



Implementation of Technology-Based Learning Media in Islamic Religious Education Learning at SMA Stabat

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ABSTRACT

This study aims to explore the implementation of technology-based learning media, the obstacles faced by teachers, and the strategies they employ in utilizing such media in Islamic Religious Education (PAI) learning at SMA Stabat. This research uses a descriptive qualitative approach with Islamic Religious Education teachers from SMA Negeri 1 Stabat and SMA Swasta Persiapan Stabat as the subjects. Data were collected through observation, interviews, and documentation, then analyzed descriptively. The findings show that PAI teachers at SMA Negeri 1 Stabat have effectively integrated various digital media such as PowerPoint, instructional videos, YouTube, Quizizz, and Google Classroom to enhance students' participation and understanding. Meanwhile, teachers at SMA Swasta Persiapan Stabat utilized simpler media such as PowerPoint, offline videos, and audio recordings of Qur'anic recitations (murottal) according to the available resources. The main obstacles in implementation include limited technological facilities, low digital literacy among teachers, and unstable internet connections. To overcome these challenges, teachers participated in training, engaged in self-directed learning, and innovated in using offline-based media.

1. Introduction

The success of implementing technological media in Islamic Religious Education (PAI) learning largely depends on the teacher's skills. Teachers are required not only to master the subject matter but also to be proficient in selecting appropriate media that align with students' characteristics and classroom conditions. If the selection of media is not appropriate, the learning objectives may be disrupted. However, the implementation of technology-based learning media in PAI is not free from various challenges. Teachers are also required to possess digital literacy skills, while not all teachers are prepared or skilled in utilizing technology. On the other hand, limited facilities, such as devices and internet networks, often become obstacles in the implementation of learning. Teacher competence, school infrastructure, and student readiness are key determinants of the successful implementation of technology-based media in PAI learning. (Agustian & Salsabila, 2021; Aji Silmi & Hamid, 2023).

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The researcher conducted preliminary observations at SMA Negeri 1 Stabat and SMA Swasta Persiapan Stabat. The results of these initial observations in the two schools indicate that the use of technology-based learning media has begun to be implemented, although it has not been evenly applied in all classes. Some teachers have attempted to use digital media such as presentations or videos, but their utilization is still limited. The main obstacles encountered are the inadequate skills of teachers and the lack of facilities such as LCD projectors, computers, and stable internet networks. As a result, technology-based learning has not yet been implemented optimally. (Febriani et al., 2023).

Meanwhile, at SMA Swasta Persiapan Stabat, an interesting phenomenon was found, namely the existence of a class referred to as a VIP class. In this class, all learning activities are already technology-based with the support of complete facilities and teachers who are competent in using digital devices. This makes the learning process in the VIP class more interactive and modern compared to regular classes. This phenomenon indicates a gap in the implementation of technology between classes within the same school. In contrast, in regular classes, learning is still largely conducted in a traditional manner because some teachers are not yet accustomed to using technological devices. Limited facilities also make it difficult to implement digital media. Teacher competence and limited facilities are the main inhibiting factors in the use of technological media for PAI learning. (Setiawan et al., 2025). These findings confirm that the implementation of technology-based learning media in schools still faces various challenges.

Based on these conditions, research on the implementation of technology-based learning media in the PAI subject at SMA Stabat is highly relevant to be conducted. This research is expected to provide an overview of the extent to which technology has been implemented in PAI learning, the obstacles that arise, and the solutions pursued by teachers in dealing with these challenges. Thus, the results of this research can contribute to creating more creative and innovative learning strategies. In addition, this research is also important as an evaluation material for schools and teachers. Teachers can gain new insights into appropriate methods and media, while schools can use it as a reference to improve facilities and support teachers in mastering digital skills.

This research also has both academic and practical urgency. Academically, this research contributes to the body of scientific studies on the implementation of technology-based learning media in the context of PAI at the senior high school level. Practically, the research findings can serve as a guideline for teachers in improving their digital skills, as well as for schools in designing policies that better support learning transformation. Therefore, this research is expected to provide a positive impact not only for teachers and students but also for the broader development of the quality of Islamic education. (Mardiah et al., 2025).

