TRENDS IN THE USE OF AUGMENTED REALITY AND VIRTUAL REALITY TECHNOLOGY IN LEARNING ISLAMIC RELIGIOUS EDUCATION IN INDONESIA

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Keywords:	ABSTRACTS
Augmented Reality, Virtual Reality, Islamic Religious Education	*This study aims to determine the trend of using Augmented Reality and Virtual Reality technology in learning Islamic Religious Education in Indonesia in 2018-2023 and to determine the results of its use in learning Islamic Religious Education. The research method uses a systematic literature review (SLR) of several journal articles with inclusion criteria determined through the publish and perish tool with the keywords Augmented Reality, Virtual Reality, and Education. From the study results, 20 articles that met the criteria were selected. The content analysis results show that the trend of using augmented reality and virtual reality in learning Islamic Religious Education in Indonesia is still relatively small, such as in the metaverse of Hajj Umrah, tajweed science, and daily Tajweed. Prayer, the introduction of hijaiyyah letters, religious tourism, and the introduction to ablution procedures. This can be a further research finding that needs to be developed in learning Islamic religious education in Indonesia.*

A. INTRODUCTION

The problem of using information technology in education is significant, especially with society's completely practical mindset, so it cannot be separated from technology (Jumarlis, 2018; Khan et al., 2022). Moreover, in entering the 21st century, many technologies are developing and complementing each other in creative and innovative developments in various aspects of life, including in the world of education (Bakri et al., 2019; Fauzi et al., 2018; Khan et al., 2022). In the development of educational technology, we must have speed in keeping up with a more rapidly changing era, such as the use of augmented reality and virtual reality technology in Islamic Religious Education learning.

AR and VR can also help overcome obstacles to learning Islamic Religious Education in Indonesia, such as limited adequate teaching materials or direct experience with the object of study. (Morales & Garcia, 2018; Murhayati et al., 2019; Punar Özçelik, 2022; Sáez-López et al., 2019). This technology can expand learning reach by providing students with richer visual and interactive access, which may be challenging to achieve through traditional methods. Its implementation supports learning and makes it more interactive and contemporary (Khan et al., 2022; Senoaji et al., 2020; Wen, 2021).

Many people use this technology in education because it has excellent features that improve the teaching and learning system (Morales & Garcia, 2018; Murhayati et al., 2019; Sáez-López et al., 2019). The use of augmented reality and virtual reality technology has been proven to increase students' interest in learning material because augmented reality and virtual reality have attractive aspects that can increase students' interest and motivation to learn (Chen et al., 2020; Khairuldin et al., 2019; Murhayati et al., 2019; Rafik et al., n.d.; Zejda & Canoy, 2015). Apart from that, students can also get an atmosphere of learning and playing because when studying material, they can project it realistically.

The trend of using AR and VR in Islamic Religious Education learning in elementary schools shows that this technology provides a more engaging, interactive, and relevant learning experience for students (Çetin, 2022; Lozada-Yánez et al., 2019; Morales & Garcia, 2018). With AR, students can see and interact with digital elements added on top of physical objects, as is the case in understanding material about the history of Islamic civilization (Nurhadi et al., 2017) introduction of hijaiyyah letters (Jumarlis, 2018), prayer education (Khairuldin et al., 2019), praying (Anggara & Fahlevi, 2021; Murhayati et al., 2019), as well as Hajj and Umrah (Senoaji et al., 2020).

This research and development aim to explore the various contributions of Augmented Reality (AR) and Virtual Reality (VR) technology to learning, the benefits generated, the challenges faced, and the implications for future curriculum and teaching development.

B. METHOD

The research design here uses the systematic literature review (SLR) method. (Mengist et al., 2020). The SLR method in this article explores the trend of using Augmented Reality (AR) and Virtual Reality (VR) in Islamic Religious Education Learning in Indonesia by referring to the preferred reporting items for systematic reviews and meta-analysis (PRISMA) flow. (Page et al., 2021) through the identification, screening, eligibility, and inclusion (Mengist et al., 2020; Putri Sayekti, 2022).

