

# Digital Transformation in Strengthening the Pedagogic and Professional Competence of Madrasah Teachers through the Utilization of Service Administration Information System (SIAP)

Muhibut Tibri<sup>1</sup>, Rahmat Hidayat<sup>2</sup>, Jamilus<sup>3</sup>

<sup>1</sup> UIN Mahmud Yunus Batusangkar, [muhibuttibri2@gmail.com](mailto:muhibuttibri2@gmail.com)

<sup>2</sup> UIN Mahmud Yunus Batusangkar, [rahmathidayat@uinmybatusangkar.ac.id](mailto:rahmathidayat@uinmybatusangkar.ac.id)

<sup>3</sup> UIN Mahmud Yunus Batusangkar, [jamilus@uinmybatusangkar.ac.id](mailto:jamilus@uinmybatusangkar.ac.id)

\* 085355767253

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## Abstract

The rapid development of digital technology has encouraged madrasahs to adopt information systems to improve educational services and teacher performance. This study aims to identify and analyze the planning, implementation, and evaluation of the utilization of the Administrative Service Information System (SIAP) in improving the pedagogical competence and professionalism of madrasah teachers. A qualitative approach with a case study design was employed. Research participants consisted of madrasah principals, teachers, SIAP operators, and administrative staff involved in system implementation. Data were collected through in-depth interviews, observations, and documentation studies and analyzed using the interactive model of Miles, Huberman, and Saldaña, including data condensation, data display, and conclusion drawing. The findings indicate that SIAP utilization was systematically planned through needs assessment, program design, infrastructure preparation, and user training. Its implementation improved administrative efficiency, facilitated access to educational information, reduced teachers' administrative workload, and enabled greater focus on teaching and learning activities. Furthermore, the system contributed to enhancing teachers' digital literacy and professional competence. Regular evaluation through monitoring, supervision, and user feedback helped identify challenges and improve system effectiveness. Overall, SIAP positively contributes to strengthening pedagogical competence, teacher professionalism, and the digital transformation of madrasah education.

## Keywords

Administrative Service Information System, Digital Transformation, Madrasah, Pedagogical Competence, Teacher Professionalism.



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## INTRODUCTION

The development of information and communication technology has brought significant changes in various aspects of life, including in the field of education (Mulyasa & Raharjo, 2023). Digital transformation encourages educational institutions to develop a work system

that is more effective, efficient, and adaptive to the changing times (Cheng & Wang, 2022). Digitalization not only serves as a means of modernizing administration, but also becomes an important instrument in improving the quality of educational human resources (Saputra, 2024). In the context of Islamic education, madrasahs are required to be able to integrate technology into the education management system without ignoring Islamic values that are its main characteristics.

Improving the quality of madrasah education is highly dependent on the quality of teachers as the main implementers of the learning process. Teachers have a strategic role in planning, implementing, and evaluating learning so that the success of education cannot be separated from their competencies (Safitri et al., 2023). Law Number 14 of 2005 concerning Teachers and Lecturers explains that teachers must have pedagogical, professional, social, and personality competencies. Among the four competencies, pedagogic and professional competence is an aspect that is directly related to the quality of learning and the professionalism of teachers in carrying out their duties.

Pedagogic competence reflects the teacher's ability to understand the characteristics of students, prepare learning plans, carry out effective learning, and conduct evaluations to improve learning outcomes (Rosni, 2021). Meanwhile, professional competence is related to the ability of teachers to master learning materials, develop themselves sustainably, utilize educational technology, and show a professional attitude in carrying out their duties and responsibilities (Khafifah et al., 2024). These two competencies are important indicators in realizing quality learning and oriented to the needs of students (Mujiono, 2020).

Nevertheless, various challenges are still faced by madrasah teachers in carrying out their professional duties. One of the challenges that is often found is the high administrative burden that must be solved by teachers. The preparation of learning tools, management of academic documents, reporting activities, data archiving, and various other administrative tasks often take considerable time. This condition causes some teachers to experience limited time to develop learning innovations, reflect on the teaching and learning process, and improve professional competence on an ongoing basis.

The development of digital technology provides opportunities to overcome these various obstacles through the use of educational information systems (Amaluddin & Machali, 2022). Digitization of education administration allows various activities that were previously carried out manually to be managed more quickly, systematically, and integrated. The presence of an information system not only serves to improve administrative efficiency, but can also support the strengthening of teachers' competencies through easy access to information, data management, and the provision of more effective educational services (Ariadi et al., 2025).

