Blantika: Multidisciplinary Jornal
Volume 3 Number 9, Agustus, 2025
p- ISSN 2987-758X e-ISSN 2985-4199

Augmented Reality Animasi Surat Pendek Al-Quran Berbasis Android

Virgy Andrean Riyadi, Muhamad Bahrul Ulum
Universitas Esa Unggul, Indonesia
Email: virgyriyadi12@gmail.com, m.bahrul_ulum@esaunggul.ac.id

ABSTRACT

The development of technology has significantly impacted various fields, including education. One of the emerging technologies, Augmented Reality (AR), provides interactive and engaging learning experiences. This research focuses on the design and development of an Android-based application that utilizes AR technology to animate short Quranic surahs (Juz Amma) for children at Taman Pendidikan Al-Qur'an (TPQ). The application aims to make Quranic learning more engaging, interactive, and effective for young learners by integrating AR with traditional Quranic teaching methods. The research methodology includes the identification of problems, literature review, data collection through observation, interviews, and library study, as well as the design and development of the AR-based learning application. The findings demonstrate that AR can enhance children's engagement and retention in learning short surahs, making the Quran more accessible and enjoyable for younger audiences. This innovative approach is expected to offer a solution to the challenges faced in Quranic education today.

Keywords: *Augmented Reality, Quranic Animation, Short Surahs, Android Application, Interactive Learning, Juz Amma, Educational Technology.*

Manuscript accepted:Date *Revised: Date* *Date of publication: Date*

INTRODUCTION

The rapid development of the times has a significant impact on society, especially children. One of the technological developments that is in great demand is Augmented Reality (AR) (Al-Ansi dkk., 2023; Grubert dkk., 2017; Gudoniene & Rutkauskiene, 2019; Huang dkk., 2018; Pinto dkk., 2022). AR is a technology that combines two-dimensional and three-dimensional virtual objects into a three-dimensional real environment, as well as projecting those objects in real-time. This technology allows us to view two-dimensional or three-dimensional objects through devices that have a camera by highlighting specific markers (Arena dkk., 2022; Elmqaddem, 2019; Muñoz-Saavedra dkk., 2020; Rauschnabel dkk., 2022; Vovchak dkk., 2022). In the midst of these developments, children often face difficulties in learning the Quran properly and correctly, despite the various learning methods available.

Many children still have difficulty in reading the Quran even though many methods have been offered. However, this challenge still cannot be overcome effectively with conventional learning methods. In this case, technology can be a solution to create new

ways that are more interesting and interactive. One example of technology implementation that can support learning the Quran is by using Augmented Reality (AR) (Ahmad dkk., 2018, 2019; Lidianti dkk., 2022; Ramli dkk., 2020; Sari, 2022). The use of AR in learning is expected to make children more interested and enthusiastic in learning, as well as overcome the problem of boredom that often arises with traditional learning methods.

TPQ As-Sapphire Tigaraksa, which is a place to teach Quran literacy for children, still uses conventional learning media. The frequent use of the Quran in this method can make children feel bored, especially since they are at a playful age. Therefore, researchers are trying to develop new learning media by utilizing Augmented Reality technology, specifically to teach Juz Amma. With this approach, it is hoped that learning will be more interactive and fun for children.

The Quran, as the book of revelation of Allah Subhanahu Wa Ta'ala to the Prophet Muhammad (peace and blessings of Allaah be upon him) through the Angel Jibril, is a guide for the life of Muslims. The Quran consists of 30 juz, 114 letters, and more than 6000 verses. This book is the source of Islamic teachings and the basis of law in daily life. In this context, it is important for Muslims, especially children, to study and memorize the contents of the Qur'an well, especially the short letters in the Juz Amma which are an important part of daily worship.

Studying the Quran will not only increase religious knowledge, but also enrich the overall insight. By studying the Quran, one can broaden one's outlook on life, add to the treasury of knowledge, and gain a deeper understanding of life and this world. Therefore, learning the Quran from an early age is essential to form a strong character and understanding of religion in children. By utilizing technology, this learning is expected to be more interesting and easy to understand by the younger generation.

