EDUKASIA: Jurnal Pendidikan dan Pembelajaran
Vol. 6, 1 (June, 2025), pp. 133-148
ISSN: 2721-1150; EISSN: 2721-1169; DOI: 10.62775/edukasia.v6i1.1405

Digital Islamic Education Learning in Secondary Schools: Educational Quality and Student Engagement

Ardillah Abu[1], Firdiansyah Alhabsyi[2], Ruslin Ruslin[3], Hijrah Syam[4], Muhammad Arman[5], Andi Muh. Suktomansyah[6], Mudaimin Mudaimin[7]

[1] Datokarama State Islamic University, Palu, Indonesia; ardillahabu@uindatokarama.ac.id
[2] Datokarama State Islamic University, Palu, Indonesia; firdiansyahalhabsyi@uindatokarama.ac.id
[3] Datokarama State Islamic University, Palu, Indonesia; ruslin@uindatokarama.ac.id
[4] Datokarama State Islamic University, Palu, Indonesia; hijrasyam@uindatokarama.ac.id
[5] Datokarama State Islamic University, Palu, Indonesia; muharman@uindatokarama.ac.id
[6] Datokarama State Islamic University, Palu, Indonesia; andimuhsuktomansyah@uindatokarama.ac.id
[7] Datokarama State Islamic University, Palu, Indonesia; mudaimin@uindatokarama.ac.id

ARTICLE INFO

Keywords:

Digital Learning;
Islamic Education;
Educational Quality;
Student Engagement

Article history:

Received 2025-03-20
Revised 2025-05-23
Accepted 2025-06-06

ABSTRACT

The integration of technology into Islamic Education (PAI) in secondary schools encounters challenges such as limited facilities and low digital competence. This study analyzes implementation strategies, supporting and inhibiting factors, and the impact of digital-based PAI learning on student quality in Central Sulawesi. A descriptive qualitative approach was used with data collected through participatory observation, in-depth interviews, and document analysis. Informants included three principals, three PAI teachers, and three students from three schools. Data analysis involved reduction, visualization with N-Vivo software, and validation with informants. The findings show that strategies include principals' roles in policymaking and supervision, the use of educational videos, the Canva application, and the TPACK (Technological Pedagogical Content Knowledge) model. Supporting factors are leadership support, teacher readiness, and student enthusiasm. Key obstacles are limited technological devices, low teacher digital literacy, and restricted internet access. Digital-based PAI learning improves students' digital skills, enhances learning outcomes, and strengthens critical thinking. The study concludes that with appropriate strategies and adequate resources, digital-based PAI learning can enhance student competencies. It recommends providing digital literacy training for teachers, ensuring adequate technological infrastructure, and reinforcing digital learning concepts to optimize Islamic Education in secondary schools.

Corresponding Author:
Ardillah Abu
Datokarama State Islamic University, Palu, Indonesia; ardillahabu@uindatokarama.ac.id

1. INTRODUCTION

In Indonesia's education system, Islamic Education (PAI) has long played a very important role. This subject is believed to help students develop individual character and morality (Lubis, 2018);

(Baharun & Ummah, 2018); (Muis et al., 2022), Especially in the context of an increasingly modern and digitally connected society. As noted in Indonesia's education system, as implemented in the curriculum, particularly in public schools managed by the Ministry of Education and Research, this subject is allocated very limited time, namely 2 x 45 minutes per week. (Pohan & Dafit, 2021); (Assa'idi, 2021). However, this limited time places significant demands on Islamic Education (PAI) teachers to accommodate the school's critical role in building students' character and morality in a responsible and accountable manner.

In this digital era, the development of information and communication technology undoubtedly offers great opportunities to enhance the effectiveness of Islamic Education (PAI) learning through the implementation of various digital-based solutions (Ferri et al., 2020); (Hasanah et al., 2021); (Nurqozin & Putra, 2023). At the same time, the potential offered by the digital era to our society, including students at all levels of education, can also create challenges in terms of individual morality and character (Boulton et al., 2015).

Over the past two decades, digital-based learning approaches have demonstrated positive impacts in various fields of education (Ismiyati et al., 2022); (Nasaruddin & Ladiqi, 2023). However, in the context of Islamic Education, there are still limitations in the implementation of this technology. Several fundamental reasons can serve as the basis for why this research is necessary. First, the shift in educational paradigms has positioned digital-based learning as a burden for teachers, researchers, and observers of Islamic Education (Srikan et al., 2021); (Pane et al., 2023); (Hasanah et al., 2021); (Nurqozin & Putra, 2023). Currently, the learning paradigm has shifted towards more interactive, dynamic methods that are responsive to students' needs (Ossiannilsson et al., 2016). The implementation of digital-based Islamic Education (PAI) learning can meet these demands.

Another important premise is the improvement of learning quality. Here, the use of technology in Islamic Education (PAI) learning is expected to provide broader access to educational resources and enhance the quality of teaching materials (Caswell et al., 2008); (Saraya et al., 2023); (Fahmi et al., 2021); (Yumnah, 2021); (Djazilan & Hariani, 2022), and facilitate more engaging and effective teaching methods (Saraya et al., 2023). Third, active student engagement is essential in the digital era. As observed by many researchers, students are generally more responsive to learning that utilizes technology (Terrion & Aceti, 2012); (Preszler et al., 2007); (Nami & Vaezi, 2018);. Therefore, digital-based Islamic Education (PAI) learning will help students increase their engagement through the use of multimedia, educational games, and interactive platforms (Kharismatunisa, 2023).

Finally, contextual considerations must be given serious attention by Islamic Education (PAI) teachers. It is important to recognize that the context of Islamic education has its own unique characteristics that need to be considered when developing digital-based learning solutions. Therefore, it is essential to explore how technology can be effectively integrated into the context of Islamic Education learning (Zubairi et al., 2022 ; (Utama, 2022); (Hidayat et al., 2021); (Ruswandi et al., 2023), Teachers, researchers, and observers need to continuously review their practices to align with the needs of their students.