One of the digital innovations used in the madrasah environment is the Service Administration Information System (SIAP). This system was developed as a platform that supports the management of education administration and personnel services digitally. Through SIAP, various administrative needs can be carried out online to facilitate the process of document archiving, activity reporting, data management, and other administrative

services. The presence of this system is expected to be able to create more effective educational governance while supporting the improvement of the quality of teachers' work.

The use of SIAP in the madrasah environment is not only related to the use of technology as an administrative tool, but also related to changes in teachers' work patterns in carrying out their professional duties. Through an integrated system, teachers gain convenience in compiling and managing learning documents, accessing information quickly, and carrying out various administrative activities more efficiently. This condition has the potential to provide a wider space for teachers to focus on developing the quality of learning and improving professional competence.

From the perspective of digital transformation of education, the success of an information system is not only measured from the technical aspects of use, but also from how the system is able to contribute to improving the quality of human resources (Prasojo & Setiawan, 2022). Therefore, it is important to understand how the process of planning, implementing, and evaluating the use of SIAP is carried out in the madrasah environment and how the process contributes to strengthening the pedagogic and professional competence of teachers.

Research Kamal & Anwar, (2022) Discussing the effectiveness of the educational information system from the aspects of administrative services, institutional governance, and work efficiency. Meanwhile, research that specifically examines the process of utilizing SIAP in improving the pedagogic and professional competence of madrasah teachers is still relatively limited. In addition, studies that highlight the stages of planning, implementing, and evaluating the use of SIAP as part of the digital transformation of education have also not been found. In fact, these three aspects are important elements in ensuring the successful implementation of an educational information system.

Based on these conditions, research is needed that is able to provide an in-depth overview of how the use of the Service Administration Information System (SIAP) is implemented in madrasahs and how the system contributes to improving the pedagogic and professional competence of teachers. This study is expected to make a theoretical contribution to the development of literature on the digital transformation of Islamic education and become a consideration for policymakers in improving the quality of technology-based madrasah education services.

Therefore, this study aims to find out and analyze the planning, implementation, and evaluation of the use of the Service Administration Information System (SIAP) in improving the pedagogic competence and professionalism of madrasah teachers.

## **METHODS**

This study uses a qualitative approach with a case study type to gain an in-depth understanding of the use of Service Administration Information System (SIAP) in improving the pedagogic competence and professionalism of madrasah teachers. This approach was chosen because the research focuses on revealing the phenomena, experiences, and practices

that occur in the process of planning, implementing, and evaluating the use of SIAP in the madrasah environment. The research location was chosen purposively in madrasahs that have implemented SIAP in the management of educational administration and services. The research informants consist of madrasah heads, teachers, SIAP operators, and administrative personnel who are directly involved in the use of the system.

Data collection was carried out through in-depth interviews, observations, and documentation studies. Interviews are used to obtain information about the planning process for the use of SIAP, program implementation, perceived benefits, and evaluations carried out by the madrasah. Observation was carried out to directly observe the activities of using SIAP in supporting administrative and learning tasks, while documentation was used to complete data through various documents related to the implementation of SIAP, such as work programs, activity reports, digital administrative archives, and other supporting documents.

Data analysis was carried out using the interactive model of Miles, Huberman, and Saldaña which included data condensation, data presentation, and conclusion drawn. The analysis process is carried out continuously from the time the data is collected until the research is completed. To ensure the validity of the data, the researcher applied source triangulation and triangulation techniques by comparing the results of interviews, observations, and documentation (Miles & Huberman, 2014). In addition, member checking is carried out on informants to ensure that the data and interpretations obtained are in accordance with the actual conditions in the field.

## **FINDINGS AND DISCUSSION**

### **Findings**

#### **Planning for the Utilization of Service Administration Information System (SIAP) in Improving Pedagogic Competence and Professionalism of Madrasah Teachers**

Based on the results of interviews, observations, and documentation studies, it is known that the planning for the use of the Service Administration Information System (SIAP) is carried out in stages and involves various parties in the madrasah environment. The planning stage begins with the identification of the need for a madrasah for a more effective and efficient administrative system. Before SIAP was implemented, most administrative activities were still carried out manually, so it took a long time in document management, archive storage, report preparation, and administrative services to teachers. This condition causes administrative work to become more complex and has the potential to reduce teachers' time in preparing for learning and developing their professional competencies. Therefore, the madrasah views the need for a digital system that can help simplify various administrative tasks so that teachers can focus more on their main tasks as educators.