Article findings obtained from the Scopus and Google Scholar databases were then analyzed using VOSviewer to map the initial network of these links. Initial analysis of thematic associations in Figure 1 shows that the trend in using Augmented Reality (AR) and Virtual Reality (VR) in Islamic Religious Education Learning in Indonesia has a very complex pattern of associations.
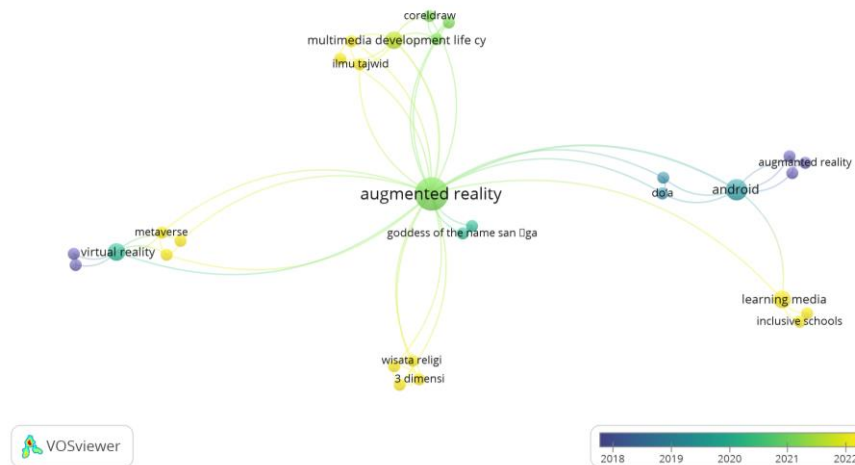

Figure 1 Overlay Visualisation VOSviewer

Next, the selected articles were obtained from screening and assessment of eligibility for the data analysis stage. The themes are read from the title to the conclusion. After that, it is analyzed, and the results are presented as a PRISMA flow diagram, as in Figure 2.
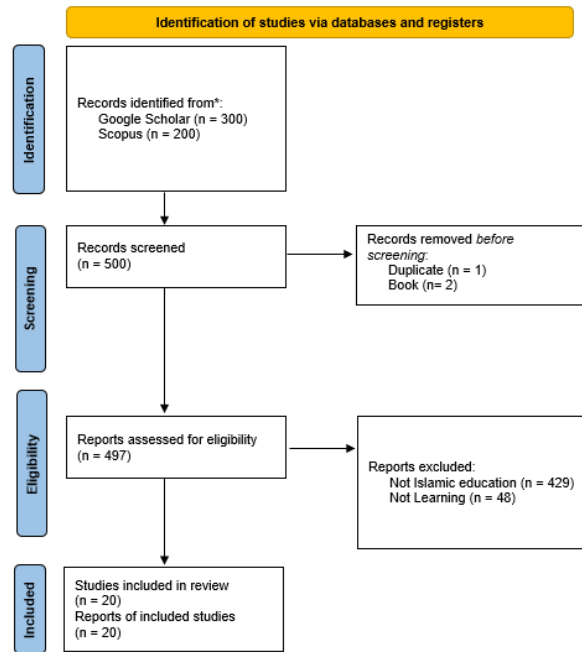
Figure 2 PRISMA flow chart resulting from the publication of trends in the use of augmented reality (AR) and virtual reality (VR) technology in PAI learning in Indonesia in 2018-2023