In the context of the Character-Building Development Center (CBDC) at BINUS University, the use of the SAMR digital learning theory aims to understand how a technology-based character development model can work more effectively. Here, as identified by Balontia and Iskandar (2022), BINUS University is required to adjust its methods to address the challenges posed by existing technological devices. The findings of this pre-observation research indicate that the use of technology to help students develop their character-building has reached the highest level in the SAMR digital learning theory. Here, students were found to be at a position where they can transform deep learning through technology. This means that technology is not only used to make learning activities more efficient and effective, but its presence also changes the very nature of learning itself. The implementation at this level (redefinition – transformation) can be seen in students' ability to design project-based Islamic Education learning, fostering connections and collaboration among students from various parts of the world. The realization of digital-based learning in this research

context is a virtual simulation that allows the exploration of complex concepts in Islamic Education learning.

The study by Salsabila and Mavianti (2022), in the context of Tadika Permata AlFarabi Daycare in Selangor, Malaysia, with 25 children aged 5–6 years, found that 72 percent of them were able to recall short surahs and daily prayer recitations each week. The main challenge the children faced in learning religious education material was the traditional teaching methods applied by Islamic education teachers. When students were introduced to digital-based learning materials, including audiovisual and animated learning types as stimuli to capture the children's attention, creative and imaginative thinking, as well as improved memorization skills, were clearly observed. With the increase in learning motivation due to digital-based learning modes, the children's cognitive abilities also improved in line with what they saw and heard during the learning sessions. Although both studies observe different contexts and participants, they both inform and inspire this proposed research regarding the need for religious education teachers to integrate technology into their curriculum, lesson plans, and teaching processes. The main difference in this proposed research is the broader scope of the issue concerning the integration of technology in Islamic Education learning. Additionally, since this study is a mixed-methods analysis, students' experiences at the selected high school, differences in digital learning preferences, class and cohort separation, and age differences will be fully explored. Thus, the broader issue of the need for digital-based Islamic Education learning will be thoroughly and clearly addressed.

Therefore, this study is proposed to thoroughly examine the implementation of digital-based Islamic Education (PAI) learning to improve the quality of education and student engagement. Through this research, it is hoped that concrete strategies and recommendations will be found to enhance the implementation of digital-based PAI learning, ensuring that Islamic education remains relevant and competitive in this digital era. Approaches to improving education quality and student engagement can be a strength if further developed with empirical data and new theoretical frameworks. Recent studies show that integrating technology in Islamic education not only increases student engagement but also strengthens their spiritual understanding. For example, a study by Hilman, (2025) found that the use of digital platforms in Islamic religious education can enhance student engagement through interactive learning experiences and customized content, enabling students to connect more personally and actively with Islamic teachings. Furthermore, research by Jayanegara et al., (2024) demonstrated that interactive learning methods significantly boost motivation and engagement among students in Islamic education at both elementary and secondary school levels. These findings highlight the importance of developing deeper learning approaches with up-to-date empirical data and new theoretical models to improve education quality and student engagement in Islamic education.

2. METHODS

This study focuses on the impact of digital-based Islamic Education learning on students' personal development and the quality of education in Palu City. The research was conducted in Palu City, Central Sulawesi, Indonesia, in 2023. This study is a qualitative research type with an emphasis on descriptive data, focusing on three aspects. First, the strategies implemented to achieve successful digital-based Islamic Education learning. Second, the supporting and inhibiting factors in the digital learning process. Third, the impact of digital-based learning on students' abilities.

This study highlights the positive contribution of utilizing digital technology in supporting the process of Islamic Education learning in the face of educational challenges in the modern era. The data in this study are derived from participatory observations and in-depth interviews with informants selected based on their level of understanding of the research topic, categorized as primary data. The informants in this study number 9, consisting of 3 school principals from secondary schools in Palu City, 3 Islamic Education teachers, and 3 students from these schools.

Furthermore, to support the primary data, the study also uses secondary data sourced from documents or literature related to the concept of digital-based learning. Additionally, data in this study were collected based on interview guidelines that had been formulated and modified into semi-structured interview guidelines, referring to the results of initial field observations. The researcher formulated several specific questions based on the expertise of each informant selected.

Table 1. Interview Guidelines

Informant	Interview Questions
School Principal	What is the role of the school principal in relation to digital-based Islamic Education (PAI) learning?
	What is your opinion about digital-based PAI learning in the classroom?
	What steps or strategies have you implemented to support the process of digital-based PAI learning in the classroom?
	In your opinion, how effective is the digital-based PAI learning conducted by teachers in the classroom? Has there been a significant improvement in the quality of education at the school and a positive change in students' attitudes?
	What are your expectations regarding the implementation of digital-based PAI learning in the classroom?
Theacher	In planning digital-based learning, what topics or materials do you prepare?
	What challenges have you encountered in designing digital-based learning?
	What factors support the planning of digital-based learning?
	What learning media do you use in the classroom when utilizing technology?
	What steps do you take to start digital-based PAI learning in the classroom?
	How do you condition the learning environment for digital-based learning to make it appealing to students?
	What are the obstacles and supporting factors in the implementation of digital-based PAI learning?
	How do students respond to digital-based PAI learning?
	In your opinion, can digital-based learning create a better PAI learning ecosystem in the future? Why?
	In your opinion, what are the strengths and weaknesses of digital-based PAI learning in the classroom?
	In your opinion, how do students perform in terms of learning outcomes related to digital-based PAI learning in the classroom?
	What are your expectations regarding digital-based PAI learning in the classroom?
	In your opinion, what significant impact has the implementation of digital-based PAI learning had in the classroom so far?

Student	What is your opinion on the implementation of digital-based PAI learning in the classroom?
	What model of digital-based PAI learning is applied by teachers in the classroom?
	How do teachers provide understanding of PAI learning through the use of digital media?
	What type of digital media is typically used by teachers in PAI learning in the classroom?
	Have you encountered any difficulties related to the process of digital-based PAI learning in the classroom?
	What benefits have you experienced from the digital-based PAI learning process?
	Are you more enthusiastic about learning in the classroom through the concept of digital-based learning?
	In your opinion, does the digital-based PAI learning concept in the classroom make it easier for you to understand the material?
	In your opinion, what are the strengths and weaknesses of the digital-based PAI learning process in the classroom?

