

**INTEGRATION OF AUGMENTED REALITY IN FIQH LEARNING:
Improving The Competence of Technological Pedagogical Content Knowledge (TPACK)
Of Madrasah Teachers**

Fathurohim

Institut Agama Islam KH Sufyan Tsauri Majenang
fathur1876@gmail.com

Pipit Mulyah

Institut Agama Islam KH Sufyan Tsauri Majenang
pipitmulyahoke@gmail.com

Nasrulloh

Institut Agama Islam KH Sufyan Tsauri Majenang
nasrulloh@gmail.com

Abstract: *This study explores the use of Participatory Action Research (PAR) to integrate Augmented Reality (AR) in teaching Fiqh, specifically the Hajj material, at Madrasah Ibtidaiyah in Sidareja District. Involving 20 teachers, the research followed the PAR cycle, consisting of planning, action, observation, and reflection. The implementation of AR, supported by the Technological Pedagogical Content Knowledge (TPACK) framework, helped teachers effectively incorporate technology in the classroom, enhancing their teaching practices. It also made learning more engaging and accessible for students, improving their understanding of the Hajj material. The results show that AR can significantly improve students' comprehension of Fiqh and support interactive, technology-enhanced learning in religious education.*

Keywords: *Participatory Action Research, Augmented Reality, TPACK, Fiqh.*

INTRODUCTION

Religious education, especially the teaching of Fiqh, plays an important role in shaping students' spiritual and moral understanding. ¹. At the Madrasah Ibtidaiyah level, learning Fiqh is one of the crucial aspects that not only includes understanding the concepts of Islamic law but also the practice of worship, one of which is the material of Hajj. Hajj material is often a challenge for teachers and students, because in addition to requiring a deep understanding of the theory, students must also understand the complex steps and implementation of Hajj. ².

¹ Aslan, *Learning Fiqh in Madrasah Ibtidaiyah*, 1st edn (Feniks Muda Sejahtera, 2022), 1; Juni Swan Pangesti, *The Role of Fiqh Teachers in Increasing Student Motivation in Fiqh Subjects at SMP Islam Amanah Ummah Mojolaban Sukoharjo*, *Educational Journal*, 2023, XII <<https://jurnaldidaktika.org505>>.

² Via Yustitia and Nia Kania, *EDUCATION IN THE DIGITAL ERA*, 2024 <<https://www.researchgate.net/publication/378494193>>.

Given the importance of this understanding, the use of innovative and developmentally appropriate methods is key to improving the effectiveness of learning.

Along with the development of technology, the world of education is now increasingly open to the application of digital technology in the teaching and learning process. One of the promising technologies to improve the quality of learning is Augmented Reality (AR). *Click or tap here to enter text.* AR allows students to interact with virtual objects displayed in the real world through technological devices such as smartphones or tablets. With AR, students can experience a more thorough and interactive learning experience, which allows them to understand abstract concepts in a more concrete and digestible way. For example, in learning Fiqh Hajj, AR can be used to visualize the steps of Hajj in real time, giving students a clearer picture of the practice.

However, using technology in learning is not just about applying it technically. It requires a good understanding of how to integrate technology with the existing learning process. One framework that can be used to understand and integrate technology in education is *Technological Pedagogical Content Knowledge (TPACK)*.³ TPACK combines technological, pedagogical and content knowledge in learning that enables teachers to design learning that is not only technically effective, but also pedagogically relevant and appropriate to the material being taught. In the context of learning Hajj Fiqh, the use of AR combined with the TPACK framework is expected to create learning that is more effective, interactive, and relevant to student needs.⁴

Basically, AR in education serves to enrich the learning experience, allowing students to see and interact with content that they cannot access directly. In this case, Hajj material that is abstract and difficult to understand through verbal explanations can be explained in a more visual and in-depth way using AR. For example, using AR, students can see three-dimensional animations of the stages of Hajj, as well as get further explanation of each stage directly. This certainly provides added value in improving their understanding.

However, although the potential of AR in education has been widely discussed, its application in learning Fiqh in Indonesia, especially in Madrasah Ibtidaiyah, is still limited.

³ Imroatul Ajizah and Muhammad Nurul Huda, 'TPACK AS A DEVICE FOR PAI TEACHERS IN THE ERA OF INDUSTRIAL REVOLUTION 4.0', *Ta'allum: Journal of Islamic Education*, 8.2 (2020), pp. 333-52, doi:10.21274/taalum.2020.8.2.333-352.

