennial generation, which is known to be very familiar and dependent on digital technology, an innovative and interactive learning approach is needed so that historical material can be understood better and more interestingly. This study uses Augmented Reality (AR) media as a learning solution that can overcome the limitations of traditional methods. AR provides an immersive and interactive learning experience through three-dimensional visualizations, animations, and additional information that appears in real time when the user points the device at a particular object. With these features, it is hoped that students can capture the context of Islamic history more clearly and concretely, as well as improve their memory and understanding of the material.

The quasi-experimental method used divided millennial students into two groups, namely the experimental group that learned using AR media and the control group that learned using conventional methods **(Rizal, Fari Katul Fikriah, & Husni Hidayat, 2023).** The measurement of material understanding was carried out through a written test consisting of multiple-choice questions

and essays designed to test mastery of concepts, chronology, figures, and important events in Islamic history. The test results were then analyzed using a t-test to see if there were any significant differences between the two groups. The results showed that the experimental group using AR obtained an average material understanding score of 85.7, while the control group learning conventionally only obtained an average of 70.3. Statistical analysis using the t-test produced a p value <0.05, indicating that the difference was statistically significant. In other words, the use of AR significantly improved students' understanding of Islamic history compared to traditional learning methods. This finding is in line with various literatures showing that interactive technology-based learning such as AR can improve cognitive abilities and understanding of complex concepts.

One of the main reasons for the effectiveness of AR in learning Islamic history is its ability to present three-dimensional visualizations of historical events and figures that students could previously only imagine abstractly **(Hermawan & Hadi, 2024).** For example, through the AR application, students can see a 3D model of the Prophet's Mosque or the Battle of Badr visually, and can even observe various historical artifacts displayed in detail and animation. This visualization provides a more concrete learning experience, making it easier for students to understand the context and chronology of history. This is in accordance with cognitive learning theory which states that visualization can help process information more effectively in long-term memory. In addition, AR interactivity allows students to play an active role in the learning process, not just as passive recipients of information. In the AR application, students can move objects, enlarge details, or browse additional information that appears according to their needs. This feature increases curiosity and cognitive engagement that play an important role in the learning process. This active involvement triggers a process of elaboration and deep reflection, making the material easier to digest and remember. Research by Wu et al. (2013) supports that the use of AR increases motivation and learning engagement, which leads to improved academic outcomes.

In addition to the cognitive aspect, the use of AR is also able to overcome obstacles in learning history that often occur, such as difficulties in understanding the sequence of time and interrelated events, as well as the limitations of students' imagination in imagining situations and atmospheres of the past **(Susanto, Ali, & Hidayat, 2024)**. With AR, chronological sequences can be visualized interactively, for example through a moving time map or timeline

that can be accessed directly by students. This helps students understand the cause and effect of historical events and see the relationships between figures and their social impacts more clearly.

However, the study also noted several things that need to be considered in the implementation of AR. The use of this media requires adequate devices and technical readiness from schools and students. Some students initially need adaptation time to operate the AR application smoothly. Therefore, teacher assistance during the learning process is very important to ensure that all students can utilize this technology optimally. In addition, AR content must be designed properly so that it is not confusing or too complex, and is always relevant to the objectives of learning Islamic history that are to be achieved. Overall, the findings of this study provide strong empirical evidence that the use of Augmented Reality in learning Islamic history is very effective in improving the understanding of millennial students. AR media not only improves cognitive aspects, but also provides a more interesting learning experience and motivates students to actively learn. With the increasing development of digital technology, the integration of AR in the history learning curriculum is a strategic step that needs to be further developed in order to answer the challenges of education in the digital era **(Rizal et al., 2023)**.

This study also adds to the literature that emphasizes the role of AR technology as an innovative and relevant learning medium for the millennial generation. It is hoped that the results of this study can be a reference for educators and curriculum developers in designing more effective and enjoyable history learning strategies by utilizing the latest technology. In addition, this study opens up opportunities for further research to explore the influence of AR on other aspects such as critical historical analysis skills, student creativity, and collaborative learning.

The Influence of Augmented Reality Media on Millennial Students' Motivation and Learning Engagement

In the context of learning Islamic history, the main challenge often faced by teachers is the low motivation and involvement of students. This is especially felt by the millennial generation who live in a world that is very close to technology and digital information **(Romdhoni & Anam, 2025)**. They tend to get bored easily with conventional learning methods such as lectures and writing on the board. History, as a subject rich in events, figures, and socio-cultural contexts, is often considered boring by students because it is narrative and abstract. Therefore, a new approach is needed that can change the learning

atmosphere to be more interesting, dynamic, and participatory. One of the innovations being developed is the use of Augmented Reality (AR) technology in the learning process. AR is able to present historical objects, places of events, and important figures in three-dimensional (3D) form that can be accessed via digital devices such as smartphones or tablets. With an interactive and visual learning experience, AR is believed to be able to increase student motivation and involvement in learning Islamic history.

This study uses a quantitative approach with a quasi-experimental design. The subjects of the study consisted of two grade XI classes at one of the Madrasah Aliyah in East Java. The first class consisted of 30 students as an experimental group using AR media in learning Islamic history, and the second class consisted of 30 other students as a control group using conventional lecture and discussion methods **(Munawaroh, Widiyani, & ..., 2022)**. To measure motivation and learning engagement, the researcher used an instrument in the form of a Likert scale questionnaire with 25 statements that had been tested for validity and reliability (Cronbach's Alpha value of 0.89 indicates a very high level of reliability). Before the treatment (pre-test), both groups filled out the motivation and learning engagement questionnaire. The average learning motivation score of the experimental group was 65.4, while the control group was 64.8, which shows that the initial conditions of the two groups were almost the same. After the learning process had lasted for four meetings (2 weeks), both groups filled out the same questionnaire again (post-test).