In this study, there are three main steps undertaken to analyze the data that has been collected. First, data reduction, which involves classifying the data with a focus on the issues and topics of the research. Second, data display and presentation, where after classification, the data is visualized using N-Vivo Software to map the data comprehensively and elaborate further. Third, verification and conclusion drawing, where the verification technique used is to recheck the transcribed data by contacting and sending the transcription back to each informant. To draw conclusions, the step taken is to integrate all the data based on the research problem formulation.

3. FINDINGS AND DISCUSSIONS

The Strategy for Implementing Digital-Based Islamic Education Learning at the Secondary School Level in Central Sulawesi

The concept of education based on the utilization of technology is an educational innovation in Indonesia aimed at addressing the challenges of modern times. Several educational institutions, ranging from elementary schools to universities, have implemented digital-based education models, both in religious and general education institutions. Similarly, in secondary schools in Central Sulawesi, some educational institutions have adopted digital-based learning models, particularly in Islamic Education learning. The following are the research findings related to the strategies for implementing digital-based Islamic Education learning, which include the role of school principals, learning concepts, and learning media used by several educational institutions in Central Sulawesi, such as SMAN 4 Palu, SMAN 7 Palu, and SMKN 3 Sigi:

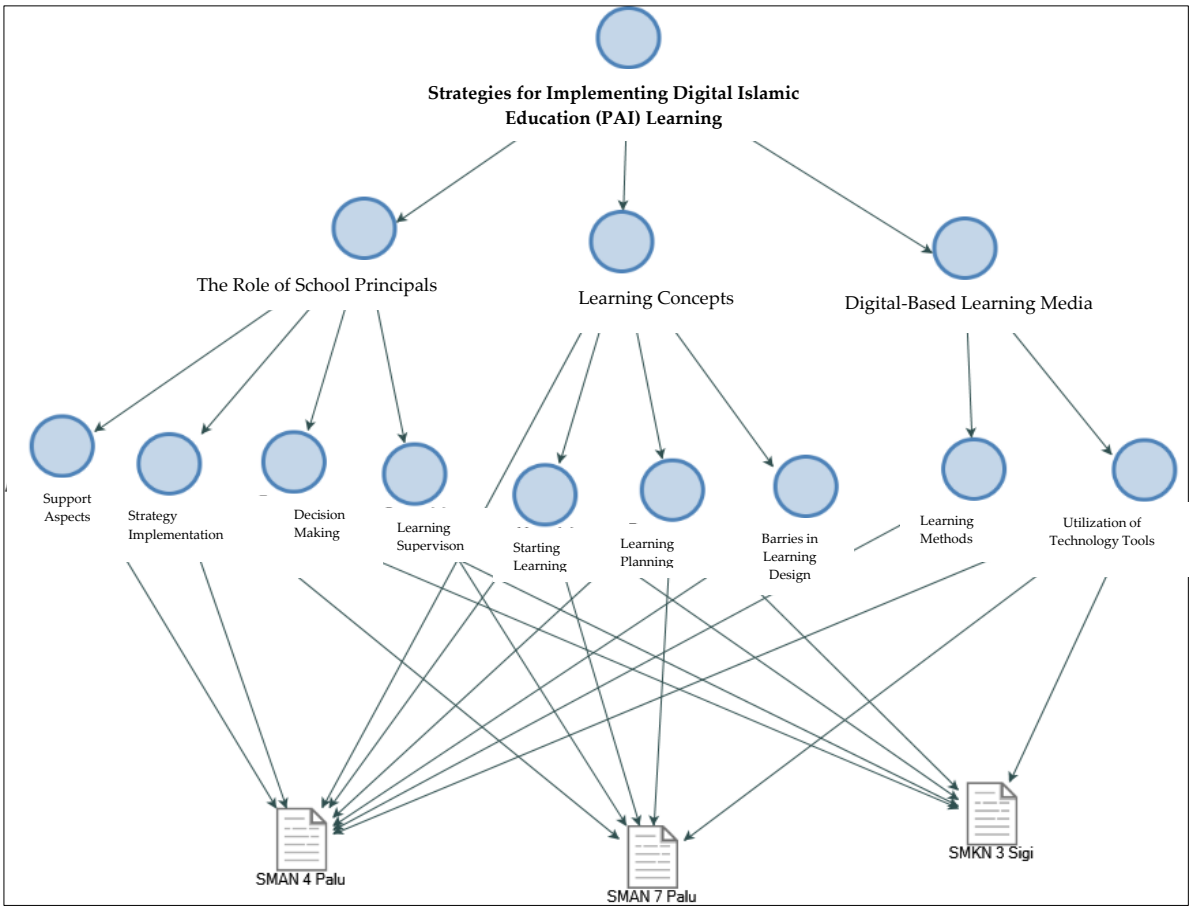

Figure 1. Strategies for Implementing Digital-Based Islamic Education Learning

Based on Figure 1, it is evident that the implementation of digital-based learning in secondary schools in Central Sulawesi highlights the significant role of school principals in achieving successful learning outcomes. This can be observed through the principal's involvement, ranging from providing support to supervising the learning process. For instance, SZ, the Principal of SMAN 4 Palu, actively participates in monitoring the implementation of digital-based Islamic Education learning.

"Digitalization-based Islamic Education learning is highly recommended in today's era. Moreover, it has become a necessity to avoid being left behind by the times, as it is undoubtedly a beneficial advancement."

In addition, a similar effort was carried out by the Principal of SMAN 7 Palu, who was also involved in formulating strategies to ensure the implementation of learning based on the utilization of digital technology. One of the steps taken was to enhance the school's facilities and infrastructure (SARPRAS), which are also part of the administrative requirements to remain in line with the school's learning SOPs. Furthermore, involving subject teachers, especially Islamic Education teachers, in every activity or training related to technology-based teaching was a concrete step taken to achieve the successful implementation of digital-based learning.

"The first strategy we implemented was improving the school's facilities and infrastructure, followed by involving Islamic Education teachers and all other teachers at our school in activities related to educational technology."

The strategy of implementing digital-based learning by involving teachers in every technology-based training serves as the main support for achieving successful learning outcomes. Essentially, school principals play a significant role and bear the responsibility of identifying the training needs of teachers to enhance their skills in using digital technology. This can be achieved through training

sessions, seminars, or workshops on integrating technology into learning. Moreover, the success of digital learning cannot be separated from the important role of the principal as a supervisor of learning and a policymaker. As a policymaker, the principal holds a strategic role in determining the direction and policies of the school, particularly in addressing modern educational challenges such as digital-based learning. This was also undertaken by N, the Principal of SMKN 3 Sigi, who engaged in the formulation of specific strategies tailored to the context and learning environment.

