

## Optimizing Educational Governance Through the Digitalization of School Administration Based on Information Systems

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### ABSTRACT

This study examines the optimization of educational governance through the digitalization of school administration based on information systems. It aims to analyze the effectiveness of digital systems in improving administrative efficiency, accuracy, and transparency. A mixed-method approach was employed, involving 35 respondents through questionnaires and 6 key informants via interviews in a public high school in Central Java. Quantitative data were analyzed using descriptive statistics, while qualitative data were thematically interpreted. The findings reveal that digitalization significantly enhances administrative performance and governance quality, although challenges remain in digital literacy and infrastructure. This study offers a novel integrated perspective on measuring governance improvement through digital transformation at the school level.

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## INTRODUCTION

Digital transformation in the education sector has become a strategic issue in efforts to improve the quality of educational governance globally. The advancement of information technology has driven significant changes in school administrative systems, shifting from manual-based processes to more efficient and integrated digital systems. