Edukasi Islami: Jurnal Pendidikan Islam, VOL: 14/No: 04 November 2025 **P-ISSN: 2252-8970**
DOI: 10.30868/ei.v14i04.9173 **E-ISSN: 2581-1754**

Date Received	**:**	**September 2025**
Date Revised	**:**	**October 2025**
Date Accepted	**:**	**November 2025**
Date Published	**:**	**November 2025**

TRANSFORMATION OF ISLAMIC EDUCATION IN MUHAMMADIYAH ELEMENTARY SCHOOLS IN THE DIGITAL ERA

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Kata Kunci:
Transformasi Digital; Sekolah Islam; Infrastruktur Teknologi.

ABSTRAK

Latar Belakang: Penelitian ini mengkaji transformasi pendidikan di SD Muhammadiyah Pacul sebagai respons terhadap tuntutan era digital. Fokus penelitian ini adalah bagaimana sekolah mengimplementasikan teknologi digital dalam proses belajar mengajar serta dampaknya terhadap kualitas pendidikan Islam. **Tujuan:** Tujuannya adalah mengevaluasi efektivitas integrasi teknologi dan memberikan rekomendasi penguatan kapasitas kelembagaan. **Metode:** Dengan pendekatan studi kasus melalui wawancara, observasi, dan analisis dokumen, hasil penelitian menunjukkan bahwa penerapan teknologi digital meningkatkan interaktivitas dan keterlibatan siswa dalam pembelajaran. Namun, tantangan masih muncul terkait pelatihan guru dan keterbatasan infrastruktur. **Hasil:** Temuan ini memiliki implikasi luas bagi praktik pendidikan Islam di Indonesia, yakni pentingnya membangun ekosistem digital yang tidak hanya berorientasi pada teknis, tetapi juga menanamkan nilai-nilai Islam melalui inovasi pembelajaran. **Kesimpulan:** Reformasi digital di sekolah Islam perlu diarahkan pada kebijakan peningkatan literasi digital religius, penguatan pelatihan guru berbasis nilai-nilai Islam, serta penyediaan infrastruktur yang merata agar transformasi digital menjadi instrumen dakwah dan peningkatan mutu pendidikan Islam di era modern.

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Keywords:
Digital Transformation; Islamic Schools; Technological Infrastructure.

ABSTRACTS

Background: This study examines the educational transformation at SD Muhammadiyah Pacul in response to the demands of the digital era. The main focus is to explore how the school implements digital technology in teaching and learning processes and how this affects the quality of Islamic education. **Purpose:** The study aims to evaluate the effectiveness of technology integration and provide recommendations for strengthening institutional capacity. **Method:** Using a case study approach through interviews, observations, and document analysis, the findings reveal that digital technology enhances student interactivity and engagement in learning. However, challenges remain in terms of teacher training and technological infrastructure. **Result:** These findings have broader implications for Islamic education practices in Indonesia, emphasizing the importance of building a digital ecosystem that not only focuses on technical proficiency but also embeds Islamic values through innovative learning. Digital reform in Islamic schools should be directed toward policies that promote religious digital literacy, strengthen teacher training based on Islamic principles, and ensure equitable technological infrastructure. **Conclusion:** In this way, digital transformation becomes both an instrument of da'wah and a means of improving the quality of Islamic education in the modern era.

A. INTRODUCTION

The digital era has brought major changes in many aspects of human life, including education. With advances in information and communication technology (ICT), various digital tools have been incorporated into the learning process. This promises a more interactive and engaging learning method as well as improving the quality of education. (Lal 2021) conducted research showing that the use of technology in the school curriculum can improve students' cognitive and technical skills. The use of technology in education in Indonesia still needs to be solved. These include limited infrastructure, a lack of teacher instruction, and the absence of relevant and quality digital content. According to (Yohanandhan 2022) study, many teachers in Indonesia still need to be fully ready to implement learning technology due to limited training and support. In today's rapidly developing digital era, the importance of educational reform is unpredictable. As technology continues to shape and redefine the way we live and work, educational institutions must adapt to these changes to prepare students for the future (Okoye 2023). The integration of technology in the classroom not only enhances the learning experience but also equips students with the skills necessary to thrive in a technology-driven society. In this way, schools can ensure that students are well-equipped to succeed in an increasingly digital world (Rizvi 2021). Moving forward, educators must continue to integrate technology and innovation into the curriculum to prepare students for the ever-changing demands of the modern world. By providing opportunities for practical learning and real-world applications, students can develop critical thinking skills and problem-solving abilities that will serve them well in the digital age. This shift towards a more dynamic and interactive approach to education not only benefits individual students but also contributes to the progress of society as a whole (Shahriar 2021).