The head of the madrasah has an important role in the planning process for the use of SIAP. Based on the results of the interview, the head of the madrasah explained that the implementation of SIAP was designed as part of the madrasah quality development program

and digital transformation of education. Planning is carried out through a coordination meeting involving elements of madrasah leaders, teachers, administrative staff, and system operators. In the meeting, various aspects related to user needs, the readiness of human resources, the availability of information technology facilities and infrastructure, as well as the strategy for implementing the system so that it can be used optimally by all madrasah residents, were discussed. Through the forum, all parties were given the opportunity to convey their needs, expectations, and inputs related to the use of SIAP so that the system implemented was in accordance with the conditions and needs of the madrasah.

The results of the study show that the planning for the use of SIAP is not only oriented towards the digitization of administration, but is also directed to support the improvement of pedagogic competence and teacher professionalism. This can be seen from the various programs that were prepared before the implementation of the system was carried out. Teachers are given an understanding of the benefits of SIAP in supporting learning tasks, managing classroom administration, storing learning tools, and archiving academic documents. Through this socialization, teachers began to understand that the use of technology is not only to facilitate administrative work, but also as a means to improve the effectiveness and quality of their professional performance.

In the planning stage, madrasahs also map teachers' digital capabilities. Based on the results of interviews with SIAP operators, teachers' abilities in using information technology are still diverse. Some teachers are used to using various digital applications in learning activities, while others still need intensive assistance in operating technology-based systems. Therefore, madrasahs develop training and technical guidance programs as part of the SIAP's implementation strategy. The program aims to improve teachers' digital literacy while ensuring that all teachers have adequate abilities to utilize the system to be used.

In addition to training, planning also includes the provision of supporting facilities and infrastructure. Based on the results of observations, the madrasah has prepared an internet network, computer devices, and other supporting facilities needed in the use of SIAP. The madrasah realizes that the success of the implementation of information systems is greatly influenced by the availability of adequate technological infrastructure. Therefore, various technical needs are prepared before the system is fully used by all teachers and education staff. These preparations are made to minimize technical obstacles that can interfere with the implementation of the program.

The documentation study shows that planning for the use of SIAP is also realized in the form of preparing guidelines for the use of the system, the division of user tasks and responsibilities, and the determination of operational procedures that must be followed by all users. The document is a reference for teachers and administrative staff in carrying out various activities related to the use of SIAP. The existence of operational guidelines and procedures helps to create uniformity in the use of the system and facilitate the supervision and evaluation process carried out by the madrasah.

The findings of the study show that the planning for the use of SIAP is carried out in a systematic, structured, and oriented manner to user needs. The involvement of various parties in the planning process contributes to the readiness of madrasahs in implementing the system. In addition, attention to aspects of improving teachers' digital competence, providing supporting infrastructure, and policy formulation of system use shows that SIAP planning does not only focus on administrative aspects, but is also directed to support the improvement of pedagogic competence and professionalism of madrasah teachers in a sustainable manner.

### **Implementation of the Utilization of the Service Administration Information System (SIAP) in Improving the Pedagogic Competence and Professionalism of Madrasah Teachers**

Based on the results of interviews, observations, and documentation studies, the implementation of the use of the Service Administration Information System (SIAP) in madrasahs was carried out after all stages of planning, socialization, and training to users were completed. The implementation of SIAP begins with the use of the system in various educational administration activities that were previously carried out manually. Teachers, administrative staff, and madrasah operators have begun to utilize the system for document management, digital archive storage, personnel administration services, educational data management, and various other administrative needs. Based on the results of observations, the use of SIAP has become part of the routine activities of madrasahs so that most administrative services can be carried out more quickly, structured, and well documented.

The results of interviews with teachers show that the implementation of SIAP provides convenience in completing various administrative tasks that have required considerable time and effort. Before using SIAP, teachers must compile, store, and search various documents manually so that they often experience obstacles in managing archives and reporting activities. Once the system is in place, various documents can be stored digitally and re-accessed more easily when needed. This condition has a positive impact on the effectiveness of teachers' work because the time previously used to manage administration can be diverted to prepare for learning activities and professional development.