The role of technology-based learning media in Islamic Religious Education (PAI) learning is not merely as a supporting tool, but also as a means of internalizing Islamic values in a more contextual and engaging way. Through digital media, students can understand religious teachings through visual, audio, and interactive approaches, making them easier to comprehend and apply in daily life. The implementation of technology-based learning media in PAI requires teachers' readiness, both in terms of pedagogical skills and technological competence. (Putra et al., 2024). Teachers are required to be able to design innovative learning strategies by utilizing various applications such as Google Classroom, Kahoot, and other interactive media to increase student engagement.

Islamic Religious Education aims to instill Islamic values through educational and developmental processes, as well as to equip students with the ability to understand and practice Islamic teachings in their daily lives. The rapid development of technology has brought significant impacts on the field of education, including the learning process of Islamic Religious Education (PAI)

at the senior high school (SMA) level. In this context, the application of technology-based media has become one of the strategies that can enhance the effectiveness and attractiveness of PAI learning, particularly in the Langkat region. However, the success of integrating technology into PAI learning largely depends on the role of the school principal as the main leader within the school environment.

The implementation of technology-based learning media in PAI learning at senior high schools also has great potential in supporting the development of students' character. Technology can facilitate a deeper understanding of religious values if it is used appropriately and purposefully. (Rahma & Mufidah, 2025). However, it is important for school principals to ensure that the use of technology does not diminish the spiritual essence of the PAI learning process, but rather strengthens it.

Based on the explanation above, research on the implementation of technology-based learning media in PAI learning is very important to conduct. This study will provide a clear picture of the extent to which the implementation has been carried out, what obstacles teachers face, and what solutions are used to overcome these challenges. Through this research, it is expected that appropriate and sustainable implementation patterns can be identified in order to improve the quality of PAI learning at SMA Stabat.

2. Methodology

This study employs a qualitative research method. The researcher focuses on the implementation of technology-based learning media in Islamic Religious Education (PAI) learning. To achieve the objectives of this study, the researcher decided to use a research method with a case study approach. The main focus of case study research is the case itself, as the purpose of this research is to identify what is unique or distinctive about the case. Cases can be found in almost all fields. Therefore, all aspects related to the case such as its natural characteristics, activities, functions, history, environmental conditions, and various other factors that relate to and influence the case must be examined to provide a comprehensive explanation and understanding of the existence of the case.

The researcher decided to select two different educational institutions as the research locations. The first research site is SMA Negeri 1 Stabat, located at Jl. Proklamasi No. 3 Abadijaya, Kwala Bingai, Stabat District, Langkat Regency, North Sumatra. In addition, the research was also conducted at SMA Swasta Persiapan Stabat, located in Pantai Gemi, Stabat District, Langkat Regency, North Sumatra.

In this study, there are two types of data sources, namely primary data sources and secondary data sources. The primary data were obtained through interviews with two Islamic Religious Education (PAI) teachers from the two schools. Meanwhile, the secondary data sources in this research were obtained from existing materials such as reports, documents, books, scientific articles, archives, and other relevant sources to be analyzed and utilized in the study.

The data collection techniques used in this study include observation, documentation, and interviews. In this research, the data analysis techniques consist of data reduction, data presentation, and conclusion drawing. After the researcher completed the research and obtained the conclusions, the validity of the data was tested using the triangulation technique.

3. Results

3.1 Implementation of Technology-Based Learning Media in Islamic Religious Education

The implementation of technology-based learning in Islamic Religious Education (PAI) in both schools reflects the main principles of constructivist theory, namely that knowledge is actively constructed by students through interaction and meaningful learning experiences. In practice, teachers use digital media such as videos, animations, and visual presentations to stimulate students' thinking and help them connect religious concepts with the realities of everyday life. Tuti Lestari, a teacher at SMA Negeri 1 Stabat, explained that she often shows videos depicting commendable behavior so that students can observe concrete examples. This approach is in line with the view of Jean Piaget, who emphasized that the learning process results from direct experiences processed through reflection. By watching and discussing videos, students do not merely receive information but also build moral understanding and Islamic values through active thinking processes. (Mahbuddin, 2020; Ikhsan, 2024).