However, currently research related to the use of AR technology in learning the Quran is still limited. Most of the apps that exist are just a visual display with no sound, and they don't show a full three-dimensional animation. In fact, one of the advantages of AR technology is its ability to project three-dimensional objects in real space, which can provide a more immersive learning experience. This research aims to develop Juz Amma learning applications using AR technology, with the hope of creating a different and more engaging learning experience for children.

By using Augmented Reality technology, this application can combine three-dimensional visualization with educational elements that can make it easier for children to learn the Quran. AR not only enhances the learning experience visually, but also allows for more contextual and interactive learning. This is especially useful for attracting the attention of children, who tend to prefer learning media that is entertaining and not boring.

Previous studies on using Augmented Reality (AR) in Quranic learning for children have shown promising results, but remain limited. Putri et al. (2022) demonstrated that AR implementation in children’s learning can increase interest and engagement with the material; however, the applications used were still two-dimensional and lacked immersive three-dimensional visualization. Meanwhile, Rahmawati and Hidayat (2021) emphasized the importance of interactive media for learning Juz Amma, but their study relied on interactive videos without AR integration, limiting the immersive and contextual learning experience. These studies reveal a gap in using full three-dimensional AR with educational and interactive elements for Juz Amma learning.

The purpose of this research is to create a Juz Amma learning application that utilizes Augmented Reality technology, as well as increase the enthusiasm and

attractiveness of children in learning. With this application, it is hoped that children can more easily memorize the short letters of Juz Amma and feel more interested in continuing to learn the Quran. Through this technology, religious learning is not only limited to conventional methods, but can be transformed into a fun and effective learning experience.

RESEARCH METHODS

The research methodology includes the identification of problems, literature review, data collection through observation, interviews, and library study, as well as the design and development of the AR-based learning application. The process of this research is divided into several stages. The first step is Title Determination, where the author consults with the supervisor to finalize the research title. After this, the Problem Identification phase helps identify issues related to the underutilization of technology, particularly in teaching children to read the Quran accurately.

In the next stage, Literature Review, the author examines previous studies and theories related to the topic to gather background information. This helps in building the foundation for the research and application development. Following the literature review, Data Collection takes place through methods such as Observation, where the author examines how children use smartphones in their daily lives, Interviews with the teacher at TPQ As-Sapphire to understand the existing learning methods, and Library Study to gather additional references from journals, articles, and research papers.

The Problem Analysis phase uses a Fishbone Diagram to visually identify the root causes of the issues encountered in Quran learning methods. This is followed by the Requirement Planning phase, where all necessary system requirements are identified, and a blueprint for the application is created. In the RAD Design Workshop, the author develops models and prototypes to visualize the system's functionality, ensuring it aligns with user needs.

Once the prototype is ready, the Implementation phase involves conducting final testing, specifically using the black-box testing method, to ensure the application functions as expected. After completing these stages, the Conclusion phase summarizes the findings and insights gathered throughout the research process. The object of this study is TPQ As-Sapphire, a place where children learn about Islam, and the goal is to create an interactive learning media that facilitates easier Quran learning for young students.

In terms of Data Collection, the research uses various approaches, such as observing the learning process at TPQ As-Sapphire over two weeks, conducting interviews with the teacher, and collecting data from relevant literature. This helps in developing a solid framework for the application. Additionally, Materials for the Research include Quranic data, QR codes to trigger AR objects, and the hardware and software required to develop the application.

For the Hardware Requirements, the application development requires specifications such as 8GB RAM, a Ryzen 5 3500U processor, and a Poco M4 Pro smartphone running Android 11. The application is designed to function on a variety of devices, with minimum specifications for smartphones including Android 6.0, 1GB RAM, and 4GB storage, and maximum specifications including Android 13, 8GB RAM, and 128GB storage. The Software Requirements include Windows 11 for the operating system, Unity 3D for app development, and Visual Studio Code for button creation. These tools and specifications ensure that the application will be compatible with a wide range of devices and provide a smooth user experience.

RESULTH AND DISCUSSION

The results of the creation of the Juz Amma Augmented Reality learning application are the stage where the output of the application can produce outputs that are in accordance with the desired purpose as follows:

a. Creation of character designs, markers and app displays
b. Collection of materials that the app needs such as Animated characters, audio, and image markers
c. Creation of assemblies that include merging into the Vuforia marker database, and application development in Unity.