⁴ Wildan Nur Hidayat, Eko Purnomo, and Noor Aziz, 'Technological Pedagogical and Content Knowledge (TPACK) in Islamic Religious Education in the Digital Era', *JOURNAL OF EDUCATION*, 4.1 (2023), pp. 93-106 <<http://yphn.ac.id/ejournal/index.php/Alhikmah/index>>.

Research on the integration of AR in learning Islamic religion, especially Fiqh, at the elementary level has not been found. The majority of previous studies focus more on the use of AR in science or mathematics subjects, which are considered easier to visualize with technology. On the other hand, religious education still often relies on conventional methods, although technological developments have brought significant changes in the education sector in general.⁵ Therefore, this study aims to bridge this gap by examining the application of AR in learning Fiqh at Madrasah Ibtidaiyah using the TPACK approach.

The utilization of AR to teach Hajj material in Fiqh at the elementary level is a topic that is still rarely applied. In addition, this research integrates AR with the TPACK approach, which offers a new perspective in teaching Fiqh at Madrasah Ibtidaiyah. By combining advanced technology and strong pedagogical knowledge, this research hopes to contribute to the development of more innovative and effective religious learning methods.

However, research that examines the application of AR technology in learning Fiqh, especially in Madrasah Ibtidaiyah is still lacking. In addition, although the use of technology in religious education is growing, its application in the context of religious education in Indonesia, especially with the TPACK approach, is still very limited. Most of the previous studies have focused more on technology in science and mathematics, making religious education an area that has received less attention in this context. Therefore, this research is expected to fill the void and provide new insights into how AR technology can be applied in religious learning, especially in Hajj material.

Improving the Technological Pedagogical Content Knowledge (TPACK) competencies of Madrasah teachers has a high urgency in facing the challenges of 21st century education. TPACK is a knowledge framework that integrates three important components: knowledge of teaching materials (content), pedagogical knowledge (how to teach), and technological knowledge (tools and media used in teaching). In the digital era, teachers' mastery of TPACK is essential to create relevant and effective learning.⁶ First, TPACK competencies enable teachers to appropriately integrate technology in the learning process, such as the use of

⁵ Indra Maulana and Hafis Ramadhan Setiawan, 'Training in Making Augmented Reality-Based Learning Media with the Assemblr Edu Platform', *JAMU: Journal of Abdi Masyarakat UMUS*, 5.01 (2024), pp. 12-19.

⁶ Ajizah and Huda, 'TPACK AS A DEVICE FOR PAI TEACHERS IN THE ERA OF INDUSTRIAL REVOLUTION 4.0'; Musdalifa Musdalifa and Ariantje Dimpudus, 'Integration of TPACK (Technological, Pedagogical, and Content Knowledge) in Learning Mathematics on Algebraic Forms', *Arjuna Journal: Publication of Education, Language and Mathematics*, 2.3 (2024), pp. 266-75, doi:10.61132/arjuna.v2i3.877; Asri Rahmawati, Sandi Budiana, and Hida Wahida Chusen, 'IMPROVING STUDENT'S LEARNING RESULTS THROUGH THE TPACK APPROACH ASSISTED WITH AUGMENTED REALITY MEDIA CLASS V SD'.

Augmented Reality (AR) in Fiqh materials. AR provides three-dimensional visualizations that help students understand abstract concepts, such as the stages of Hajj, in a more interesting and understandable way. Secondly, improved TPACK competencies also support more inclusive learning by utilizing various technological tools to cater to students' different learning styles. In addition, improved TPACK enables teachers to manage digital classrooms more effectively, and supports students' independent and collaborative learning. This mastery of technology also prepares students for a world of work that increasingly relies on digital skills. Lastly, TPACK development contributes to teachers' professionalism, making them better prepared for the increasingly complex and global demands of education. Improving Madrasa teachers' TPACK competencies is crucial to creating quality learning, relevant to technological developments, and able to prepare students to face future challenges.

Thus, this research not only adds to the understanding of how technology can be utilized in religious education but also offers practical solutions to improve the quality of learning in Madrasah Ibtidaiyah. It is hoped that the findings from this study can be implemented by Fiqh teachers in optimizing the learning process using technology, while improving the quality of religious education in Indonesia as a whole.