In addition, this approach is also consistent with Vygotsky's theory of the zone of proximal development, in which teachers act as facilitators who provide support (scaffolding) to help students develop their thinking abilities. In this context, teachers utilize technology as a tool to expand opportunities for interaction and collaboration in the classroom. Group discussions after watching videos or completing interactive quizzes encourage students to share perspectives, deepen meaning, and socially construct awareness of religious values. (Khumaidah & Nu'man, 2021; Sapura, 2024). Therefore, the application of technology-based learning media in PAI not only enriches the methods of delivering material but also strengthens constructivist principles, where students become active participants in constructing spiritual and moral knowledge.

The research findings indicate that the use of technology-based learning media can increase students' attention, motivation, and understanding of PAI materials. These findings are consistent with the multimedia learning theory proposed by Richard E. Mayer, which states that the learning process becomes more effective when information is presented through a combination of text, images, sound, and video, a concept known as dual-channel processing. Muhtar, a teacher, explained that by displaying videos about Islamic history or PowerPoint presentations containing images and quotations from the Qur'an, students become more focused and enthusiastic during the lesson. (Wahyudi et al., 2023; Rahmani et al., 2025). Meanwhile, a student named Dirga stated that learning using a projector makes it "easier to remember and less boring."

These findings demonstrate that the use of digital media helps the learning process operate through the two main channels of the brain visual and verbal. When teachers explain the material while displaying images or videos, students can more easily understand the relationship between religious concepts and real-life situations. In addition, digital media can reduce learning boredom because students are not only listening but also seeing, reading, and visually interacting with the material. Therefore, the implementation of technology-based learning in the PAI subject in both schools confirms the effectiveness of Mayer's theory. The use of digital media not only clarifies the content of instructional messages but also increases students' interest and knowledge retention. This is in line with the principle that technology should function as a cognitive tool that strengthens the understanding of spiritual and moral concepts in Islam. (Hakim, 2025; Setiawan et al., 2025).

3.2 Challenges and Solutions in the Implementation of Technology-Based Learning Media in Islamic Religious Education (PAI) Learning

Based on the results of the study, it was found that the implementation of technology-based learning media in Islamic Religious Education (PAI) learning still faces several obstacles that affect the effectiveness of the learning process. These obstacles can generally be classified into two main

categories: technical barriers and non-technical barriers. Both types of barriers are interconnected and influence the optimization of technology utilization in learning activities.

Technical barriers are related to the limitations of facilities and infrastructure that support technology-based learning. In this study, the most common technical obstacles include limited devices such as projectors, laptops, and unstable internet connections. These conditions are more frequently experienced by teachers at SMA Swasta Persiapan Stabat. Based on interview results, Intan Maya Sari and Teacher D explained that technological facilities at the school are still limited, so the use of digital learning media cannot be implemented optimally in every meeting. The limited availability of devices requires teachers to take turns using existing facilities or even utilize their personal devices to support the learning process. (Agustian & Salsabila, 2021; Putra et al., 2024).

In contrast, at SMA Negeri 1 Stabat, technical barriers are not as dominant because the school facilities are relatively more adequate. However, obstacles still arise in the form of occasionally unstable internet network conditions. (Febriani et al., 2023; Sapura, 2024). Weak internet connections can hinder access to digital learning resources such as instructional videos, online learning applications, and web-based platforms used in the PAI learning process. This situation indicates that the availability of technological infrastructure is an important factor in supporting the successful integration of technology in learning.

In addition to technical barriers, this study also found non-technical barriers related to human resource factors, both from teachers and students. The most prominent non-technical obstacles include teachers' limited ability to operate learning technologies, the lack of continuous training related to the use of digital media, and the low readiness of some students to utilize technology as a learning tool. For example, Teacher M. Sukri Masuti admitted that he does not yet fully possess sufficient basic technological skills to independently develop digital learning media. This condition indicates that improving teachers' digital competence remains an important need in the era of technology-based learning.

On the other hand, obstacles also arise from student-related factors. Not all students possess adequate personal digital devices such as smartphones or laptops to access technology-based learning materials. In addition, limited internet data quotas also become a challenge for some students in participating in online learning or accessing digital materials provided by teachers. This condition shows that digital literacy and access to technology within the school environment are still uneven, thus requiring special attention from schools as well as educational policymakers. (Irma, 2025; Mardiah et al., 2025).