"As a policymaker in this educational institution, I strongly support digital-based learning. Digital Islamic Education learning is undoubtedly beneficial, but its suitability must be considered, as this medium makes learning more engaging and interactive. At SMKN 3 Sigi, expository and contextual learning strategies, the Value Clarification Technique, and direct learning strategies are suitable for implementation."

The role of school principals in the context of digital-based learning in schools serves as a key strategy. Principals, as the driving force behind digital transformation in schools, must have a clear vision of how technology can enhance the learning process and subsequently guide the entire school community to adapt to the changes taking place. In addition to the role of school principals as a strategy for realizing successful digital-based learning, another critical aspect is the formulation of digital-based learning concepts. In general, learning concepts are understood as approaches or frameworks that describe how the teaching and learning process takes place to help students achieve the desired understanding and skills. Learning involves interactions between teachers, students, instructional materials, and the learning environment aimed at developing knowledge, skills, attitudes, and values.

In the context of this research, learning concepts also serve as a strategy in implementing digital-based learning, covering teaching methods, lesson planning, learning evaluation, and overcoming challenges using technology. MS, a teacher at SMAN 4 Palu, in implementing digital-based learning, prepared specific concepts and methods to address the challenges of digital-based learning so that the objectives of learning could be achieved. This included formulating and modifying teaching materials to align with students' interests by integrating technology into the educational environment.

"The discussion of all types of material can be modified according to the needs of the students and the content requirements to achieve optimal goals. TPACK is one approach that can and should be used in Islamic Education learning in the modern era of the 21st century and beyond. As for the preparation in terms of facilities, it includes devices such as laptops/PCs, Android smartphones, and internet access, which are key supporting elements in digital learning."

Technological Pedagogical Content Knowledge (TPACK) is a conceptual framework that describes the skills required by educators to effectively integrate technology into teaching. In short, TPACK is the process of integrating content, pedagogy, and technology. Lesson planning through the TPACK framework serves as a foundational approach in formulating digital learning concepts based on students' interests. This indirectly fosters students' awareness of the importance of integrating technology and education, shaping individuals with advanced information and technology literacy skills.

Beyond lesson planning, starting the learning process is equally important when formulating digital-based learning concepts, as demonstrated by Islamic Education teachers at SMAN 7 Palu. These teachers implement several steps when starting lessons, such as setting clear learning objectives, observing classroom conditions to ensure a conducive learning environment, and ensuring the availability of technology that is accessible to students. This aligns with what Marc Prensky, an expert in education and technology, referred to as Information Access Efficiency, where digital-based learning enables students to gain wide and easy access to information, supporting a more independent and rapid learning process.

"What we do when starting lessons include setting clear learning objectives, understanding student characteristics while building initial commitment, preparing facilities, preparing human resources as implementers of the learning process, selecting appropriate gadgets, and choosing lightweight platforms."

However, challenges and obstacles are also encountered in implementing digital-based learning strategies, particularly in strengthening learning concepts, especially in the preparation and formulation of learning materials. This is closely related to the lack of learning facilities and infrastructure, particularly technological devices that support the learning process, as observed at SMAN 4 Palu.

"The obstacles in preparing digital-based learning are related to time and opportunities, as well as supporting facilities, particularly software or hardware."

Despite the challenges faced, the three schools have continued to implement digital-based Islamic Education learning concepts by utilizing simple and accessible technological tools. For instance, SMAN 4 Palu has managed to maintain a conducive digital learning process despite not yet having an E-Learning platform, which is one of the applications capable of supporting successful digital learning.

"Currently, our school does not yet have an E-Learning platform, so we still rely on applications that can periodically enhance knowledge and technology with clear results. For example, worksheets for student questions and assignments, Active Presenter for creating content such as videos (including CapCut, Filmora, and Bandicam). Canva, Gamma, and similar tools are used for creating presentation-related content, and for accessing content, photos, or social activities, we use a personal blog account or the MGMP PAI SMAN 4 Palu account. We also use Drive to store and upload completed assignments."

Meanwhile, SMKN 3 Sigi also utilizes relatively simple learning media, which is deemed to significantly impact the improvement of student learning quality and outcomes. The use of short videos and technology-based quizzes can enhance students' imagination, which gradually builds critical awareness. This critical awareness is a valuable asset for higher education levels. The choice of affordable learning media generally contributes positively to the digital learning process, particularly in schools in rural areas. Therefore, the implementation of the digital-based Islamic Education learning model in secondary schools in Palu City through the reinforcement of the Principal's role, the formulation of student-interest-oriented learning concepts, and the use of accessible technology that contributes to fostering students' critical awareness is a strategy that has been successfully implemented. This approach has brought positive impacts on both the quality of learning and students' learning outcomes.

This study shows that the success of implementing digital-based Islamic Education (PAI) learning in Central Sulawesi is influenced by three main factors: the role of the principal, the learning concept, and the utilization of technology-based learning media. The principals at SMAN 4 Palu, SMAN 7 Palu, and SMKN 3 Sigi played a significant role in supporting and monitoring the implementation of digital learning, which aligns with the research by Owen and Demb (2004), on the importance of leadership in technology-based education. The concept of digital-based learning is integrated using the TPACK (Technological Pedagogical Content Knowledge) approach, which has proven effective in enhancing student engagement and achieving learning objectives, as explained by Nofitri and Octoria (2024) the use of simple technology, such as ActivePresenter, Canva, and video creation applications at SMAN 4 Palu and SMKN 3 Sigi, has successfully enhanced students' creativity and critical thinking, in line with the findings of Al-Rahmi et al. (2021), regarding the influence of media in learning, however, challenges related to limited devices and internet access remain obstacles, as seen at SMAN 4 Palu, which aligns with the research Rosyidah and Juharyanto (2024), regarding the lack of infrastructure, however, these schools have still successfully implemented digital-based learning using accessible media. The active role of the school principals, the digital learning concepts aligned with students' interests, and the selection of relevant technology have been key to the success of digital-based Islamic Education (PAI) learning. Despite infrastructure challenges, the implementation of this model has proven effective in improving the quality of education.

