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Digital Transformation of School Academic Management: A Case Study of an Indonesian Islamic Secondary School

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Abstract: This study aims to describe the implementation of academic digitalization in the learning process at MA Negeri 2 Pati, with a focus on lesson planning, instructional delivery, and learning evaluation. A qualitative phenomenological approach was employed, involving fifteen purposively selected participants, including teachers and students. Data were collected through in-depth interviews, classroom observations, and document analysis. Data analysis followed an interactive approach consisting of data reduction, data display, and conclusion drawing, while data validity was ensured through source and method triangulation. The findings indicate that academic digitalization at MA Negeri 2 Pati has been implemented in a systematic and integrated manner. Digital tools are utilized in lesson planning, the deployment of digital learning platforms, interactive learning media, and digital-based assessment systems. This implementation positively contributes to learning effectiveness, assessment transparency, and the enhancement of academic service quality. The study highlights that the success of academic digitalization strongly depends on human resource readiness and sustained institutional support, including teacher professional development programs, adequate digital infrastructure, and policies that promote the integration of technology in learning activities.

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Introduction

Academic digitalization has become a strategic agenda in the transformation of education in the era of rapid information and communication technology development (Kementerian Pendidikan dan Kebudayaan, 2019). The use of digital technology in learning is no longer viewed as an additional innovation, but as a fundamental necessity to support educational practices that are relevant to 21st-century demands (UNESCO, 2020). Digital learning is expected to foster more interactive, collaborative, flexible, and student-centered learning environments through the use of digital media, online learning platforms, and technology-based assessment systems (Nelga et al., 2022).

However, the implementation of academic digitalization in educational institutions has not yet been fully optimized (Rusnati, 2021). In practice, many schools and madrasahs still interpret digitalization merely as the use of technological devices or learning applications, without being accompanied by substantial changes in pedagogical approaches. As a result, the utilization of technology has not entirely contributed to improving the quality of learning processes, student engagement, or learning outcomes (A. D. Putra et al., 2025).

The advancement of educational technologies such as Learning Management Systems (LMS), interactive learning media, and the application of artificial intelligence (AI) requires a paradigm shift from teacher-centered to student-centered learning (Muvid, 2024). This shift

positions students as active participants in the learning process, while teachers act as facilitators and instructional designers. Therefore, academic digitalization demands not only adequate infrastructure but also the readiness of human resources, particularly teachers, to manage technology-based learning pedagogically and sustainably (Nelga et al., 2022).

Recent studies indicate that academic digitalization has significant potential to enhance learning quality when implemented in a well-planned and integrated manner. (Komariah & Rosdiana, 2023) argue that academic digitalization improves learning effectiveness through digital and real-time management of learning materials, assessments, and academic interactions. Digital systems also enable teachers to systematically and accurately monitor students' learning progress.

(Hamid, 2022) emphasizes that digital-based learning offers flexibility, increases student participation, and encourages the use of diverse instructional strategies. Digital platforms allow multimodal content delivery that accommodates students' varied learning styles. These findings are supported by (Sutarsih et al., 2024), who report that digital learning contributes to improved student engagement and instructional effectiveness when supported by appropriate learning design. Moreover, (Kementerian Pendidikan dan Kebudayaan, 2019) highlights the central role of teachers, emphasizing that educators are required not only to master technology but also to possess digital pedagogical competence in designing meaningful, contextual, and critical-thinking-oriented learning. Further identify disparities in teachers' digital literacy as a dominant factor affecting the optimization of academic digitalization in schools (Adila & Rodiyah, 2024).

(Inayah et al., 2021) demonstrate that the success of digital learning largely depends on the integration of learning platforms with school academic systems. Fragmented digitalization may increase teachers' workload and reduce instructional effectiveness. This indicates that academic digitalization should be understood as a comprehensive learning system rather than the partial use of isolated applications. Several studies also highlight implementation challenges, including students' varying levels of readiness, difficulties in adapting to self-directed learning, and limited guidance in technology use (J. E. Putra et al., 2024). These findings suggest that academic digitalization requires a mature pedagogical approach to ensure that technology genuinely enhances learning quality.

Despite the growing body of research on digital learning, most studies focus on policy aspects, infrastructure readiness, or the general effectiveness of digital platforms (Setiyono et al., 2025). Research that specifically examines the comprehensive implementation of academic digitalization across lesson planning, classroom learning practices, and learning assessment remains limited, particularly within the context of madrasahs. Madrasahs possess distinctive characteristics compared to general schools, particularly in the integration of religious and general subjects, the incorporation of Islamic values in the learning process, and the organizational structure under the Ministry of Religious Affairs. These characteristics influence how digital technologies are integrated into academic management and learning practices. Empirical studies that portray real practices of academic digitalization in public madrasahs are also scarce. This gap is significant, considering that madrasahs possess distinctive characteristics in curriculum structure, organizational culture, and the integration of Islamic values into learning. These limitations indicate a gap between theoretical discussions on digital learning and its practical implementation at the institutional level, especially in madrasah settings.