The implementation of SIAP also shows a significant contribution to improving teachers' pedagogic competence. Based on the results of the interview, the teacher revealed that the reduced administrative burden provides a wider opportunity to develop learning tools in a better and planned manner. Teachers have more time to compile teaching modules, develop learning media, design assessments, and reflect on the learning process that has been implemented. In addition, easy access to educational data and information helps teachers make more informed decisions regarding the needs of students and the learning strategies to be used.

The results of observations show that the use of SIAP indirectly encourages teachers to more actively utilize technology in the implementation of their duties. Teachers are getting used to using various digital devices in managing administration and learning activities. The

ability to operate systems, manage digital documents, and utilize information technology is part of daily professional activities. This condition shows that the implementation of SIAP not only results in changes to the administrative system, but also forms a digital work culture in the madrasah environment.

From the aspect of professionalism, the implementation of SIAP has a considerable impact on improving the quality of teachers' work. Based on the results of interviews with the head of the madrasah, the use of digital systems makes teachers' work more measurable, documented, and easy to monitor. Various administrative activities that were previously difficult to control can now be monitored through an integrated system. Teachers become more disciplined in completing assignments, more responsible for document management, and better prepared to meet administrative needs related to their professional duties. This condition shows that the use of SIAP contributes to the formation of a more professional and accountable work culture.

In addition to increasing work effectiveness, the implementation of SIAP also contributes to improving teachers' digital literacy. Based on the results of interviews with system operators, at the beginning of the implementation there were still some teachers who had difficulties in operating the application. However, along with continuous assistance and use, teachers' ability to utilize technology has increased significantly. Teachers become more confident in using digital applications and are more open to various technological innovations that can support educational tasks. These changes show that the use of SIAP has become an effective learning tool in improving teachers' digital competence.

Documentation studies show that the implementation of SIAP is supported by various mentoring and monitoring activities carried out periodically by the madrasah. The system operator provides technical assistance to teachers who experience problems, while the head of the madrasah supervises the effectiveness of the use of the system in supporting the implementation of educational tasks. Continuous assistance helps ensure that all users can use the system according to the goals that have been set at the planning stage.

Overall, the results of the study show that the implementation of SIAP has gone well and has made a positive contribution to improving the pedagogic competence and professionalism of madrasah teachers. This system not only makes it easier to manage education administration, but also helps teachers optimize time, improve technology skills, strengthen professional work culture, and support more effective learning. Thus, SIAP is one of the important instruments in supporting the digital transformation of education and strengthening the quality of human resources in the madrasah environment.

### **Evaluation of the Utilization of Service Administration Information System (SIAP) in Improving Pedagogic Competence and Professionalism of Madrasah Teachers**

Based on the results of interviews, observations, and documentation studies, the evaluation of the use of the Service Administration Information System (SIAP) is carried out periodically by the madrasah to determine the level of success of the implementation of the

system and its impact on improving pedagogic competence and teacher professionalism. The evaluation was carried out through coordination meetings, monitoring the use of the system, supervision of the head of the madrasah, and collecting input from teachers, operators, and administrative staff. Evaluation activities are carried out not only to assess the technical aspects of the use of SIAP, but also to identify changes that occur in teachers' work patterns after the system is implemented. With continuous evaluation, madrasahs can find out the various advantages, obstacles, and development needs needed to optimize the use of SIAP.

The results of the interview with the head of the madrasah show that the evaluation was carried out by paying attention to the achievement of the goals that had been set at the planning stage. Some of the indicators that are the focus of the evaluation include the level of use of the system by teachers, the completeness of the administration produced, the effectiveness of document management, the speed of administrative services, and the system's contribution to the implementation of learning tasks. Based on the results of the evaluation, most teachers have been able to utilize SIAP in various administrative activities independently. Documents that were previously stored in physical form have now been digitized so that they are easier to access, update, and reuse when needed. In addition, the administration process becomes faster and more efficient than before the use of the system.

From the aspect of pedagogic competence, the results of the evaluation show that the use of SIAP has a positive impact on teachers' ability to plan and manage learning. The reduced time spent on administrative work provides a greater opportunity for teachers to focus on the preparation of learning tools, the development of learning media, the implementation of assessments, and reflection on the learning process that has been implemented. Based on the teacher's information, the ease of managing and storing learning documents through digital systems helps them work more regularly and systematically. This condition shows that the use of SIAP supports the creation of more effective and professional learning management.