THEORETICAL STUDIES

Islamic Philosophy's View on the Application of Technology in Learning

Islamic philosophy views science and technology as a means to get closer to Allah and the benefit of the people. In Islam, knowledge is a trust that must be managed for the good of mankind, and technology should be used to support the development of useful knowledge. The application of technology in learning needs to be seen through an Islamic perspective, which emphasizes not only worldly progress, but also the formation of noble character and morals.⁷

In the Qur'an, Allah says, "And say: 'O my Lord, increase me in knowledge.'" (Q.S. Taha: 114), which emphasizes the importance of knowledge seeking. Technology in education, if used correctly, can enrich the learning experience, provide wider access to educational resources, and facilitate more interactive learning. For example, technologies such as Augmented Reality (AR) can help students understand concepts in Fiqh learning, such as the performance of Hajj, that are difficult to explain with just text or pictures.

⁷ Hisarma Saragih and others, *Philosophy of Education*, ed. by Abdul Karim, 1st edn (Yayasan Kita Menulis, 2021), 1.

However, technology must be used wisely, taking into account Islamic values that prioritize honesty, justice, and benefits for the people.⁸ Technology is not an end, but a means to enrich knowledge and bring people closer to Allah. Islam also emphasizes the importance of creativity and innovation, as taught in the Prophet Muhammad's hadith: "Verily, Allah loves that when one of you does a work, he does it to the best of his ability." (HR Muslim). Technology can encourage creativity in learning, facilitate the creation of more interesting and effective materials, and create new ways to deliver materials.

It is also important to consider the ethical impact of using technology. Technology should be used for purposes that are in accordance with Islamic teachings, avoiding misuse that could damage students' morals. In addition, technology can be an effective means of da'wah, extending the reach of religious knowledge to Muslims in various places, which was previously limited by time and space. Thus, technology in education can support the spread of goodness, without ignoring Islamic values.

Augmented Reality in Education

Augmented reality (AR) is a technology that combines elements of the real world with virtual objects, allowing users to interact with the environment in real-time through digital devices such as smartphones or tablets. AR can be used to display additional information in the form of visuals, audio, or text added to the real world, thus creating a more immersive and interactive learning experience.⁹ In an educational context, AR offers many benefits, including increasing student engagement, clarifying abstract concepts, and enabling deeper exploration of subject matter that is difficult to understand with traditional methods.

In learning Fiqh, especially Hajj material, AR can be used to visualize the stages of Hajj in detail, provide a direct description of the locations involved in the implementation of worship, and present simulations of the steps that must be taken by pilgrims. Thus, students not only understand the theory but can also feel and observe the implementation of worship more

⁸ Ilma Nurhasibah, Al Mudarisah, and Abdul Syukur, *Introduction of Augmented Reality Technology as an Effort to Protect Children's Rights from Technological Development in Jatisari Village, Cisompet District*, 2021 <<https://proceedings.uinsgd.ac.id/index.php/Proceedings>>.

⁹ Damba Permatasakti and Vera Jenny Basiroen, 'Experimental Design: Javanese Folktale Preservation Using Augmented Reality Technology', *Humaniora*, 9.3 (2018), p. 265, doi:10.21512/humaniora.v9i3.4501; Hilda Ashari and others, 'Augmented Reality (AR) Training to Improve Teacher Competence in the Digital Era', *TEKNOVOKASI: Journal of Community Service*, 2.1 (2024) <<http://journal.unm.ac.id/index.php/TEKNOVOKASI>>.

realistically. This will help students understand the complex process of Hajj and strengthen their memory of the material learned.

Technological Pedagogical Content Knowledge (TPACK)

Technological Pedagogical Content Knowledge (TPACK) is a framework that combines three main elements in learning: *knowledge of content*, *pedagogical knowledge*, and *technological knowledge*. TPACK emphasizes the importance of a holistic understanding of using technology effectively in learning, taking into account the relationship between the three aspects.¹⁰

Content Knowledge: This is an understanding of the material or topic being taught. In this context, content knowledge relates to the teacher's understanding of Fiqh material, specifically about Hajj, which includes the laws, procedures, and symbolism behind each stage of Hajj.

Pedagogical Knowledge: This refers to an understanding of how to teach effectively. The use of methods, strategies and approaches that are appropriate to the characteristics of students is the main focus of pedagogical knowledge. In the context of learning Fiqh, teachers need to choose methods that make it easier for students to understand material that is sometimes abstract and theoretical.

Technological Knowledge: Knowledge of how to utilize technology in learning, including the selection of appropriate devices, applications, and media. In this case, the use of AR as a technology in Fiqh learning is an application of technological knowledge that must be understood by teachers.