Based on this research gap, this study aims to describe the implementation of academic digitalization in the learning process at MA Negeri 2 Pati, focusing on lesson

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planning, instructional implementation, and the evaluation of student learning outcomes. MA Negeri 2 Pati was selected as the research site because the institution has actively implemented academic digitalization in its learning management system, including digital lesson planning, online learning platforms, and digital-based assessment systems. This condition provides a relevant context for examining the practical implementation of academic digitalization in a madrasah environment. The novelty of this study lies in its comprehensive examination of academic digitalization practices within a public madrasah context, providing empirical insights into how digital learning is implemented in a practical and sustainable manner. This study is expected to enrich the literature on academic digitalization and serve as a practical reference for madrasahs and schools in optimizing the pedagogical use of technology.

Research Method

This study employed a qualitative research approach with a phenomenological design. The phenomenological approach was used to gain an in-depth understanding of the experiences, perceptions, and meanings constructed by informants regarding the implementation of the academic digitalization program at the school. Through this approach, the researcher sought to explore participants' lived experiences as they were directly experienced, while bracketing prior assumptions so that the meanings emerged authentically from the informants' perspectives (Hadi et al., 2021).

The research subjects consisted of 74 teachers at MA Negeri 2 Pati. From this population, purposive sampling was applied to select informants who were considered to have direct involvement and sufficient understanding of the implementation of the academic digitalization program. The research informants included teachers and students, with a total of fifteen informants. This selection was intended to obtain comprehensive and balanced data related to the planning, implementation, and evaluation of the academic digitalization program. Data were collected through in-depth interviews, observation, and documentation. In-depth interviews were conducted to explore informants' views, experiences, and roles in utilizing academic digitalization. Observations focused on academic activities involving the use of digital systems in the learning process, while documentation included learning instruments, records of academic digital system usage, and school policy documents related to digitalization.

Data analysis was carried out interactively through the stages of data reduction, data display, and conclusion drawing. This interactive model of qualitative data analysis allows researchers to continuously interpret and verify data during the research process (Matthew & Michael, 2016). The collected data were selected, categorized, and systematically organized into narrative forms to identify patterns, relationships, and emerging tendencies in the implementation of the academic digitalization program. The verification process was conducted continuously throughout the research to ensure the accuracy and consistency of the findings. Data validity was ensured through triangulation techniques. Source triangulation was conducted by comparing information obtained from different participants, including teachers, school administrators, and students. Meanwhile, technique triangulation was carried out by comparing data collected through interviews, observations, and documentation such as school policy documents, digital learning records, and lesson plans. This triangulation process helped ensure the credibility and consistency of the research findings.

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Results and Discussion

Implementation of Academic Digitalization in Learning Planning

The findings indicate that academic digitalization at MA Negeri 2 Pati has been systematically integrated into the lesson planning stage. Teachers no longer rely solely on conventional planning practices but have incorporated digital platforms in developing lesson plans, managing instructional materials, and preparing learning media. Digital-based lesson planning enables teachers to access diverse, up-to-date, and relevant digital learning resources aligned with students' characteristics.

The utilization of e-learning platforms, Google Classroom, and other supporting digital tools assists teachers in organizing learning materials, assignments, and assessments in a more structured manner. Teachers are able to design learning activities by integrating digital learning resources such as instructional videos, interactive modules, and multimedia-based teaching materials. This finding is consistent with (A. D. Putra et al., 2025), who states that academic digitalization encourages a shift in lesson planning from static approaches to more flexible and adaptive practices that respond to students' learning needs.

Furthermore, digital-based lesson planning encourages teachers to be more reflective in determining instructional strategies (Suyadnya, 2024). Teachers consider not only learning objectives and competency achievement but also technological readiness, students' access to digital tools, and appropriate evaluation methods for digital learning environments. Thus, academic digitalization functions as a pedagogical support instrument that enhances the quality of lesson planning, rather than merely serving as an administrative tool (Akbar & Noviani, 2019).

The integration of digital technology in learning planning indicates that teachers are beginning to combine technological knowledge with pedagogical strategies and subject content. This reflects the interaction described in the Technological Pedagogical Content Knowledge (TPACK) framework, which emphasizes the integration of technology, pedagogy, and content in effective digital learning environments (Koehler et al., 2017). In addition, the availability of digital platforms and institutional policies supporting digital learning reflects the development of a digital ecosystem within the school environment, where technological infrastructure, human resources, and organizational support interact to facilitate the digital transformation of learning (Selwyn, 2016).