Barriers and Supportive Factors in Digital-Based Learning Process

The success of digital-based Islamic Education (PAI) learning at the secondary school level in Central Sulawesi is also not free from its own challenges, both internal and external. The availability of facilities and infrastructure to support digital-based learning is one of the challenges and barriers in implementing digital-based education. However, there are also other aspects that support the implementation of digital-based learning. The implementation of digital-based learning in Central Sulawesi so far has also faced its own set of obstacles and challenges. Based on findings from the field regarding the digital-based Islamic Education learning process in three secondary schools in Central Sulawesi, several factors were identified as barriers to the digital learning process, including the limitations of digital devices, the understanding of stakeholders about information and technology literacy, and the still-limited internet access. Meanwhile, in addressing these barriers, several actions have been taken, such as designing the learning process by utilizing available technology while prioritizing students' preferences and creating a learning concept that is inclusive of students' conditions, regardless of their social status.

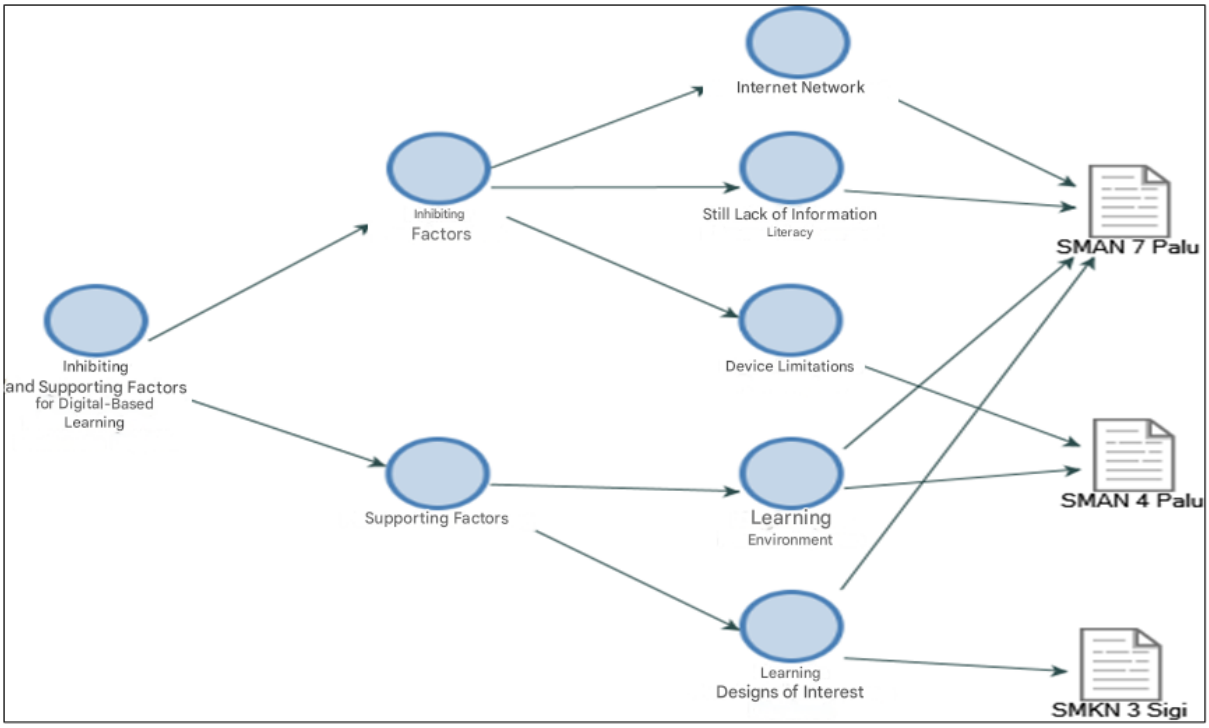

Figure 2. Challenges of Secondary Schools in Palu City in Digital-Based PAI Learning

Based on the figure above, it was found that there are several challenges faced by some secondary schools in Palu City in the process of implementing digital-based Islamic Religious Education (PAI) learning, such as in SMAN 7 Palu regarding the availability of internet access. The limited internet access for digital-based learning is undoubtedly a major challenge. The successful operation of technological devices, particularly in the context of learning, depends on the availability of a fast internet connection. This is crucial, as internet access is needed for operating learning support applications and delivering lessons in the classroom, ensuring that students can understand the learning material effectively.

In addition to the limited internet access at SMAN 7 Palu, another challenge that hinders the digital learning process is the lack of information and technology literacy among teachers. Information literacy refers to the ability to manage information properly, while technology literacy refers to an individual's ability to understand and operate digital devices. Both forms of literacy are essential for the successful implementation of technology-based learning. Meanwhile, significant

challenges also occur at SMAN 4 Palu and SMKN 3 Sigi, particularly the lack of technological devices to support digital-based learning and intermittent internet access, which negatively impacts the learning process and student learning outcomes.

In general, these obstacles in the implementation of digital-based learning are also felt by other secondary schools. Therefore, support for infrastructure, such as technology devices, internet access, and routine training to enhance the abilities of both teachers and students in using educational technology, are essential steps for educational stakeholders to take in order to achieve maximum success in technology-based learning. Moreover, the implementation of digital-based learning in secondary schools in Central Sulawesi also benefits from supportive aspects, as identified in this study, including a conducive learning environment and lesson designs that appeal to students. At SMAN 4 Palu, although there are still several challenges in implementing digital-based Islamic Religious Education, these can be minimized by utilizing available technological devices and reinforcing a conducive learning environment by applying learning concepts based on student interests. For example, students are encouraged to watch YouTube videos related to the lesson and given the opportunity to express their opinions about what they watched. Similarly, at SMKN 3 Sigi, students are given the space to learn through their mobile phones, with videos related to the lesson provided, and students are encouraged to elaborate and explore the content, which helps train their thinking skills and allows them to be more proactive in expressing their views.