TPACK includes a balanced understanding and integration of these three elements. Teachers who have TPACK will be able to select technologies that are appropriate to the material being taught and combine those technologies with appropriate pedagogical approaches to achieve effective learning objectives. In this context, AR is not just a technological tool, but

¹⁰ Elya Umi Hanik and others, 'Elya Umi Hanik et al Integration of TPACK (Technological, Pedagogical, Content Knowledge) Approach of SIKL Elementary School Teachers in Implementing Digital Era Learning', *JEID: Journal of Educational Integration and Development*, 2.1 (2022), p. 2022; J Belda-Medina, 'Integrating Augmented Reality in Language Learning: Pre-Service Teachers' Digital Competence and Attitudes through the TPACK Framework', *Education and Information Technologies*, 27.9 (2022), pp. 12123-46, doi:10.1007/s10639-022-11123-3; Rindu Rahmatiah and others, 'TPACK (Technological Pedagogical Content Knowledge) Framework in the Perspective of Philosophy of Science to Welcome Future Education', *Scientific Journal of Education Profession*, 7.4 (2022), doi:10.29303/jipp.v7i4.1069.

should also be used in a way that supports effective pedagogy and enriches students' understanding of Fiqh materials.

Using AR to Improve Teachers' TPACK Competency

The improvement of teachers' TPACK competence can be seen from how they incorporate technology in their learning. AR allows teachers to enrich teaching methods with more immersive visualizations, thus making learning more interesting and easy to understand. Teachers who are skillful in integrating AR technology can connect the¹¹ content knowledge (Fiqh) with more interactive and effective pedagogical methods.

According to Koehler and Mishra (2009), teachers who have good TPACK competencies are able to adapt the use of technology to learning objectives, student characteristics, and the teaching context. In this case, AR is an effective tool to support students' understanding in learning Fiqh, especially in materials that require clear and concrete visualization. By utilizing AR, teachers not only passively teach content, but also invite students to actively interact with the material, which supports deeper learning.

Integrating AR with TPACK in Fiqh Learning

The integration of AR in Fiqh learning can be viewed as a practical implementation of TPACK, where technology (AR) is used to enrich content learning (Fiqh), with pedagogical approaches that support student engagement and understanding. In the context of Fiqh learning, AR can help visualize abstract concepts, such as the sequence of stages of Hajj, the locations involved in the process, and provide a deeper understanding of the symbolism and meaning behind each step of Hajj.

In learning using AR, teachers ensure that technology is not only used as a visualization tool, but also as a tool that supports the greater learning goal, which is a deep understanding of the Fiqh material. AR can be used to clarify the stages of Hajj in a more real way, for example by describing the atmosphere in Arafat or displaying an explanation of the pillars of Hajj that must be performed by each pilgrim. In this way, students can more easily understand the sequence of Hajj and understand the meaning contained in it.

In addition, in the implementation of AR, teachers use appropriate pedagogical approaches to support the use of this technology. For example, using inquiry-based learning or

¹¹ Basith Rahmatullah and Irma Kadarwati, 'Improving Teachers' TPACK Competencies Through Augmented Reality-Based Learning Media Development Training', *JPMN Jurnal Pengabdian Masyarakat Nusantara*, 3.2 (2023), pp. 125-36, doi:10.35870/jpmn.v3i2.1856.

problem-based learning strategies that allow students to actively interact with the material and construct their own knowledge. Thus, AR technology not only functions as a tool, but also becomes an integral part of the learning process that supports pedagogical goals.

RESEARCH METHODS

This study uses a Participatory Action Research (PAR) approach, which involves active collaboration between researchers and teachers in a cycle of planning, action, observation, and reflection to improve the quality of Fiqh learning using Augmented Reality (AR) technology through the Technological Pedagogical Content Knowledge (TPACK) approach. The PAR method was chosen because this approach allows direct participation from teachers who are the subject of the research, who can contribute directly to the learning improvement process carried out.¹²

The population in this study consisted of 20 Madrasah Ibtidaiyah teachers in Sidareja Subdistrict who teach Fiqh subjects, especially Hajj material. The selection of participants was based on the criteria of teachers who have experience teaching Fiqh and interest in the use of technology in learning. The research sample is all teachers involved in learning Fiqh in these schools, with the main focus on teaching Hajj material using AR technology. All teachers involved in this study will participate in the planning, implementation, and evaluation stages of using AR in learning.

Data collection instruments in this study include classroom observations, interviews, and documentation. Observations were conducted to assess how teachers integrate AR in the learning process and how students respond to the use of the technology. In-depth interviews were conducted with teachers to explore their understanding of the use of AR and TPACK in learning Fiqh, as well as how they overcome challenges in integrating technology in teaching. In addition, documentation in the form of field notes and video recordings were used to document the learning process and students' interaction with AR. Data collected through observations and interviews will be analyzed qualitatively, by identifying key themes related to the application of AR, challenges faced, and the impact of technology on students' understanding of Hajj material.

¹² Aspasia Stacey Rabba, Cheryl Dissanayake, and Josephine Barbaro, 'Development of a Web-Based Resource for Parents of Young Children Newly Diagnosed with Autism: Participatory Research Design', *JMIR Pediatrics and Parenting*, 3.2 (2020), doi:10.2196/15786; Nataliia Franchuk and others, 'Developing Future Primary School Teachers' Communication through Pedagogy of Partnership', *Journal of Education and Learning (EduLearn)*, 18.3 (2024), pp. 607-15, doi:10.11591/edulearn.v18i3.21668.

The data collection process was conducted in two cycles, each consisting of four stages: planning, action, observation and reflection. In the planning stage, teachers were invited to design lessons using AR with the help of researchers, utilizing TPACK as a framework. In the action stage, teachers implemented learning by utilizing AR in teaching Hajj material. During the observation stage, researchers observed the learning process and interacted with teachers and students to assess the use of AR. In the reflection stage, teachers and researchers together reflect on the learning process and the results achieved, and discuss improvements that can be made for the next cycle.

The researcher plays an active role in every stage of the research cycle, both in providing training to teachers on the use of AR, accompanying them during the teaching process, and in conducting data analysis. The researcher's presence aims to ensure that the use of AR is carried out appropriately and in accordance with TPACK principles, as well as to provide guidance to teachers in overcoming obstacles that may arise.

The research was conducted in several Madrasah Ibtidaiyah in Sidareja Sub-district, with a planned research duration of six months, which includes two PAR cycles. Each cycle will last for three months, starting with lesson planning, AR implementation, observation of the learning process, and reflection with teachers. In terms of data validity, this research uses several techniques to ensure data validity and reliability. Data validity was obtained through source triangulation, namely by comparing data from various sources, such as interviews with teachers, classroom observations, and field notes. In addition, validity checking was carried out by involving participants in the reflection process and group discussions to ensure that the results of the analysis were in accordance with their experiences and perceptions. To ensure data reliability, the researcher double-checked the findings and data interpretation by involving peers in data analysis. In this study, the specifications of the tools used are AR devices that can be run on smartphones or tablets, such as AR-based learning tools applications specifically designed for education. This application is equipped with visualization material of the steps of the Hajj that can be projected in the real environment through the device screen. The material used is the Fiqh learning module that has been adapted to the Madrasah Ibtidaiyah curriculum, with material focused on the Hajj.

With this approach, the research aims to explore and evaluate the application of AR technology in learning Fiqh from the TPACK perspective, as well as provide guidance for the development of technology-based learning in Madrasah Ibtidaiyah. The results of this study are expected to provide useful insights for the development of teaching methods that are more

effective, interactive, and relevant to technological developments in the world of Islamic religious education.

DISCUSSION

This study aims to explore the application of Augmented Reality (AR) in learning Fiqh in Madrasah Ibtidaiyah, with a focus on Hajj material, through the Technological Pedagogical Content Knowledge (TPACK) approach. Overall, this study shows that the use of AR can improve students' understanding of Fiqh material, especially Hajj, in a more interactive and contextualized way. In this discussion, the findings of this study will be analyzed to answer the research objectives, interpret the findings, and connect the findings with existing theories.

Integrating AR in Fiqh Learning with TPACK Approach

One of the main objectives of this research is to find out how the integration of AR in Fiqh learning can improve students' understanding of Hajj material, by utilizing the TPACK approach. The research shows that the integration of AR into Fiqh learning, especially the Hajj material, can provide a more interesting and in-depth learning experience for students. AR facilitates the visualization of the complicated stages of Hajj, which is difficult to understand only with verbal explanations. Students can see and interact directly with 3D images or videos of the locations involved in Hajj, as well as the steps they must perform, such as Tawaf, Sa'i, and Arafat. This provides a more concrete and immersive understanding compared to traditional learning methods.

The results of this study also show that the use of AR increases student engagement in the learning process. Previously, Hajj material was considered difficult and less interesting for most students. However, by using AR, students become more active in participating in learning, discussing with their friends, and asking questions to the teacher. Interaction with AR objects that display various visual elements of Hajj makes students feel more connected to the material taught.

The TPACK approach has been shown to be effective in integrating AR technology into Fiqh teaching.¹³ Teachers who have adequate technological knowledge can utilize AR in an

¹³ Wahyu Noviansyah and others, 'Efforts to INCREASE TEACHER COMPETENCY IN DESIGNING BIM-BASED AUGMENTED REALITY MEDIA', *BERNAS: Journal of Community Service*, 3.4 (2022), pp. 640-47, doi:10.31949/jb.v3i4.3096; Ashari and others, 'Augmented Reality (AR) Training to Improve Teacher Competencies in the Digital Era'; Permatasakti and Basiroen, 'Experimental Design: Javanese Folktales Preservation Using Augmented Reality Technology'.

appropriate way, not only as a visual aid but as part of a more holistic learning process. The use of AR accompanied by an appropriate pedagogical approach, such as problem-based or inquiry-based learning, allows students to understand the material better. In this case, AR is not just a technological tool, but also a means to enrich students' learning experience, provide a more real context and motivate students to go deeper into the Hajj material.

Interpretation of Findings

One of the important findings of this study is that students who took part in Fiqh learning with AR integration showed a better understanding of Hajj material, both in theoretical and practical aspects. For example, students who previously had difficulty understanding the stages of Hajj, such as the order of Tawaf or the pillars that must be carried out, can now follow the worship process more easily through AR visualization. Thus, it can be interpreted that AR serves as an effective visual aid to clarify concepts that are abstract and difficult to understand, which is a major obstacle in teaching Fiqh.

This study also found that AR helps students to build knowledge more contextually. Through AR, students not only gained knowledge about the theory of Hajj, but also gained a deeper understanding of the context of the place and time when the worship was performed. This is very important, considering that one of the challenges in teaching Fiqh material is the difficulty in connecting religious concepts with the reality of students' daily lives. The use of AR allows students to "experience" Hajj visually, even though they are not at the location.

This finding supports constructivism theory which emphasizes the importance of direct experience in the learning process. According to constructivism theory, students more easily understand and remember the material they learn if they can be directly involved in the process. AR provides opportunities for students to conduct independent exploration of Hajj materials, developing their understanding through visual experience and interaction with relevant objects.

Teacher Perception

Based on interviews conducted with teachers involved in this study, most teachers stated that the use of Augmented Reality (AR) technology in learning Fiqh, especially Hajj material, had a positive impact on their teaching. These teachers felt that AR helped them deliver material that had been quite difficult for students to understand, especially regarding the stages of Hajj which are complex and abstract.

Teacher 1, revealed that "AR helps me describe the process of Hajj in a more real way, so that students can more easily imagine and understand each stage, from Tawaf to Wukuf. So far, I have difficulty explaining the sequence only with words or static images." In addition, teachers also feel that the use of AR makes learning more interesting and can attract the attention of students, who are often less interested in Fiqh material if it is delivered using traditional methods.

However, some teachers also expressed challenges in using AR, mainly related to limited access to devices that support the technology, such as smartphones or tablets, as well as the need for additional training in operating AR applications. Teacher 2 said, "Although AR technology is very helpful, I need more time to understand how to use it optimally. Not all students also have AR-enabled devices, so sometimes we have to find solutions so that all students can participate."

Overall, teachers' perceptions show that although there are some challenges in implementing AR technology, the benefits gained in improving students' understanding of Fiqh materials and making learning more interesting and interactive are highly appreciated by teachers.

Student Perception

Questionnaires given to students after they follow the learning using AR show very positive results towards the use of this technology. The majority of students feel that learning with AR makes it easier for them to understand Hajj material, which has been considered difficult and complicated.

Student 1 assessed, "With AR, I can see how the ways of Hajj are done, not just read or hear about it. It helps me remember the steps." In addition, most students also stated that learning using AR is more fun and less boring. Student 2 added, "Learning with AR is more exciting because we can see and interact with three-dimensional images. It helps me focus more and not get bored quickly."

However, there were some students who found it a little difficult at first in understanding how to use the AR app, although they were eventually able to adjust after several conversations with the teacher. Student 3 stated, "It was a bit confusing at first, but after knowing how to use it, it became easier for me to understand the material." This shows the importance of intensive guidance from teachers in facilitating students to use this new technology.

In general, students' perceptions of the use of AR are very positive. They feel more interested and find it easier to understand the Hajj material because of the visualization presented by AR, which provides a clearer picture of how the Hajj is performed.