Implementation of Academic Digitalization in Learning Implementation

At the learning implementation stage, academic digitalization at MA Negeri 2 Pati is evident through the active use of various digital platforms and media by both teachers and students. Google Classroom serves as the primary platform for distributing learning materials, collecting assignments, and facilitating academic communication between teachers and students. In addition, teachers utilize interactive learning media such as digital presentations, instructional videos, and other supporting applications to create a more engaging and participatory learning environment.

The role of teachers in digital-based learning has undergone a significant shift. Teachers no longer function as the sole source of information but act as facilitators who guide students in accessing, understanding, and critically processing digital information. Students are encouraged to become more independent learners, manage their time effectively, and take responsibility for online learning tasks. This finding supports the view of (Setiyono et al., 2025), who argue that academic digitalization promotes student-centered learning.

However, the study also reveals variations in the level of technology utilization among teachers (Subroto et al., 2023). Differences in digital literacy skills have resulted in

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uneven implementation of digital learning. While some teachers have been able to optimize technology creatively, others still use digital platforms in a limited manner (Diputra et al., 2020). This condition indicates that the success of academic digitalization is influenced not only by the availability of technology but also by the competence and readiness of human resources.

The use of digital platforms in classroom activities also illustrates how the digital ecosystem in the school supports learning interactions. Digital learning platforms enable communication between teachers and students, facilitate the distribution of learning materials, and support collaborative learning activities. Within the digital ecosystem perspective, these technologies function as interconnected components that support teaching and learning processes within the educational environment (Selwyn, 2016). At the same time, teachers' ability to use these platforms effectively reflects the integration of technological, pedagogical, and content knowledge as emphasized in the TPACK framework (Koehler et al., 2017).

Implementation of Academic Digitalization in Learning Evaluation

Academic digitalization at MA Negeri 2 Pati is also applied in the learning evaluation process through the use of digital assessment systems, such as Computer-Based Tests (CBT) and e-report cards. Digital evaluation systems facilitate teachers in managing student grades, providing timely feedback, and monitoring students' learning progress continuously. As a result, the evaluation process becomes more transparent, accurate, and well-documented.

The use of digital evaluation has a positive impact on learning effectiveness. Teachers are able to analyze learning outcomes more systematically and data-driven, enabling them to design appropriate follow-up actions. Students also gain clearer insights into their learning achievements and assessment results. This finding aligns with (Aziz et al., 2023), which emphasizes that digital-based evaluation systems support improved accountability and the quality of academic services.

Nevertheless, digital-based evaluation also presents challenges, particularly related to infrastructure readiness and students' digital literacy (Trenggono Hidayatullah et al., 2023). Some students still require guidance to use digital evaluation systems effectively. Therefore, continuous assistance and habituation are essential to ensure that digital evaluation genuinely supports the achievement of learning objectives. Digital-based evaluation systems such as online quizzes and digital assignments also reflect the interaction between technological tools and pedagogical assessment strategies. In the TPACK framework, the integration of digital technology in evaluation allows teachers to design more flexible and efficient assessment processes (Koehler et al., 2017). From a broader perspective, the use of digital evaluation platforms also demonstrates how different components of the educational digital ecosystem such as digital infrastructure, teacher competence, and institutional policies, work together to support technology-based learning assessment (Selwyn, 2016).

Impact of Academic Digitalization on Learning Quality

The results show that the implementation of academic digitalization at MA Negeri 2 Pati contributes positively to the improvement of learning quality. This is reflected in increased effectiveness in learning management, easier access to learning resources, and improvements in students' academic and non-academic achievements. Students' accomplishments in various competitions indicate that academic digitalization affects not only administrative efficiency but also the development of students' potential and competencies.

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Table 1. Students' Achievements

Title	Ranking	Level
International World Invention Competition and Exhibition at SEGi University Malaysia	Gold Medal	Internasional
POPDA Cabor Wushu 2025	Bronze Medal	Provinsi
Rois Tasyrifat Festival Bahasa Arab	Juara 3	Nasional
Olimpiade Sains Madrasah Jateng 2025 (Kimia)	Bronze Medal	Provinsi
Olimpiade Sains Madrasah Jateng 2025 (Ekonomi)	Bronze Medal	Provinsi
IIQ Fest Story Telling	Juara 2	Nasional
Olimpiade Penelitian Siswa Indonesia (OPSI) 11 Judul IPS dan IPT	Lolos Penelitian	Nasional
Olimpiade PAI Cendekiawan useum 2025	Juara 1	Nasional
Karya Tulis Ilmiah Kebumian	Juara 1	Nasional
Esai Penalaran Eureka	Juara 1	Provinsi
Esai Safety Competition 2025	Juara 1	Nasional
Asean Innovative Science, Environmental, and Entrepreneur Fair (AISEEF) 2025	Gold Medal	Nasional