The implementation of digital-based Islamic Religious Education in secondary schools in Central Sulawesi faces several significant challenges. Some of the obstacles include the lack of technological devices, limited understanding of information and technology literacy, and limited internet access. Nevertheless, these schools are making efforts to overcome these challenges by making the most of available technology and creating lesson designs that are more accommodating to the needs and interests of students. In this context, the SAMR (*Substitution, Augmentation, Modification, Redefinition*) theory can be used to understand how technology is being used in the learning process at these schools (Hamilton et al., 2016). At the substitution level, technology is used as a replacement for traditional learning tools without significantly changing the learning process (Savignano, 2017). For example, at SMAN 7 Palu, despite limited internet access, the use of applications like YouTube to replace textbooks has been helpful, although with less optimal quality.

At the augmentation level, technology begins to provide additional functionality that enhances learning. For example, at SMAN 4 Palu, despite the limited available devices, the use of educational videos followed by class discussions allows students to better understand the material and engage more actively. This helps create a more interactive learning environment. (Savignano, 2017).

At the modification level, technology enables significant changes in the way learning is conducted. At SMKN 3 Sigi, students are given the opportunity to learn using their own mobile phones, watch educational videos, and then discuss the material they have viewed. This provides students with space to think more critically and become more active in expressing their opinions (Crompton & Burke, 2020). Although the redefinition level, which involves using technology to create entirely new learning experiences, has not yet been fully achieved, the use of applications like Google Drive and Canva for collaboration and content creation is a step toward this goal. It allows students to work together and create more creative learning products (Hamilton et al., 2016).

Through the SAMR approach, it can be seen that despite many challenges in implementing digital-based learning, technology can still be used effectively at various levels to enhance the learning experience and outcomes. Although limited, the available technology can enrich learning, as long as the learning design is adapted to the conditions and needs of the students. In this way, despite many obstacles, technology can still be used to support the achievement of better learning outcomes in secondary schools in Central Sulawesi.

The Impact of Digital-Based Islamic Education Learning on the Development of Student Quality in Schools

In general, Islamic Education learning through the use of digital technology can have an impact on the quality of students in schools. These impacts consist of both positive and negative effects. In this regard, the following are some of the research findings related to the impact of digital-based learning on the improvement of student quality at SMAN 7 Palu, SMAN 4 Palu, and SMKN 3 Sigi. Several positive impacts were identified, including: a more enjoyable learning environment, students becoming proficient in using digital media, improved student learning outcomes, positive changes in students' attitudes and behavior, and a new learning ecosystem.

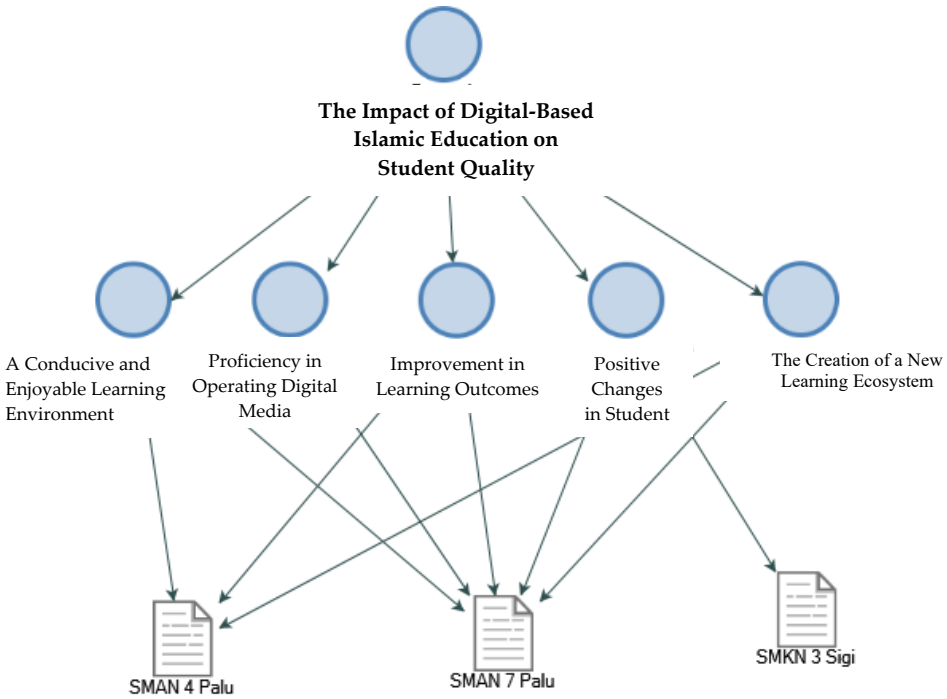

Figure 3. The Impact of Implementing Islamic Education Learning on the Improvement of Student Quality.

The findings of this study indicate that the implementation strategy of digital-based Islamic Education (PAI) learning at the secondary school level in Central Sulawesi involves three main aspects: the role of school principals, learning concepts, and the utilization of technology-based media. These three aspects contribute significantly to the success of the learning process, despite facing challenges related to limited infrastructure and technological literacy. A proactive role of school principals, the development of learning concepts oriented toward students' interests, as well as the use of easily accessible media such as ActivePresenter, Canva, YouTube, and Google Drive, are key factors in enhancing student engagement and learning outcomes. However, when examined more deeply within the context of global literature, it appears that this study is still dominated by local and normative references, which have not fully engaged with the latest developments in international research related to digital pedagogy, Islamic education, and student engagement. The emphasis on the role of school principals and the strengthening of learning concepts based on the TPACK (Technological Pedagogical Content Knowledge) framework is consistent with the findings of Owen & Demb, (2004) and Nofitri & Octoria, (2024), but remains limited in linking it to broader theoretical frameworks such as Digital Islamic Pedagogy (Zuhdi et al., 2021) or the concept of Student Agency in Digital Learning (Blaschke & Hase, 2019), which highlight the importance of empowering students within the digital learning ecosystem. Furthermore, the use of the SAMR model

(Substitution, Augmentation, Modification, Redefinition) as the basis for analyzing the level of technology integration in learning is closely related to international studies, as highlighted by Hamilton et al., (2016), these studies emphasize how technology is not just a tool but also a medium for developing students' critical, collaborative, and creative thinking skills dimensions that, in this study, only begin to emerge through the use of simple applications and discussion activities after watching videos.