In the last ten years, the adoption of digital technology has changed the world of education. Schools in Indonesia, including SD Muhammadiyah Pacul, are caught in the middle between long-standing educational traditions and the urgent need to

incorporate digital technology into the curriculum and teaching methods. This integration is necessary because of technological advances as well as changes in the needs of society and the world of work, which require students to have strong digital skills. The ability to adapt to digital technology is very important for students' future success, according to research conducted by Tungpantong 2021. (Dai 2021) revealed that schools that effectively use digital technology can improve student academic achievement. Given rapid social and economic changes and the demands of 21st-century competencies, incorporating digital technology in basic education is becoming increasingly important in Indonesia. Most of these studies focus on secondary and higher education, while research on the specific impact of digital transformation in Islamic primary education, particularly in Indonesia, remains limited.

In recent years, SD Muhammadiyah Pacul has experienced an extraordinary transformation, developing from a traditional school with outdated teaching methods to a modern educational institution that embraces innovation and technology. This transformation has been driven by a commitment to provide students with a high-quality education that prepares them for success in the 21st century (Nazarov 2021). One of the key changes that has occurred at SD Muhammadiyah Pacul is the integration of technology into the curriculum. Students now have access to computers, tablets, and other digital tools that enhance their learning experience. Teachers have also received training on how to integrate technology into their lessons, making the classroom environment more interactive and engaging. This shift towards a more technology-savvy approach has not only improved academic performance but has also prepared students for the digital world they will face in their future careers. Overall, the transformation of SD Muhammadiyah Pacul has been a great success, with students and teachers alike embracing the change and thriving in this new educational environment.

As part of a large and historic education system in Indonesia, Muhammadiyah Schools face many challenges and opportunities in this digital era. They focus on providing high-quality education and are rooted in Islamic values. To ensure that these institutions remain relevant and effective in delivering education, the transition to digital technology is essential. Referring to research Mabrur 2021, Muhammadiyah schools that have started digital transformation show increased student motivation and involvement in the learning process. However, digital education includes more than just the use of digital tools; Learning paradigms and approaches also need to be changed. According to Benlizidia 2023, teachers must be equipped with adequate skills and knowledge to integrate technology into learning effectively (Tarasova 2023). In the context of SD Muhammadiyah Pacul, this means that investment in teacher training is a critical aspect that cannot be ignored. Infrastructure is also critical to the success of digital technology. According to Wilson 2023, many schools in agricultural areas face problems in terms of accessibility and availability of adequate ICT infrastructure.

Several previous studies have examined digital transformation at secondary or tertiary level Islamic educational institutions, but only a few have specifically highlighted transformation at the primary education level. Previous studies have shown that digital transformation boosts student motivation and engagement in Islamic schools, but they do not clearly explain how this transformation shapes adaptive, collaborative, and values-based learning at the elementary level. This research can fill this gap by exploring how a Muhammadiyah elementary school carries out Islamic education reforms in facing the digital era. In the context of Muhammadiyah Education,

this research is unique because it focuses on educational institutions under the auspices of the Muhammadiyah organization, which has certain organizational characteristics and culture(Saputra 2021). This can provide a new perspective on how digital transformation is carried out by Islamic educational institutions such as Muhammadiyah. This research can provide a more detailed and comprehensive picture of the digital transformation process, the problems faced, the strategies used, and the results by using an in-depth case study approach at SD Muhammadiyah Pacul. This has the potential to increase understanding of the dynamics of the transformation of Islamic education in the digital era in a more contextual way. It can assist in developing Islamic education policies and practices in the digital era, both at the educational institution level and on a wider scale. This can help other Islamic education in designing and implementing digital transformation. Therefore, this research aims to identify special infrastructure needs that support digital learning at SD Muhammadiyah Pacul.