Despite facing these various obstacles, teachers continue to seek adaptive solutions so that the learning process can still run effectively. Several teachers take the initiative to prepare learning media that can be used offline, such as previously downloaded instructional videos, PowerPoint presentations, and visual materials that can be displayed without requiring an internet connection. Tuti Lestari and Muhtar, for example, take advantage of technology training provided by the school to improve their ability to integrate technology into PAI learning.

In addition, teachers also utilize technologies that are most easily accessible to students, such as message-based communication applications. Intan Maya Sari uses her personal device to develop digital learning media and utilizes the class WhatsApp group as a platform to distribute learning materials, instructional videos, and assignments to students. This strategy is considered quite effective because almost all students have access to the application, allowing communication and the delivery of learning materials to continue despite the limitations of school facilities. (Sumin, Salleh, & Nurdin, 2021).

The efforts made by these teachers demonstrate initiative, creativity, and adaptability in addressing the challenges of implementing technology in learning. This also confirms that the success

of implementing technology-based learning media is not determined solely by the availability of facilities or infrastructure support, but is also strongly influenced by teachers' commitment, motivation, and readiness to continue innovating in the learning process.

Overall, the findings of this study indicate that the barriers to implementing technology-based learning media constitute a complex phenomenon involving various factors, both technical and non-technical. Nevertheless, through the creativity, perseverance, and innovative spirit of teachers, many of these limitations can be addressed through adaptive strategies. Therefore, the integration of technology in PAI learning can still provide positive contributions to improving the quality of learning and encouraging the creation of a more engaging, interactive, and relevant learning process in accordance with the development of the times.

3.3 Teachers' Ability in Using Technology-Based Learning Media in Islamic Religious Education (PAI) Learning

Teacher competence is one of the key factors in determining the effectiveness of using technology-based learning media in the learning process. Teachers not only act as conveyors of knowledge but also as facilitators who are able to utilize various learning resources and technologies to create engaging, interactive, and meaningful learning experiences for students. In the context of Islamic Religious Education (PAI), the use of technology has great potential to assist teachers in conveying religious values in a more contextual manner through visualization, simulations, and interactive digital media. (Agustian & Salsabila, 2021; Setiawan et al., 2025).

Based on the results of the interviews conducted in this study, teachers' ability to utilize technology-based learning media can be classified into three main categories: high competence, moderate competence, and low competence.

First, high competence, demonstrated by teachers such as Tuti Lestari and Muhtar. These teachers are able to actively and systematically integrate various digital media into the learning process. They not only use presentation media such as PowerPoint but also utilize instructional videos, illustrative images, and other digital learning resources relevant to PAI materials. The use of these media is designed systematically to support the achievement of learning objectives, allowing students to understand the material in a more concrete and engaging manner. This ability indicates that the teachers possess a relatively good level of digital literacy and are able to adapt technology as an integral part of their learning strategies. (Supriyadi & Anshori, 2024; Wahyudi et al., 2023).

Second, moderate competence, demonstrated by teachers such as Intan Maya Sari. Teachers in this category have utilized technological media in learning, such as PowerPoint presentations and instructional videos. However, the use of technology is still limited to presentational media and has not yet included the use of interactive learning applications or more complex digital platforms. Nevertheless, these efforts indicate an awareness of the importance of technology in learning as well as a willingness to continue developing professional competence.

Third, low competence, demonstrated by teacher M. Sukri Masuti. Teachers in this category have not yet utilized digital media in the learning process due to limited technological knowledge and the lack of supporting facilities. The learning process is still dominated by conventional methods such as lectures and the use of textbooks. This condition indicates that the gap in digital literacy among teachers remains a challenge in the implementation of technology-based learning. (Ikhsan, 2024; Sapura, 2024).

The analysis of these findings shows that teachers' ability to utilize technology is strongly correlated with several important factors, such as participation in training programs, the availability of school facilities and infrastructure, and teachers' personal motivation to continue learning and innovating. Teachers who actively participate in educational technology training and receive

adequate facility support tend to have better digital competence compared to those who do not have such opportunities.

In addition to training and institutional support, teachers' internal motivation also plays a very significant role in the development of technological competence. This can be seen in the attitude of teachers such as Intan Maya Sari, who demonstrates a strong spirit of independent learning despite facing limitations in facilities. The teacher continues to utilize available technology and even uses personal devices to support the learning process. This attitude is consistent with the concept of self-directed learning proposed by Malcolm Knowles (1980), which emphasizes that individuals who possess initiative in independent learning are more capable of continuously developing their professional competence.