The result of this research is that the Augmented Reality application is built according to existing needs. The following are the results of the application that has been created:

a. Main menu
   The main menu of the Juz Amma Augmented Reality application has a display containing Scan Ar which is marked with the Play, Information, Credit, and Exit buttons, here is the Main menu of this application:

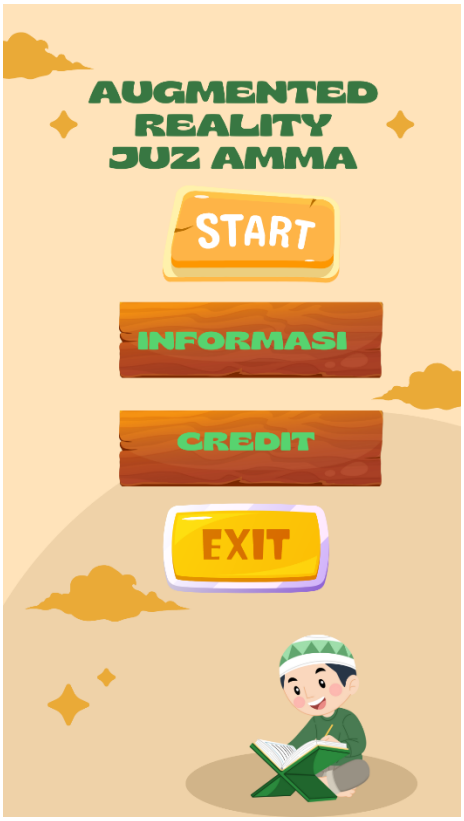


Figure 1. Main Menu Interface

b. Information

The Information menu of the Juz Amma Augmented Reality application has a display that contains Information about this application, the following is the View of Information from this application:

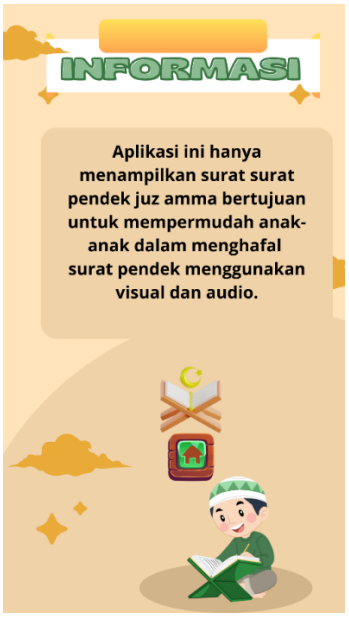
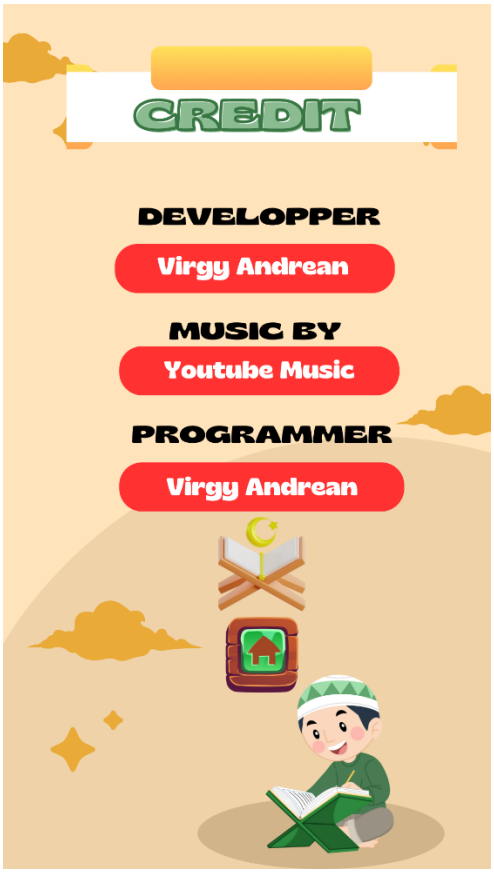


Figure 2. Information Interface

c. Credit

Main Credit Juz Amma Augmented Reality application has a display containing the developer profile and audio source used in this application, the following is a View of Credit from this application:



Gambar 3. Interface Credit

Scan AR

Scan AR works by using the rear cellphone camera to scan the markers that have been provided, here is the appearance of Scan AR from this application:

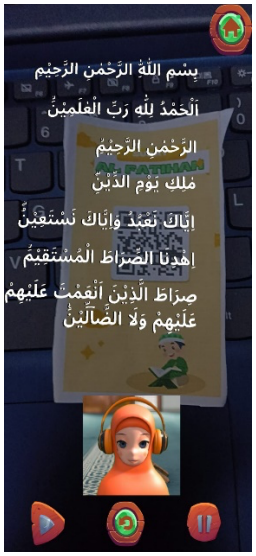


Figure 4. Display when the Marker has been scanned

Discussion

The design and creation of this application as a learning medium based on mobile android smartphones to provide a different experience when memorizing Juz Amma letters, especially short letters. This application uses markers as a scanning medium using smartphones. Regarding the explanation of the application as follows:

a. The main menu of the application has 4 buttons, namely the Play button, the Information Button, the Credit Button, and the Exit Button.
b. The Play button functions to activate the smartphone's rear camera that will be used to detect markers.
c. The Information button functions to display information about the functions of the application and there is a back/Return button to the main page.
d. The Credit button displays a brief developer profile and the audio source used on the app and the back button.
e. The Exit button functions to close the application

Table 1. Results

No	Question	Number of Respondents	Alternative Answers			
			SS	S	TS	STS
1.	Easy-to-use app	5	3	2	-	-
2.	The sound on the app is clearly heard	5	4	1	-	-
3.	Buttons work well	5	5	-	-	-
4.	Helps in memorizing short letters	5	4	1	-	-
5.	Interesting apps to use	5	4	1		-
Total		25	20	5	-	-
Total Percentage		100%	80%	20%	0%	0%

Source: Author

The results of the overall questionnaire collected from children who used this application indicate that the learning application is considered quite effective in supporting the memorization of short letters in an interesting and interactive way. Based on the responses, 80% of participants strongly agreed and 80% agreed that the application facilitated their learning, placing the results in the successful category. These findings are consistent with previous research, which demonstrates that Augmented Reality (AR) can enhance engagement and learning outcomes in educational settings. For instance, Putri et al. (2022) found that AR-based learning media increased children's motivation and retention of educational content due to its interactive and immersive features. Similarly, Rahmawati and Hidayat (2021) highlighted that interactive media positively impacts learning effectiveness in Quranic education, particularly in memorizing short surahs. The current study reinforces these findings by showing that combining three-dimensional AR visualization with interactive elements in a Juz Amma learning application can significantly improve children's interest, motivation, and memorization outcomes.

CONCLUSION

With this Augmented Reality technology, it can help motode in memorizing short letters to children to make it easier and more interesting to increase children's interest in learning. The development of technology, especially Augmented Reality (AR), has had a significant impact on people's lives, including children. AR, which combines virtual objects in a real environment, offers a more interactive and engaging learning method. In the midst of the challenges of teaching reading and writing the Quran to children with conventional methods that are often considered boring, the use of AR technology can be an innovative solution. With AR, learning the Quran, especially Juz Amma, can be delivered in a more contextual and engaging way, utilizing the advantages of technology to make the learning process more effective. The Quran as a guide to life and a rich source of knowledge, will benefit from the application of AR technology that can increase children's interest and understanding in learning the holy book.

BIBLIOGRAPHY

Ahmad, H., Zainuddin, N. M. M., Ali, R., Maarop, N., Yusoff, R. C. M., & Hassan, W. A. W. (2018). Augmented Reality To Memorize Al-Quran For Hearing Impaired Students: A Preliminary Analysis. *J Fundam Appl Sci*, *10*(2S).