C. RESULT AND DISCUSSION

Before presenting qualitative results by the research questions, it is necessary to present the article findings first. Based on 20 articles that met the criteria, researchers classified articles based on publications per year. Starting in 2018, there were two articles; in 2019, there was 1 article; in 2020, there were three articles; in 2021, there were four articles; in 2022, there were seven articles; and in 2023, there were three articles, as shown in Figure 3. Meanwhile, the quality of the articles based on Sinta and Scopus obtained data, as shown in Figure 4.
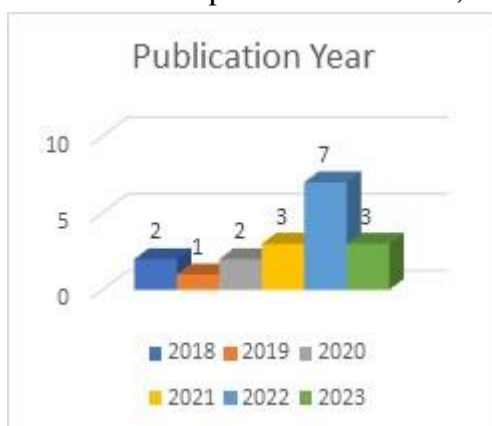
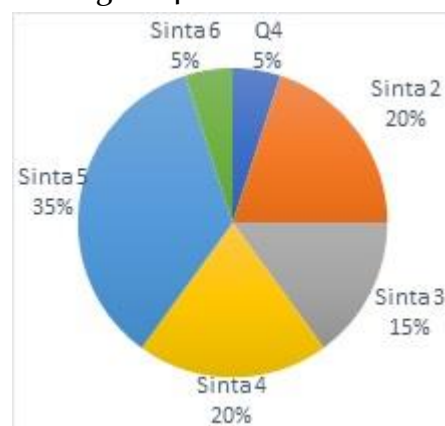

Figure 3 Publication Year Chart

Figure 4 Article Index Diagram

Trends in the use of Augmented Reality (AR) and Virtual Reality (VR) in Islamic Religious Education Learning in Indonesia

The trend of using Augmented Reality (AR) and Virtual Reality (VR) in Islamic Religious Education learning in Indonesia has increased significantly in the last few years. AR and VR provide an interactive and engaging learning approach for students and enrich their learning experience (Maisaroh et al., 2021; Mundir & Umiarso, 2022; Sari, 2022; Wahyuni, 2022). Based on a systematic literature review of several articles, researchers found the use of augmented and virtual reality in learning Islamic Religious Education in Indonesia, as in Table 2.

Table 2 Trends in the Utilization of Augmented Reality and Virtual Reality in Islamic Education Learning in Indonesia from 2018-2023

Temuan	Sumber
Metaverse Haji Umroh	(Indrabayu et al., 2022)
Ilmu Tajwid	(Sari, 2022)
Doa	(Arthana & Ismail, 2019; Cut Citra Novita et al., 2022; Maisaroh et al., 2021; Mundir & Umiarso, 2022)
Huruf Hijaiyyah	(Jumarlis, 2018; Salsabila et al., 2023)
Wisata Religi	(Ali et al., 2022; Kusumaningsih et al., 2018)
Wudlu	(Yakub & Fadli, 2021)

Based on the literature review from 2018-2023, the trend of utilizing Augmented reality and virtual reality in learning Islamic Religious Education in Indonesia is still relatively small, such as in the metaverse of Hajj Umrah, tajweed science, recitation of daily prayers, the introduction of hijaiyyah letters, religious tourism and introduction to wudhu procedures.

Learning Islamic Religious Education, AR, and VR can help students understand religious concepts more profoundly and present material that is difficult to imagine in real life. For example, through AR, students can observe and interact with digital simulations of holy places in the metaverse world, such as the Grand Mosque or the Prophet's Mosque (Indrabayu et al., 2022). They can learn about the history, architecture, and religious practices associated with these places. This will provide an immersive experience and enrich students' understanding of Islam.

Meanwhile, VR can also be used to create an immersive learning environment. (Murjani et al., 2021). In Islamic Religious Learning, students can experience the sensation of being inside a mosque or other holy places through virtual experiences. They can see and hear essential details and observe religious ceremonies in greater depth. Using this technology, students can experience religious atmospheres and nuances that are inaccessible through conventional learning.

In addition, AR and VR can also be used to help students learn the Quran, hadith, and hijaiyyah letters. (Jumarlis, 2018; Sari, 2022). Through AR applications,

Quranic and hadith texts can be displayed three-dimensionally, allowing students to understand their structure and context better. They can gain a deeper understanding of the meanings and messages contained in these sacred texts.

By utilizing AR and VR trends in Islamic Education learning, students are likely to develop greater interest and appreciation for their religion. This technology can create a fun, interactive, and enriching learning experience, thus motivating students to learn with more enthusiasm. This aligns with what Rusydiyah stated: that innovative and creative learning will foster students' interest in literacy. (Rusydiyah, 2020). In addition, the use of AR and VR can also help overcome time and space limitations in religious learning, allowing students to access religious materials more flexibly.