The results of the evaluation also show an increase in teachers' professional competence, especially in the aspects of digital literacy and adaptability to information technology. Before the implementation of SIAP, there were still some teachers who had limitations in the use of digital applications. However, after the system is used continuously and supported by various mentoring activities, teachers' ability to operate technology has developed quite well. Teachers become more accustomed to using digital systems in carrying out administrative tasks and are better prepared to face various demands of digital transformation in the educational environment. The improvement of this ability shows that SIAP not only functions as an administrative tool, but also as a learning medium for teachers in developing their professional competencies.

However, the results of the evaluation also found several obstacles that are still faced in the use of SIAP. Based on the interview results, the most common obstacles that arise are related to the unstable quality of the internet network, the limitations of technological devices for some users, and differences in the level of digital skills between teachers. Some

teachers who are older need longer to adapt to the use of technology-based systems. In addition, some features in the application still require further explanation and training so that they can be used optimally by all users. These obstacles are the concern of the madrasah in an effort to increase the effectiveness of the implementation of the system in the future.

As a follow-up to the results of the evaluation, the madrasah carried out various improvement and development efforts. The head of the madrasah together with the SIAP operator regularly holds training, technical assistance, and shares good practices regarding the use of the system. In addition, madrasahs continue to strive to improve the quality of information technology facilities and infrastructure, including the provision of a more adequate internet network and the optimization of supporting devices used in the operation of the system. These efforts are made to ensure that all teachers can make optimal use of SIAP and get maximum benefits from the use of the system.

Overall, the results of the evaluation show that the use of the Service Administration Information System (SIAP) has made a positive contribution to improving the pedagogic competence and professionalism of madrasah teachers. This system is able to increase administrative effectiveness, strengthen teachers' digital literacy, support the implementation of more planned learning, and build a more professional and accountable work culture. Although there are still some technical obstacles and user adaptation, various improvement efforts made by madrasahs show a strong commitment to optimizing the use of SIAP as part of the sustainable digital transformation of education.

## **Discussion**

The results of the study show that the use of the Service Administration Information System (SIAP) in improving the pedagogic competence and professionalism of madrasah teachers is carried out through the stages of planning, implementation, and evaluation that are integrated with each other. These findings indicate that the success of digital transformation in education depends not only on the availability of technology, but also on the quality of implementation management implemented by educational institutions. In this context, SIAP functions as a strategic instrument that helps madrasahs optimize administrative management while supporting the development of teacher competencies in a sustainable manner.

At the planning stage, madrasahs identify needs, prepare programs, provide facilities and infrastructure, and implement training for teachers and education staff. These findings show that the implementation of educational information systems requires comprehensive planning so that organizational goals can be achieved optimally. According to Azizah & Mulyani, (2025), the success of educational digitalization is greatly influenced by the readiness of organizations in designing implementation strategies, allocating resources, and building user capacity before technology is implemented. The findings of this study are also in line with the research Ghavifekr & Rosdy, (2021) which explains that education information systems that are systematically planned tend to have a higher implementation success rate than programs that are only oriented towards technology procurement.

The involvement of madrasah heads, teachers, SIAP operators, and administrative staff in the planning process shows the application of participatory principles in program management. These findings reinforce the results of the study Alenezi & Akour, (2026) which states that transformational and collaborative leadership is an important factor in the success of digital transformation in Islamic educational institutions. The involvement of various parties from the early stages of implementation allows for a common perception, an increased sense of belonging to the program, and better readiness to face changes. In addition, research by Triwiyanto and Gunawan (2024) shows that the active participation of stakeholders in the planning of educational information systems contributes to increasing the effectiveness of the use of technology in the school environment.

At the implementation stage, the results of the study show that SIAP has been used in various educational administration activities, such as document management, digital archive storage, administrative services, and education data management. These findings prove that administrative digitalization is able to increase the efficiency and effectiveness of education governance. The results of this study are in line with the research Nurhadi & Fitria, (2024) who found that the use of Educational Management Information Systems (EMIS) can increase the speed of administrative services, reduce data mismanagement, and strengthen the accountability of educational organizations. Similarly, Lestari & Pratama, (2025) concluded that the school administration information system is able to reduce the administrative burden on teachers and improve the quality of educational services.