Ahmad, H., Zainuddin, N. M. M., Yusoff, R. C. M., Azmi, N. F. M., & Hassan, W. A. W. (2019). Augmented reality model to aid Al-Quran memorization for hearing impaired students. Dalam *Lecture Notes in Networks and Systems* (Vol. 67). https://doi.org/10.1007/978-981-13-6031-2_12

Al-Ansi, A. M., Jaboob, M., Garad, A., & Al-Ansi, A. (2023). Analyzing augmented reality (AR) and virtual reality (VR) recent development in education. Dalam *Social Sciences and Humanities Open* (Vol. 8, Nomor 1). https://doi.org/10.1016/j.ssaho.2023.100532

Arena, F., Collotta, M., Pau, G., & Termine, F. (2022). An Overview of Augmented Reality. Dalam *Computers* (Vol. 11, Nomor 2). https://doi.org/10.3390/computers11020028

Elmqaddem, N. (2019). Augmented Reality and Virtual Reality in education. Myth or reality? *International Journal of Emerging Technologies in Learning*, *14*(3). https://doi.org/10.3991/ijet.v14i03.9289

Firdaus, M. B., Budiman, E., Pati, F. E., Tejawati, A., Anam, M. K., Informasi, T., Riau, S. A., Kelua, K. G., Alam, J. Z. P., Lampung, B., & Indah, J. P. (2022). Penerapan metode marker based tracking augmented reality pesut mahakam. *Jurnal TEKNOINFO*, *16*(1).

Grubert, J., Langlotz, T., Zollmann, S., & Regenbrecht, H. (2017). Towards pervasive augmented reality: Context-awareness in augmented reality. *IEEE Transactions on Visualization and Computer Graphics*, *23*(6). https://doi.org/10.1109/TVCG.2016.2543720

Gudoniene, D., & Rutkauskiene, D. (2019). Virtual and augmented reality in education. *Baltic Journal of Modern Computing*, *7*(2). https://doi.org/10.22364/bjmc.2019.7.2.07

Huang, T. K., Yang, C. H., Hsieh, Y. H., Wang, J. C., & Hung, C. C. (2018). Augmented reality (AR) and virtual reality (VR) applied in dentistry. Dalam *Kaohsiung Journal of Medical Sciences* (Vol. 34, Nomor 4). https://doi.org/10.1016/j.kjms.2018.01.009

Ibharim, N. A. N., Ramli, S. Z., Zahari, S. A., Edyanto, N. A. A., & Zawawi, M. A. A. (2021). Learning history using augmented reality. *International Journal of Multimedia and Recent Innovation*, *3*(1), 1-10. https://doi.org/10.36079/lamintang.ijmari-0301.199

Lidianti, D., Putra, P., Oktadini, N. R., Meiriza, A., & Sevtiyuni, P. E. (2022). Pemanfaatan Teknologi Augmented Reality Dalam Pembelajaran Huruf Hijaiyah dan Makhorijul Huruf. *TeIKa*, *12*(02). https://doi.org/10.36342/teika.v12i02.2941

Muñoz-Saavedra, L., Miró-Amarante, L., & Domínguez-Morales, M. (2020). Augmented and virtual reality evolution and future tendency. *Applied Sciences (Switzerland)*, *10*(1). https://doi.org/10.3390/app10010322

Pinto, A. S., Abreu, A., Costa, E., & Paiva, J. (2022). Augmented Reality for a New Reality: Using UTAUT-3 to Assess the Adoption of Mobile Augmented Reality in Tourism (MART). *Journal of Information Systems Engineering and Management*, *7*(2). https://doi.org/10.55267/iadt.07.12012

Ramli, R., Mohid, S. Z., & Abas, H. (2020). Augmented Reality Book to Aid Learning Tadabbur Al- Quran : A Visualization Tool. *6th International Conference on Information Technology & Society*.

Rauschnabel, P. A., Felix, R., Hinsch, C., Shahab, H., & Alt, F. (2022). What is XR? Towards a Framework for Augmented and Virtual Reality. *Computers in Human Behavior*, *133*. https://doi.org/10.1016/j.chb.2022.107289

Sari, L. (2022). Penerapan Augmented Reality Sebagai Media Pembelajaran Pengenalan Ilmu Tajwid Berbasis Android. *Journal of Engineering, Technology, and Applied Science*, *4*(2). https://doi.org/10.36079/lamintang.jetas-0402.386

Vovchak, O., Dziurakh, Y., Kulyniak, I., Halkiv, L., & Rachynska, H. (2022). Economic Mechanism Of State Regulation Of The Investment Activity In Agriculture. *Financial and Credit Activity: Problems of Theory and Practice*, *3*(44). https://doi.org/10.55643/fcaptp.3.44.2022.3774