Several challenges need to be overcome to realize the full benefits of these technologies in education. One of the main challenges is the lack of access to technology and infrastructure, especially in rural areas and underprivileged communities. (Inayah et al., 2022; Salsabila, 2023). Thus, educational institutions in rural or peripheral areas have difficulty utilizing AR and VR due to the limited costs they have to pay for tools and limited internet network access. At the same time, these two things are the principal parts of using AR and VR.

These challenges make the use of AR and VR in learning Islamic Religious Education in Indonesia less optimal; this can be seen from the lack of article literature that examines the use of AR and VR in learning Islamic Religious Education. This condition makes the limited range of AR and VR-based PAI learning materials delivered to students.

Another challenge is teacher competence in mastering the novelty of technology in the digital era, such as AR and VR, in learning. So, teachers must be trained to use this technology to implement AR and VR-based learning materials (Inayah et al., 2022).

The results of the use of *Augmented Reality* (AR) and *Virtual Reality* (VR) in Islamic Education Learning in Indonesia

Incorporating Augmented Reality (AR) and Virtual Reality (VR) technology in education has opened up new opportunities to create comprehensive and immersive learning experiences, especially in Islamic Religious Education. Integrating these two technologies allows for innovative and engaging learning strategies, combining the advantages of AR and VR to achieve more effective results. In religious learning, AR can provide additional information and relevant context in VR, enhancing students' understanding of complex religious concepts.

One example of the application of AR and VR integration in religious education is by improving VR simulations in the metaverse world and the history of Islamic civilization. In the VR experience, students can enter a virtual environment featuring sacred places or critical moments in religious history. Additional

information can be provided to students in real time as they interact with objects or locations in a VR environment. For example, when students are in a simulated Grand Mosque or materials on Hajj and Umrah, VR and AR can display relevant Quranic texts or hadiths related to the place, providing context and a better understanding of the spiritual significance of the place.

In addition, the use of AR and VR integration in religious education also enables interactive and immersive learning through interactive stories. In VR experiences, students can "plunge" into religious narratives and serve as essential figures in the history of religion. With AR, stories can be enriched with additional information that appears around students in a VR environment. It encourages students to actively participate in the story and reflect on and understand the implications of the events they experience in the VR simulation.

Integrating AR and VR can also facilitate students' introduction to archaeological artifacts or historical objects relevant to religion. With AR, students can "bring to life" physical objects, for example, ancient manuscripts or historical relics, and gain more information about their origin, meaning, and historical context. Then, through VR, students can feel the sensation of being in the historical environment where the artifacts were first used or connected to essential events in religion.

In the context of religious education that prioritizes interaction and collaboration, the integration of AR and VR can facilitate shared learning. AR can allow students to communicate and interact in the same virtual environment, creating opportunities for discussion, debate, or sharing understanding on specific religious topics. In this case, VR provides sustainability of an immersive environment, so students feel genuinely engaged in collaborative learning that transcends space and time constraints.

Combining AR and VR in Islamic religious education learning in Indonesia by utilizing this technology can create a comprehensive, interactive, and immersive learning experience. Students can explore complex religious concepts, understand historical contexts and sacred texts, and actively participate in collaborative learning. However, challenges to be addressed include improved accessibility of technology, teacher training, and further research to measure the effectiveness and impact of AR and VR in religious education.

D. CONCLUSION

Based on a literature review from 2018-2023, the trend of utilizing Augmented reality and virtual reality in learning Islamic Religious Education in Indonesia is still relatively small, such as in the metaverse of Hajj Umrah, tajweed science, daily prayer readings, introduction to hijaiyyah letters, religious tourism and the introduction of ablution procedures. This can be a finding of further research that needs to be developed in learning Islamic religious education in Indonesia. Augmented Reality

(AR) and Virtual Reality (VR) in learning Islamic Religious Education in Indonesia have provided significant results. AR and VR technology provide an interactive, fun learning approach, enrich the student learning experience, and create an immersive learning environment in learning Islamic Education in Indonesia.

E. SUGGESTIONS AND ACKNOWLEDGMENTS

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