Additionally, the positive impact of digital-based learning on students' development such as the creation of a more engaging learning environment, improved digital media skills, and increased student activity shows alignment with international findings on engagement and self-directed learning in the digital context (Brame, 2018). However, this study has not explicitly connected these results with digital student engagement theories such as those developed by Fredricks et al., (2004) or constructivist digital learning approaches that emphasize personalization and active student participation in learning (Kirkwood & Price, 2014).

Thus, although this study makes a valuable contribution in the local context, especially in depicting the dynamics of digital-based Islamic Education implementation in Central Sulawesi, there is a need for expanding the dialogue with international literature. This is important for strengthening the conceptual foundation and providing a more comprehensive understanding of digital pedagogy practices in Islamic education, with a focus on developing student quality in the global era.

4. CONCLUSION

This study investigates the implementation of digital-based Islamic Education (PAI) in secondary schools in Central Sulawesi, identifying key factors that contribute to its success. School principals play a pivotal role as leaders, facilitators, and policymakers, supporting and overseeing the integration of technology in teaching. The development of learning concepts aligned with students' interests, particularly through the Technological Pedagogical Content Knowledge (TPACK) framework, significantly enhances the effectiveness of digital learning. Despite challenges such as limited infrastructure, poor internet access, and low digital literacy among educators, schools in Palu City, including SMAN 4 Palu, SMAN 7 Palu, and SMKN 3 Sigi, successfully utilized accessible digital tools like ActivePresenter, Canva, YouTube, and Google Drive to create engaging learning environments that promote critical thinking, creativity, and digital literacy. The study also emphasizes the need for continuous teacher professional development and the adaptation of learning concepts to local contexts.

However, while these efforts have led to positive outcomes in student engagement and learning quality, the study's theoretical framework is primarily local, with limited reference to international pedagogical models. This highlights an opportunity to integrate global perspectives into the design and evaluation of digital-based Islamic Education.

Several strategies are recommended to build upon these findings. First, improving technological infrastructure, especially in rural and underserved areas, is crucial for ensuring uninterrupted digital learning, including reliable internet access, modern devices, and robust e-learning platforms. Second, schools should invest in continuous professional development for teachers to enhance their digital literacy and pedagogical skills, ensuring effective integration of technology in teaching. Additionally, fostering student-centered learning designs that emphasize critical thinking, collaboration, and creativity is essential for engaging students in the digital age. Lastly, schools should collaborate with technology providers, universities, and external stakeholders to share resources and expertise in advancing digital education.

Future research should expand on this study by incorporating broader theoretical frameworks such as Digital Islamic Pedagogy and Student Agency in Digital Learning to provide a more comprehensive understanding of digital pedagogy in Islamic Education. Comparative studies across regions and countries could offer valuable insights into global trends in digital education. A deeper exploration of student engagement—considering its behavioral, emotional, and cognitive

dimensions—will enrich our understanding of how technology impacts learning outcomes. Longitudinal and mixed-methods studies would provide deeper insights into the long-term effects of digital Islamic Education on student achievement and institutional transformation. Finally, exploring emerging technologies such as artificial intelligence and virtual reality could offer innovative pathways for future pedagogical advancements.

This comprehensive research approach will contribute to the development of Islamic Education and integrate it into the broader global discourse on digital pedagogy, offering a more holistic framework for the future of education in the digital age.

REFERENCES

Al-Rahmi, A. M., Shamsuddin, A., Alturki, U., Aldraiweesh, A., Yusof, F. M., Al-Rahmi, W. M., & Aljeraiwi, A. A. (2021). The influence of information system success and technology acceptance model on social media factors in education. *Sustainability*, *13*(14), 7770.

Assa'idi, S. (2021). Religious Education Curriculum in Indonesian Islamic University in the Digital Age: Incepting Thematic Alquran of Fadlur Rahman. *Journal of Social Studies Education Research*, *12*(3), 294–311.

Baharun, H., & Ummah, R. (2018). Strengthening Students' Character in" Akhlaq" Subject through Problem Based Learning Model. *Online Submission*, *3*(1), 21–30.

Balontia, M. J., & Iskandar, I. F. R. (2022). Digital Technology Used in Character Building Education to Anticipate Radicalism: BINUS University's Contribution to Strengthen Indonesia's Defense. *Proceedings of the 2022 5th International Conference on Education Technology Management*, 176–181.

Blaschke, L. M., & Hase, S. (2019). Heutagogy and digital media networks. *Pacific Journal of Technology Enhanced Learning*, *1*(1), 1–14.

Boulton, J. G., Allen, P. M., & Bowman, C. (2015). *Embracing complexity: Strategic perspectives for an age of turbulence*. Oxford University Press.

Brame, C. (2018). Active learning. Vanderbilt University Center for Teaching (2016). *Saatavissa (Luettu 4.5. 2019): Https://Cft. Vanderbilt. Edu/Guides-Sub-Pages/Active-Learning*.

Caswell, T., Henson, S., Jensen, M., & Wiley, D. (2008). Open educational resources: Enabling universal education. *International Review of Research in Open and Distributed Learning*, *9*(1), 1–11.

Crompton, H., & Burke, D. (2020). Mobile learning and pedagogical opportunities: A configurative systematic review of PreK-12 research using the SAMR framework. *Computers & Education*, *156*, 103945.

Djazilan, M. S., & Hariani, M. (2022). Implementation of E-Learning-Based Islamic Religious Education. *Bulletin of Science, Technology and Society*, *1*(2), 14–21.

Fahmi, A. N., Yusuf, M., & Muchtarom, M. (2021). Integration of Technology in Learning Activities: E-Module on Islamic Religious Education Learning for Vocational High School Students. *Journal of Education Technology*, *5*(2), 282–290.

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies*, *10*(4), 86.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, *74*(1), 59–109.

Hamilton, E. R., Rosenberg, J. M., & Akcaoglu, M. (2016). The substitution augmentation modification redefinition (SAMR) model: A critical review and suggestions for its use. *TechTrends*, *60*, 433–441.

Hasanah, U., Hadi, F. N., & Fajriansyah, I. (2021). Digital-Based Learning During the Covid-19 Pandemic at Indonesian Islamic State University. *Khalifa: Journal of Islamic Education*, *5*(2), 222–239.