The post-test results showed a significant increase in motivation and learning engagement in the experimental group. The average score of the experimental group increased to 84.7, while the control group only reached 70.1. Statistical tests using independent sample t-test showed a p value = 0.000 <0.05, which means there is a significant difference between the two groups. Thus, the use of AR media has been proven to quantitatively increase student motivation and engagement in learning Islamic history. Qualitatively, during the learning process with AR, researchers also conducted direct observations of student behavior in class. In the experimental group, students showed high enthusiasm when pointing their devices at printed media equipped with AR markers. They were seen actively asking questions, discussing, and even scrambling to try features such as zooming in on historical artifacts or playing battle simulations in Islamic history. The classroom atmosphere became more lively, collaborative, and full of curiosity. In contrast, in the control group, although learning went

smoothly, there was not much interaction. Some students looked passive and only took notes without asking many questions or participating.

The main features in AR media that have a big influence on motivation include visualization capabilities, interactivity, and real-time impressions **(Fikri & Hastuti, 2022).** Students feel as if they are "directly" in the historical events being studied, for example, exploring the market in the city of Medina during the time of the Prophet or watching a simulation of the Hijrah to Habsyah. This gives them a unique and different learning experience from the usual, which ultimately encourages curiosity and an intrinsic drive to understand further. This finding confirms the results of previous research by Nabila et al., **(Nabila Putri Wahiddiyah, Ayudhia Nur Luthfia, Desy Safitri, & Sujarwo Sujarwo, 2023)** which states that AR can increase learning motivation through the presentation of interesting and contextual information. In addition, high motivation and involvement also strengthen memory retention and long-term understanding of learning materials **(Junaidi, Sileuw, & Faisal, 2023).**

However, researchers also noted that the use of AR was not entirely without obstacles. Some students initially experienced technical difficulties in operating the application, such as difficulty reading markers or slow device connections. This requires adaptation and guidance from teachers. Therefore, it is important for educational institutions to ensure the readiness of devices and training in optimal use of AR applications before being widely implemented. Overall, this study shows that Augmented Reality media has a significant influence in increasing the motivation and learning engagement of millennial students. This is evidence that technology-based learning not only provides added value in terms of cognitive understanding, but also has an impact on the affective aspects and learning behavior of students. Amid the challenges of the digital era, the use of AR in education is a strategy worth considering in creating a more contextual, enjoyable, and meaningful learning process.

Implementation and Challenges of Using Augmented Reality in Islamic History Learning in Secondary Schools

The implementation of Augmented Reality (AR) technology in Islamic history learning in secondary schools marks an innovative step in responding to the challenges of the digital age. AR is able to present material that was previously only available in narrative and text form into an interactive 3D visual form. In the context of Islamic history learning, this includes the reconstruction of important events such as the Battle of Badr, the Treaty of Hudaibiyah, or the construction of the Prophet's Mosque, which are visualized in a real and

immersive way **(Susanto & Nuhaa, 2024)**. The implementation of the implementation in this study was carried out in class XI Madrasah Aliyah for four meetings. The teacher acts as a facilitator, while AR media is used through an application that has been programmed to display certain historical objects when the marker (visual marker) is scanned with a smartphone camera. This process begins with an introduction to the application to students, followed by a demonstration of its use, and then continued with AR-based learning activities combined with group discussions.

The students welcomed this approach positively. They felt more enthusiastic in participating in learning, especially because the material that was previously considered abstract became easier to understand **(Susanto et al., 2023).** Visualizations such as animations of troop movements in battle or the structure of historical buildings help students understand the context of events more concretely. In addition, the interactivity of the application makes students feel more involved, not just passive recipients of information, but also actively exploring the material. However, in the implementation process, several challenges were found that cannot be ignored. The first is technical constraints. Not all students have devices that are compatible with AR applications. Some phones have limitations in terms of RAM, camera, or operating system version. This causes some students to be unable to access AR features optimally **(Fiaji, Brata, & Zulvarina, 2021).** Schools that do not yet have adequate technological facilities also face obstacles in providing supporting devices collectively.

The second challenge is teacher readiness. Although history teachers have good pedagogical competence, not all have sufficient technological skills to manage AR media optimally. Training and technical assistance are urgently needed so that teachers are able to integrate AR into their learning strategies. Third, limited internet infrastructure is a significant obstacle, especially in schools located in areas with unstable network connections. Some AR applications require an active connection to download data or run certain features. As a result, the learning process can be disrupted if the internet signal is weak.

However, this challenge is not a major obstacle, but rather an important evaluation material for schools, governments, and educational technology developers. Solutions can be sought through the provision of offline-based AR applications, procurement of devices in schools through BOS or CSR, and regular teacher training. With the right implementation strategy and adequate infrastructure support, AR has great potential as an effective and relevant

Islamic history learning medium for the millennial generation. The use of AR is not just an innovation, but a need to adapt the world of education to the digital-native learning style of today's students.

4. CONCLUSION

This study shows that the use of Augmented Reality media in learning Islamic history has proven effective in increasing cognitive understanding, motivation, and engagement of millennial generation students. AR media presents historical materials visually and interactively that can bridge the gap between students' digital-native learning styles and traditional learning approaches that have dominated so far. The results of tests and observations prove that students who learn with the help of AR are more active, enthusiastic, and have a deeper understanding of the material. However, the success of AR implementation is also influenced by supporting factors such as the availability of devices, technical readiness of teachers, and technological infrastructure in schools. Thus, AR not only offers technological solutions, but also demands systemic readiness in the world of education. Further research can expand the focus not only on understanding and motivation, but also on the development of critical thinking skills, collaboration, and historical analysis skills through AR media.

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