Academic digitalization enables the madrasah to develop a more adaptive, efficient, and sustainable learning system. The integration of technology in learning helps create an educational ecosystem that supports the development of 21st-century skills, including critical thinking, creativity, collaboration, and digital literacy. Therefore, academic digitalization at MA Negeri 2 Pati can be understood as a strategic effort to improve educational quality that is inseparable from institutional policies and school culture. The implementation of academic digitalization in MA Negeri 2 Pati also shows a positive impact on the quality of learning. Digital technologies enable teachers to deliver learning materials more effectively, facilitate interactive learning activities, and provide more flexible access to educational resources. The use of digital platforms also allows students to participate more actively in the learning process through online discussions, digital assignments, and collaborative learning activities.

Previous studies have shown that the integration of digital technology in education can significantly improve learning effectiveness, student engagement, and access to learning resources. Digital learning environments provide opportunities for more flexible and student-centered learning processes compared to conventional teaching approaches (Nugroho & Suryadi, 2020). In addition, research conducted by (Syafawani & Prasetyo, 2024) indicates that digital transformation in schools contributes to improving the quality of learning by supporting innovative teaching strategies and expanding students' learning experiences through technology-based resources. Therefore, the implementation of academic digitalization not only supports administrative efficiency but also plays an important role in enhancing the overall quality of the learning process.

From the perspective of digital ecosystem theory, the improvement in learning quality occurs because digital technologies interact with various elements within the school environment, including teachers, students, digital infrastructure, and institutional policies. When these elements are interconnected and function effectively, they create a supportive digital ecosystem that enhances the overall learning experience (Selwyn, 2016). In addition, teachers' ability to integrate digital technology with pedagogical strategies and subject content further strengthens the quality of learning, as emphasized in the TPACK framework (Koehler et al., 2017).

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Conclusion

Based on the research findings and discussion, it can be concluded that the implementation of academic digitalization in the learning process at MA Negeri 2 Pati has been carried out in a planned and integrated manner within the madrasah's academic activities. Academic digitalization is not merely applied as a technological innovation but has become an integral part of the school's operational system, encompassing lesson planning, learning implementation, and learning evaluation. At the lesson planning stage, teachers have utilized various digital platforms to develop instructional documents, organize learning materials, and design more varied and contextual learning media. Digitalization supports teachers in planning learning activities that are more flexible and responsive to students' needs. In the implementation stage, the use of e-learning platforms, Google Classroom, and interactive learning media encourages more active, collaborative, and student-centered learning, with teachers assuming the role of learning facilitators. In terms of evaluation, academic digitalization through digital assessment systems such as Computer-Based Tests (CBT) and e-report cards enhances the effectiveness, transparency, and accuracy of learning assessment. Teachers are able to monitor students' learning progress continuously, while students receive faster and clearer feedback on their learning outcomes. Overall, the implementation of academic digitalization at MA Negeri 2 Pati contributes positively to improving learning quality and students' academic achievements. However, this study also reveals that the success of academic digitalization is still influenced by the readiness of human resources, particularly the digital literacy competencies of teachers and students, as well as the pedagogical optimization of digital platform utilization. Therefore, academic digitalization should be viewed not merely as the provision of technology, but as a continuous process of learning transformation.

Recommendation

Based on the research conclusions, several recommendations can be proposed. The madrasah is expected to continuously strengthen institutional policies and support for the implementation of academic digitalization, particularly through the provision of adequate infrastructure and the development of integrated digital systems. Academic digitalization should be embedded in the school's strategic planning to ensure its sustainability and tangible impact on learning quality. The teachers should be continuously encouraged to enhance their digital literacy and digital pedagogical competencies through training programs, mentoring, and professional learning communities. Strengthening these competencies is essential to ensure that technology utilization goes beyond technical use and effectively supports meaningful, student-centered learning. Students need to be equipped with digital literacy skills, learning autonomy, and ethical awareness in the use of technology to enable them to participate in digital learning optimally and responsibly. Continuous guidance and habituation in using digital platforms are important factors in fostering a technology-based learning culture. And for future researchers are recommended to examine the implementation of academic digitalization using different approaches and perspectives, such as quantitative or mixed-methods research. Further studies may also expand the focus to investigate the impact of digitalization on learning outcomes, student motivation, or character development, as well as explore other school or madrasah contexts to obtain more comprehensive findings.

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