Hidayat, A., Fatimah, S., & Rosidin, D. N. (2021). Challenges and Prospects of Islamic Education Institutions and Sustainability in The Digital Era. *Nazhruna: Jurnal Pendidikan Islam*, *5*(2), 351–366.

Hilman, C. (2025). Digital-Based Islamic Religious Education: A New Orientation in Enhancing Student Engagement and Spiritual Understanding. *The Journal of Academic Science*, *2*(1), 53–65.

Ismiyati, I., Pramusinto, H., Sholikah, M., & Yulianti, N. D. (2022). Meta-analysis of digital-based learning to improve learning outcomes. *Psychology, Evaluation, and Technology in Educational Research*, *4*(2), 53–62.

Jayanegara, A., Nara, D., Kheriawan, K., & Marhamah, M. (2024). Elevating Motivation and Engagement of Students In Islamic Education: A Meta-Analysis on The Use of Interactive Learning Approaches. *Journal of Multidisciplinary Islamic Studies EISSN 2785-9223*, *4*(1), 6–10.

Kharismatunisa, I. (2023). Innovation and Creativity of Islamic Religious Education Teachers in Utilizing Digital-Based Learning Media. *Scaffolding: Jurnal Pendidikan Islam Dan Multikulturalisme*, *5*(3), 519–538.

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is 'enhanced'and how do we know? A critical literature review. *Learning, Media and Technology*, *39*(1), 6–36.

Lubis, S. H. (2018). Islamic religious education (PAI) learning management in the formation of student characters at state senior high school I of Panyabungan. *International Journal on Language, Research and Education Studies*, *2*(3), 369–380.

Muis, A., Eriyanto, E., & Readi, A. (2022). Role of the Islamic Education teacher in the Moral Improvement of Learners. *Jurnal At-Tarbiyat: Jurnal Pendidikan Islam*, *5*(3).

Nami, F., & Vaezi, S. (2018). How ready are our students for technology-enhanced learning? Students at a university of technology respond. *Journal of Computing in Higher Education*, *30*(3), 510–529.

Nasaruddin, A. H., & Ladiqi, S. (2023). Digital-Based Islamic Religious Education (IRE) Learning Model at Senior High School. *Indonesian Journal of Islamic Education Studies (IJIES)*, *6*(1), 79–92.

Nofitri, T. W., & Octoria, D. (2024). The Effect of Problem-Based Learning and Discovery Learning Models on Student Learning Outcomes Based on Teacher's TPACK. *Economic Education Analysis Journal*, *13*(3), 231–244.

Nurqozin, M., & Putra, D. (2023). Digital media-based learning in improving the quality of Islamic religious education learning at the integrated Islamic vocational high school of Tebuireng III Indragiri Hilir Riau. *Eximia*, *12*, 446–455.

Ossiannilsson, E., Altinay, Z., & Altinay, F. (2016). Transformation of teaching and learning in higher education towards open learning arenas: A question of quality. *Open Education: International Perspectives in Higher Education*, 159–178.

Owen, P. S., & Demb, A. (2004). Change dynamics and leadership in technology implementation. *The Journal of Higher Education*, *75*(6), 636–666.

Pane, N., Mahfi, I. A., Khairi, A., & Ma'arif, M. G. (2023). The Use of Internet-Based Digital PAI Learning Resources, Websites and Social Media at Al Azhar Excellent High School Medan. *Journal of Multidisciplinary Science*, *2*(6), 297–303.

Pohan, S. A., & Dafit, F. (2021). Pelaksanaan pembelajaran kurikulum 2013 di sekolah dasar. *Jurnal Basicedu*, *5*(3), 1191–1197.

Preszler, R. W., Dawe, A., Shuster, C. B., & Shuster, M. (2007). Assessment of the effects of student response systems on student learning and attitudes over a broad range of biology courses. *CBE—Life Sciences Education*, *6*(1), 29–41.

Rosyidah, S., & Juharyanto, J. (2024). The Influence of the TPACK Approach (Technological Pedagogical Content Knowledge) in Curriculum Management and Learning based Kurikulum Merdeka. *Proceedings Series of Educational Studies*, 450–457.

Ruswandi, A., Firdaus, M. A., & Ruswandi, R. (2023). Readiness of Islamic Religious Education Teachers for Digital Learning Post Pandemic Covid 19. *International Journal of Ethno-Sciences and Education Research*, *3*(3), 77–84.

Salsabila, M., & Mavianti, M. (2022). Digital-Based Islamic Religious Education Learning in Enhancing Cognitive Development on Children. *Journal on Teacher Education*, *4*(2), 1343–1350.

Saraya, A., Mardhatillah, A., Fitriani, E. N., & Adiyono, A. (2023). The Role Of Islamic Religious Education Teachers: Problems In Evaluating Student Learning Outcomes In Junior High Schools.

Dharmas Education Journal (DE_Journal), *4*(2), 565–572.

Savignano, M. A. (2017). *Educators' Percpetions of the Substitution, Augmentation, Modification, Redefinition Model for Technology Integration*. University of Northern Colorado.

Srikan, P., Pimdee, P., Leekitchwatana, P., & Narabin, A. (2021). A Problem-Based Learning (PBL) and Teaching Model using a Cloud-Based Constructivist Learning Environment to Enhance Thai Undergraduate Creative Thinking and Digital Media Skills. *Int. J. Interact. Mob. Technol.*, *15*(22), 68.

Terrion, J. L., & Aceti, V. (2012). Perceptions of the effects of clicker technology on student learning and engagement: a study of freshmen Chemistry students. *Research in Learning Technology*, *20*.

Utama, M. M. A. (2022). PAI Learning Media in The Perspective of Abdullah Nashih Ulwan in The Society Era 5.0. *Southeast Asian Journal of Islamic Education*, *4*(2), 249–259.

Yumnah, S. (2021). E-learning based islamic religious education of learning media: alternative solutions for online learning during covid-19. *Nazhruna: Jurnal Pendidikan Islam*, *4*(2), 249–260.

Zuhdi, M. N., Setiawan, I., Nawawi, M. A., Zubad, M., Iwanudin, I., & Asnawi, H. S. (2021). The Students'views on the Indonesia's Non-Muslim Leader's Phenomenon in Aisyiyah University Yogyakarta. *Akademika: Jurnal Pemikiran Islam*, *26*(1), 137–152.