Integration with Existing Knowledge

The findings of this study can be integrated with existing knowledge on the use of technology in education. A number of previous studies have shown that technology, especially AR, can improve students' understanding in various fields, be it science, math, or language. For example, research by Sumarni and Widayati (2020) showed that AR can increase student engagement in science learning by providing a more interactive and visual learning experience. These findings are in line with the results of this study, which show that AR also has a positive impact in Fiqh learning, although this area has not been widely explored in previous research.

In addition, this study also supports the application of TPACK in education. TPACK underscores the importance of integration between technology, pedagogy, and content to create effective learning. In this case, the TPACK approach allows teachers to utilize AR in a way that supports the teaching of Hajj material, which is theoretical and requires visualization to facilitate understanding. Teachers who master TPACK can select technologies that suit the learning objectives, as well as combine those technologies with pedagogical strategies that support student engagement and understanding.

CONCLUSIONS

This study aims to explore and analyze the integration of Augmented Reality (AR) in Fiqh learning with a focus on improving Madrasah teachers' Technological Pedagogical Content Knowledge (TPACK) competencies. Based on the findings obtained, it can be concluded that the application of AR in Fiqh learning not only improves students' understanding of the material, but also strengthens teachers' TPACK competencies in integrating technology with pedagogy and taught content. First, the use of AR in Fiqh learning, especially for Hajj material, has proven effective in clarifying the stages of worship that have been difficult to explain verbally or with traditional methods. The three-dimensional visualization offered by AR allows students to more easily understand and remember the steps of Hajj, making it a more interactive and enjoyable learning experience. This shows that AR can be a very effective tool in delivering material that is abstract and requires real visualization. Second, the implementation of AR in Fiqh learning also has a positive impact on teachers' TPACK

competencies. Teachers involved in this study showed improvement in their skills in using technology in learning, as they became more accustomed to integrating AR as part of their teaching methods. As a result, teachers were able to combine technology with teaching content (Fiqh) and appropriate pedagogical approaches, thus creating more effective and engaging learning.

Despite challenges related to the limitations of AR technology-enabled devices and the need for further training for teachers, the majority of teachers recognized that the use of AR enriched their teaching methods. This suggests that, with adequate support, AR can be a valuable tool to improve teachers' TPACK competencies, particularly in religious education. Overall, this study shows that the integration of AR in Fiqh learning has great potential to improve the quality of learning in Madrasahs, not only in terms of student understanding, but also in the development of teachers' TPACK competencies. Therefore, the use of AR technology in religious education needs to continue to be encouraged and expanded so that learning is increasingly relevant to technological developments and future educational needs. For future research, it is necessary to conduct further studies on the application of AR in other religious learning materials, such as zakat, fasting, or Islamic history. In addition, further research also needs to examine the long-term impact of using AR in learning, to find out whether the understanding gained by students can last for a long time.

REFERENCES

- Ajizah, Imroatul, and Muhammad Nurul Huda, 'TPACK AS A DEVICE FOR PAI TEACHERS IN THE ERA OF INDUSTRIAL REVOLUTION 4.0', *Ta'allum: Journal of Islamic Education*, 8.2 (2020), pp. 333-52, doi:10.21274/taalum.2020.8.2.333-352
- Ashari, Hilda, Elfira Makmur, Dessy Ana Laila Sari, Akhyar Muchtar, Muhammad Iswal Burhan, Makassar State University, and others, 'Augmented Reality (AR) Training to Improve Teacher Competencies in the Digital Era', *TEKNOVOKASI: Journal of Community Service*, 2.1 (2024) <<http://journal.unm.ac.id/index.php/TEKNOVOKASI>>
- Aslan, *Learning Fiqh in Madrasah Ibtidaiyah*, 1st edn (Feniks Muda Sejahtera, 2022), 1
- Belda-Medina, J, 'Integrating Augmented Reality in Language Learning: Pre-Service Teachers' Digital Competence and Attitudes through the TPACK Framework', *Education and Information Technologies*, 27.9 (2022), pp. 12123-46, doi:10.1007/s10639-022-11123-3
- Franchuk, Nataliia, Inna Karuk, Viktoriia Imber, Nadiia Komarivska, Natalia Kazmirchuk, and Tetiana Koval, 'Developing Future Primary School Teachers' Communication through

Pedagogy of Partnership', *Journal of Education and Learning (EduLearn)*, 18.3 (2024), pp. 607-15, doi:10.11591/edulearn.v18i3.21668

Hanik, Elya Umi, Dwiyantri Puspitasari, Emilia Safitri, Hema Rizkyana Firdaus, Maurin Pratiwi, and Reza Nidaul Innayah, 'Elya Umi Hanik et al Integration of TPACK (Technological, Pedagogical, Content Knowledge) Approach of SIKL Elementary School Teachers in Implementing Digital Era Learning', *JEID: Journal of Educational Integration and Development*, 2.1 (2022), p. 2022