B. METHOD

The method in this research is a qualitative approach that utilizes Nvivo software to analyze data in depth and systematically. This research aims to see how the Edumu application, as part of the Muhammadiyah national program, utilizes Chromebooks for learning, as well as the integration of the Merdeka Mengajar Platform (PMM), Google Form, and Eksambo applications in the educational process. The data was collected through in-depth interviews with teachers, students, and program managers and participatory observation during learning sessions. Data from interview transcripts, field notes, and supporting documents were then imported into Nvivo for organization and analysis (Khan 2022). By using Nvivo features, such as coding, theme development, and querying, researchers can identify essential patterns and central themes that describe the effectiveness and challenges of using this technology (Hurst 2021). This analysis enables a more comprehensive understanding of how technologies such as Chromebooks and other digital learning platforms are used in the Muhammadiyah educational context and how they contribute to improving the quality of learning. The analysis process followed several key stages, (1) Data Transcription and Organization: All interview transcripts, observation notes, and supporting documents were transcribed verbatim and imported into NVivo for organization into initial nodes and categories. (2) Initial Coding: Open coding was conducted to identify recurring concepts and patterns from the raw data. Initial categories such as “digital literacy,” “teacher training,” and “parental involvement” emerged during this phase. (3) Theme Development: The initial codes were grouped into higher-order themes representing the core aspects of digital transformation, such as *Technology-Based Curriculum*, *Adaptive Learning*, and *Teacher Professional Development*. (4) Thematic Analysis and Visualization: NVivo’s *query* and *modeling* features were used to examine relationships among themes and visualize them through *node maps* and *word clouds*, illustrating interconnections between key concepts. (5) Validation and Triangulation: The analysis was validated through *member checking* with selected participants and triangulation across data sources to ensure the credibility and reliability of findings.

This analytical process not only produced a conceptual map of the digital transformation in Islamic education but also offered a nuanced understanding of how technology integration shapes pedagogical practices and institutional culture in Islamic

primary schools. The use of NVivo facilitated a rigorous, transparent, and context-sensitive analysis aligned with the goals of this research.

C. RESULT AND DISCUSSION

1. Research Node

In this research, important points were found which were used as nodes that support the transformation of Islamic education in the digital era in Muhammadiyah elementary schools as in table 1.

Table 1. Research Nodes

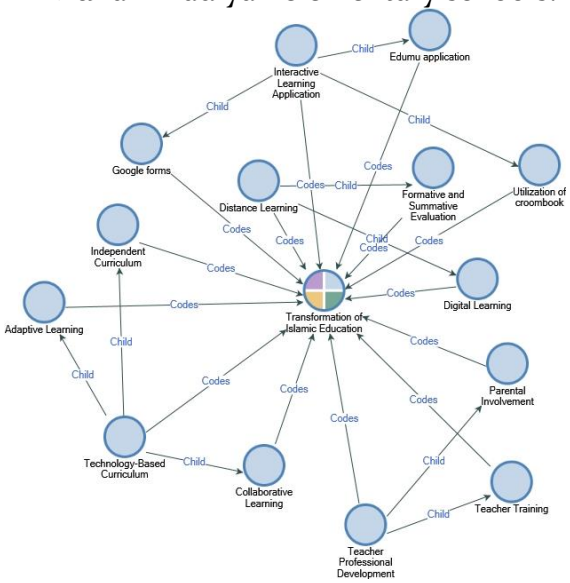
Parent Node	Child Node
Technology-Based Curriculum	Adaptive Learning
	Collaborative Learning
	Independent Curriculum
Distance Learning	Digital Learning
	Formative and Summative Evaluation
Digital Literacy	
Interactive Learning Application	Utilization of croombook
	Google forms
	Edumu application
Teacher Professional Development	Parental Involvement
	Technical Support
	Teacher Training

In this research, key points were identified as nodes supporting the transformation of Islamic education in the digital era in Muhammadiyah elementary schools. The Technology-Based Curriculum includes Adaptive Learning, Collaborative Learning, and an Independent Curriculum, promoting personalized, cooperative, and self-directed education. Distance Learning involves Digital Learning and Formative and Summative Evaluation, ensuring continuous and comprehensive assessment (Timmis 2016). Emphasizing Digital Literacy prepares students to navigate digital tools effectively. Interactive Learning Applications enhance the educational experience using Chromebooks, Google Forms, and the Edumu application. Finally, Teacher Professional Development includes Parental Involvement, Technical Support, and Teacher Training, ensuring a supportive learning environment and equipping educators with necessary skills (Shute 2017). The primary challenge lies in their pedagogical and technical capacity to operate digital tools and design interactive, technology-based lessons that align with Islamic educational values. These nodes collectively drive the transformation towards a more adaptive, collaborative, and technologically integrated educational framework in Muhammadiyah elementary schools.