Conversely, the situation experienced by teacher M. Sukri Masuti indicates that without self-directed learning motivation or institutional policy support, the development of teachers' technological competence will progress more slowly. Therefore, intervention from the school is required in the form of structured training programs, peer mentoring among teachers, and policies that encourage the use of technology in the learning process. (Putra et al., 2024; Mardhiah et al., 2025).

Teachers' ability to utilize learning technology also has a direct influence on students' learning motivation and participation. Interviews with several students indicate that PAI learning that incorporates technological media can increase their interest in learning. Students who attend classes taught by teachers such as Tuti Lestari and Muhtar admitted that they are more enthusiastic in participating in lessons because the material is delivered through videos, images, and engaging presentations. These digital media help students understand Islamic concepts more clearly and concretely, allowing Islamic values to be comprehended more deeply.

In contrast, students who experience conventional teaching methods tend to feel bored more quickly due to the lack of variation in the delivery of learning materials. Monotonous lecture methods make students less actively involved in the learning process. This condition indicates a fairly strong relationship between teachers' ability to utilize learning technology and students' learning motivation. Digital learning media not only function as visual aids but also enhance students' emotional and cognitive engagement in the learning process. (Supriadi & Susilawati, 2024).

Overall, the results of this study indicate that the implementation of technology-based learning media in the PAI subject at SMA Negeri 1 Stabat and SMA Swasta Persiapan Stabat has begun to be applied, although the level of implementation is not yet evenly distributed. Public schools have advantages in terms of the availability of facilities and access to technological training for teachers, while private schools still face various challenges related to limited infrastructure and teachers' digital competence.

Nevertheless, both public and private schools demonstrate a strong spirit of change. Teachers strive to utilize technology according to their abilities and the available facilities, while students show positive responses to these learning innovations. This indicates that technology-based PAI learning has great potential to improve the quality of education if it is supported by school policies that favor the development of educational technology, continuous teacher training programs, and the enhancement of digital literacy among all members of the school community.

The findings of this study also reinforce the view that the success of the transformation of Islamic education in the digital era does not depend solely on the availability of technology but also on the quality of the human resources who utilize it. Creative, reflective, and open-minded teachers will be able to use technology as a medium for conveying Islamic values in a more contextual, engaging, and relevant manner to the lives of today's generation. Therefore, strengthening teachers' competence in learning technology is a strategic step that needs to be carried out continuously to

ensure that Islamic religious education remains capable of responding to the challenges of contemporary developments.

4. Conclusions

Based on the findings and the explanation of the research results and discussion, several conclusions can be drawn:

1. The implementation of technology-based learning media in the PAI subject at SMA Stabat generally runs quite well, although the level of implementation differs between public and private schools. PAI teachers at SMA Negeri 1 Stabat have utilized various digital media such as PowerPoint, instructional videos, YouTube, Quizizz, and Google Classroom, which have been able to increase students' interest and active participation in the learning process. Meanwhile, PAI teachers at SMA Swasta Persiapan Stabat adapt technology-based learning to the limitations of available facilities through the use of PowerPoint presentations, offline videos, and murottal audio recitations.
2. Teachers face various obstacles in technology-based learning, such as limited facilities and infrastructure, low digital skills among teachers, unstable internet connections, and limited technical support as well as continuous training. These challenges are more prominent at SMA Swasta Persiapan Stabat, while at SMA Negeri 1 Stabat the obstacles are generally technical in nature, such as network disruptions and limited time for the use of digital media. To address these challenges, teachers improve their competence through training and self-directed learning, utilize simple and alternative offline-based media, and implement learning innovations to maintain interactive learning without heavy reliance on internet connectivity.
3. The ability of PAI teachers at SMA Stabat to utilize technology-based learning media can be considered good and continues to develop. Teachers have been able to use visual, audio, and audio-visual media, as well as digital applications such as Google Classroom, Quizizz, and Google Forms to support learning and evaluation processes. PAI teachers at SMA Negeri 1 Stabat tend to have higher digital literacy due to the support of better facilities and training opportunities, while teachers at private schools continue to develop their technological competence through independent efforts and adaptation to existing limitations.

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