Hisarma Saragih, Stimson Hutagalung, Arin Tentrem Mawati Dina Chamidah, Muh. Fihris Khalik, Sahri, Paulina Wula Bonaraja Purba, and others, *Philosophy of Education*, ed. by Abdul Karim, 1st edn (Yayasan Kita Menulis, 2021), 1

Ira Mahartika, Iwan, Sutrisno, Arif Dwinanto Nurul Mahruzah Yulia, Andryanto. A, Nur Mustika Huzaima Mas'ud, Sudirman, Dina Chamidah Janner Simarmata, Neti Afrianis, *Augmented Reality Based Learning Media*, ed. by Abdul Karim, 1st edn (Yayasan Kita Menulis, 2023), 1

Maulana, Indra, and Hafis Ramadhan Setiawan, 'Training on Making Augmented Reality-Based Learning Media with the Assemblr Edu Platform', *JAMU: Journal of Abdi Masyarakat UMUS*, 5.01 (2024), pp. 12-19.

Musdalifa Musdalifa, and Ariantje Dimpudus, 'Integration of TPACK (Technological, Pedagogical, and Content Knowledge) in Learning Mathematics Algebraic Forms', *Arjuna Journal: Publication of Education, Language and Mathematics*, 2.3 (2024), pp. 266-75, doi:10.61132/arjuna.v2i3.877

Noviansyah, Wahyu, A G Tamrin, Taufiq Lilo Adisucipto, and Anis Rahmawati, 'ENHANCEMENT OF TEACHER COMPETENCIES IN DESIGNING BIM-BASED AUGMENTED REALITY MEDIA', *BERNAS: Journal of Community Service*, 3.4 (2022), pp. 640-47, doi:10.31949/jb.v3i4.3096

Nur Hidayat, Wildan, Eko Purnomo, and Noor Aziz, 'Technological Pedagogical and Content Knowledge (TPACK) in Islamic Religious Education in the Digital Era', *JOURNAL OF EDUCATION*, 4.1 (2023), pp. 93-106.

Nurhasibah, Ilma, Al Mudarisah, and Abdul Syukur, *Introduction of Augmented Reality Technology as an Effort to Protect Children's Rights from Technological Development in Jatisari Village, Cisompet District, 2021*
<<https://proceedings.uinsgd.ac.id/index.php/Proceedings>>

Permatasakti, Damba, and Vera Jenny Basiroen, 'Experimental Design: Javanese Folktale Preservation Using Augmented Reality Technology', *Humaniora*, 9.3 (2018), p. 265, doi:10.21512/humaniora.v9i3.4501

Rabba, Aspasia Stacey, Cheryl Dissanayake, and Josephine Barbaro, 'Development of a Web-Based Resource for Parents of Young Children Newly Diagnosed with Autism: Participatory Research Design', *JMIR Pediatrics and Parenting*, 3.2 (2020), doi:10.2196/15786

Rahmatiah, Rindu, Muhammad Sarjan, Agus Muliadi, Asrorul Azizi, Hamidi Hamidi, Iswari Fauzi, and others, 'TPACK (Technological Pedagogical Content Knowledge) Framework in the Philosophy of Science Perspective to Welcome Future Education', *Scientific Journal of Education Profession*, 7.4 (2022), doi:10.29303/jipp.v7i4.1069

Rahmatullah, Basith, and Irma Kadarwati, 'Improving Teachers' TPACK Competencies Through Augmented Reality-Based Learning Media Development Training', *JPMN Jurnal Pengabdian Masyarakat Nusantara*, 3.2 (2023), pp. 125-36, doi:10.35870/jpmn.v3i2.1856

Rahmawati, Asri, Sandi Budiana, and Hida Wahida Chusen, 'IMPROVING STUDENT LEARNING RESULTS THROUGH THE TPACK APPROACH ASSISTED WITH AUGMENTED REALITY MEDIA CLASS V SD'.

Swan Pangesti, June, *The Role of Fiqh Teachers in Increasing Student Learning Motivation in Fiqh Subjects at SMP Islam Amanah Ummah Mojolaban Sukoharjo*, *Educational Journal*, 2023, XII <<https://jurnaldidaktika.org505>>

Yustitia, Via, and Nia Kania, *EDUCATION IN THE DIGITAL ERA*, 2024 <<https://www.researchgate.net/publication/378494193>>