2. Education Transformation of Islamic Education interview distribution map

The image below depicts these nodes, grouped into several main categories. Technology-based curriculum includes Adaptive Learning, Collaborative Learning, and Self-Directed Curriculum, all of which aim to promote more personalized, cooperative, and independent education. Distance Learning involves Digital Learning and Formative

and Summative Evaluation, which ensures continuous and comprehensive assessment. Digital Literacy is essential to prepare students to use digital tools effectively. Interactive Learning Apps enhance the learning experience using Chromebooks, Google Forms, and the Edumu app. Lastly, Teacher Professional Development involves Parent Involvement, Technical Support, and Teacher Training (Mimirinis 2019), ensuring a supportive learning environment and necessary skills for educators. These nodes drive the transformation towards a more adaptive, collaborative and technology-integrated educational framework in Muhammadiyah elementary schools.



Fg.1
(a) Interview Distribution Map
Source : Nvivo Data Processing Results 2024

Figure 1 shows how the transformation of Islamic education in the digital era in Muhammadiyah elementary schools is built through several interrelated vital nodes. The Technology-Based Curriculum is the main foundation, focusing on Adaptive Learning, Collaborative Learning, and Independent Curriculum, enabling education tailored to individual student needs, promoting cooperation, and providing freedom to learn according to interests. Distance Learning supports this process by adopting Digital Learning and Formative and Summative Evaluation (Torío 2019), which provides ongoing assessment of student progress. Developing Digital Literacy is essential, ensuring students have the skills to use technology wisely and effectively.

Furthermore, Interactive Learning Applications such as Chromebooks, Google Forms, and the Edumu application increase student interaction and involvement in learning. This facilitates easy access to educational resources and allows for more efficient evaluation. Teacher Professional Development also plays a critical role in this transformation through Parental Involvement that ensures support at home, Tech Support that overcomes technology barriers, and Teacher Training that equips educators with new skills (Carney 2018). From the students' point of view, tools such as *Chromebooks* and *Google Forms* have increased motivation and active participation. Nonetheless, some students faced issues related to internet instability and limited basic digital literacy. Teachers addressed these constraints by adopting *blended learning* methods—combining online and face-to-face instruction—to maintain learning continuity despite technical barriers. Parents held mixed views regarding digital

transformation. While some appreciated its potential for monitoring their children's learning, others were concerned about distractions and exposure to non-educational online content. In response, the school implemented digital literacy programs for parents, emphasizing responsible device use grounded in Islamic ethical principles, thereby strengthening collaboration between the school and families.

These findings suggest that digital transformation in Islamic education involves not only technical adaptation but also cultural, pedagogical, and social shifts. Teachers serve not merely as technology users but as facilitators of Islamic values in digital spaces. Meanwhile, active student participation and parental engagement constitute critical elements of sustainability. Hence, the success of SD Muhammadiyah Pacul's digital transformation reflects the synergy between technological innovation and the preservation of Islamic spiritual and moral values.

3. Word Cloud interview

The image below represents keywords that frequently appear in the context of digital learning, technology-based curriculum, and teacher professional development.

Fg.2
(b) Word Cloud interview
Source : Nvivo Data Processing Results 2024

Analysis of the word cloud above reveals the main keywords supporting Islamic education's transformation in the digital era in Muhammadiyah elementary schools. The dominance of "learning" emphasizes the main focus on the learning process, which is the core of education. Other essential terms such as "students" and "teachers" indicate the central role of students and teachers in the educational ecosystem (Ada 2017). "technology" and "digital" reflects the importance of integrating technology into modern teaching methods. In addition, "technical" indicates the need for adequate technical support to support digital learning.