From the aspect of pedagogic competence, this study found that the use of SIAP provides a wider opportunity for teachers to focus on learning activities. Reduced administrative burden allows teachers to have more time to develop learning tools, develop learning media, carry out assessments, and reflect on learning. These findings are in line with research Hakim & Rahman, (2024) which states that the integration of technology in the education system is able to improve the quality of learning planning and implementation because teachers can allocate more time to academic activities than administrative work. In addition, Fitriani & Yuliana, (2023) It found that the effective use of educational technology can strengthen teachers' pedagogic competence, especially in designing more structured and student-oriented learning.

The findings of the study also show that SIAP helps teachers manage learning documents in a more systematic and accessible manner. This condition supports the data-driven decision-making process in learning. These results are in line with the theory of Technological Pedagogical Content Knowledge (TPACK) put forward by Koehler et al., (2021), which explains that the integration of technology in educational practice can improve teachers' ability to manage learning effectively. With an integrated information system, teachers can make more optimal use of educational data to support a quality learning process.

From the aspect of professional competence, the results of the study show that the implementation of SIAP encourages teachers to improve their technology and digital literacy

skills. Teachers are required to understand various system features, manage digital documents, and utilize information technology to support their professional duties. These findings are in line with research Basri & Nurhayati, (2021) which states that digital literacy is one of the main components of teachers' professional competence in the era of digital transformation. Research Adilah & Suryana, (2021) It also shows that the higher the level of digital literacy of teachers, the higher the professional abilities shown in the implementation of educational tasks.

The results of this study support the findings Baharuddin & Suryadi, (2024) which explains that the continuous use of information technology is able to increase teachers' confidence in integrating technology into their professional work. Teachers not only become users of technology, but also develop into agents of change who are able to utilize technology to improve the quality of educational services. In the context of madrasas, the use of SIAP has formed a more effective, transparent, and accountable work culture so as to support the continuous improvement of teacher professionalism.

At the evaluation stage, this study found that madrasas routinely conduct monitoring, supervision, coordination meetings, and collecting user feedback to assess the effectiveness of the use of SIAP. These findings show that evaluation is an important part in ensuring the sustainability of the implementation of educational information systems. According to Aslan & Wahyudin, (2023), periodic evaluations allow educational institutions to identify weaknesses in the system, measure the success rate of implementation, and formulate necessary improvement strategies. Similar findings were also put forward by Budiarto and Kurniawan (2025) who stated that the success of the use of educational information systems is greatly influenced by the monitoring and evaluation process that is carried out on an ongoing basis.

So the results of the study show that the use of the Service Administration Information System (SIAP) makes a significant contribution to improving the pedagogic competence and professionalism of madrasah teachers. These findings reinforce various previous studies that state that educational information systems are able to improve administrative efficiency, strengthen digital literacy, improve learning quality, and encourage teacher professionalism. Thus, SIAP not only functions as a digital administration tool, but also becomes a strategic instrument in supporting the digital transformation of madrasah education and teacher competency development in the era of technology-based education.

## **CONCLUSION**

Based on the results of the study, it can be concluded that the use of the Service Administration Information System (SIAP) in improving the pedagogic competence and professionalism of madrasah teachers is carried out through three main stages, namely planning, implementation, and evaluation. At the planning stage, madrasas identify needs, prepare programs, provide facilities and infrastructure, as well as implement socialization and training for teachers and education staff. Planning that is carried out systematically and

involving various parties is an important factor in supporting the successful implementation of SIAP in the madrasah environment.

At the implementation stage, SIAP is used in various educational administration activities so as to increase the effectiveness and efficiency of document management, archive storage, and other administrative services. The use of this system makes it easier for teachers to carry out administrative tasks so that they have more time to plan, implement, and evaluate learning. In addition, the use of SIAP also encourages the improvement of teachers' digital literacy, forms a more professional work culture, and improves teachers' ability to utilize information technology to support educational tasks.

At the evaluation stage, madrasahs periodically monitor, supervise, and collect feedback from users to determine the effectiveness of using the system and identify various obstacles faced. The results of the evaluation show that SIAP provides significant benefits in supporting the improvement of pedagogic competence and teacher professionalism, although there are still several obstacles such as limited internet networks and differences in digital abilities between users. Therefore, continuous training, technical assistance, and strengthening of information technology infrastructure are needed so that the use of SIAP can run more optimally. Overall, this study shows that SIAP not only functions as a digital administration system, but also becomes a strategic instrument in supporting the digital transformation of madrasahs and strengthening teacher competencies in a sustainable manner.

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