The use of specific applications such as "Google Forms" and "Edumu" shows how these digital tools support assignments and evaluations, making the learning process more efficient and measurable. Terms such as "questions," "answers," "assignments,"

and "evaluations" highlight the interactive and evaluative aspects of the learning process, where students are actively engaged in ongoing academic and assessment activities (Sjödén 2011).

Parental involvement can also be seen in the word "parental involvement," which shows the importance of family support in distance learning. The words "training" and "support" emphasize the need for continuous training for teachers to master new technologies and adequate technical support to overcome the challenges.

4. Word Frequency Query Results

Below is a table detailing the results of a word frequency analysis, showing the key elements that contributed to this transformation. This table covers various aspects such as technology-based curriculum, distance learning, digital literacy, interactive learning applications, and teacher professional development (Rohr 2022). This data provides in-depth insight into how these components work together to support more effective and technology-integrated Islamic education in the digital era.

Table 2. 3.4. Word Frequency

Word	Length	Count
technology	10	23
elementary	10	16
assignments	11	14
curriculum	10	14
collaborative	13	11
independent	11	11
supporting	10	11
challenges	10	10
involvement	11	10
application	11	9
evaluation	10	9
activities	10	8
chromebook	10	7
chromebooks	11	7
educational	11	7
evaluations	11	7
applications	12	6
collaboration	13	6
discussions	11	6
participate	11	6

Table 2 shows various vital elements contributing to the transformation of Islamic education in the digital era in Muhammadiyah elementary schools. The word "technology" is used most frequently, emphasizing the importance of integrating technology in the educational process (Sacchanand 2006), which is at the heart of this transformation. The use of technology enables the implementation of adaptive and collaborative learning and supports a technology-based curriculum that is flexible and appropriate to student needs.

The word "elementary" indicates a focus on the basic education level, where the foundations of digital learning and technological literacy are built. This reflects an effort to prepare students from an early age with relevant skills for the digital era. The terms "assignments" and "curriculum" indicate that assignments and curriculum play an essential role in this educational structure, emphasizing a more interactive and structured approach to supporting student learning (Sørensen 2015). The word "collaborative" highlights the importance of collaborative learning, where students are encouraged to work together on group projects and assignments, utilizing digital tools to communicate and share information.

Overall, this data illustrates how various elements such as technology, curriculum, assignments, and collaborative learning contribute synergistically to support the transformation of Islamic education in Muhammadiyah elementary schools in the digital era (Burvill 2022). Integrating technology in all aspects of education aims to create a more adaptive, interactive and collaborative learning environment, which aligns with the needs and challenges of the modern era.

CONCLUSION

This transformation has succeeded in creating a learning environment that is more adaptive, interactive and integrated with technology. This school has promoted more personalized, cooperative and independent education by implementing a Technology-Based Curriculum, which includes Adaptive Learning, Collaborative Learning and Independent Curriculum. Distance Learning involving Digital Learning and Formative and Summative Evaluation ensures continuous and comprehensive assessment of student progress. The development of robust Digital Literacy prepares students to use digital tools effectively while using Interactive Learning Applications such as Chromebooks, Google Forms, and the Edumu application increases student interaction and engagement in the learning process. Teacher Professional Development through Parent Involvement, Technical Support, and Teacher Training ensures a supportive learning environment and the necessary skills for educators to utilize new technology in their teaching.

In the long term, this digital transformation holds significant potential for sustaining the reform of Islamic education. Digitalization is not merely a technical innovation but a comprehensive institutional reform strategy that enables Islamic education to adapt to technological and societal changes while preserving its spiritual essence. The mastery of digital tools by teachers and students within Islamic schools broadens access to global learning resources, strengthens 21st-century competencies, and ensures that Islamic moral values remain central to educational innovation.

Furthermore, the findings and recommendations of this study can be applied more broadly across other Islamic educational institutions in Indonesia. Islamic schools may adopt the integration model developed at SD Muhammadiyah Pacul as a framework for establishing balanced digital learning ecosystems that combine technological advancement with spiritual integrity. Institutional support, continuous teacher development, and inter-school collaboration are key factors in reinforcing a sustainable reform movement within Islamic education in the digital era.

Thus, this study reaffirms that digital transformation serves as a strategic pathway for renewing the vision of Islamic education making it technologically adaptive

while remaining deeply rooted in the values of *tawhid*, morality, and universal humanity.

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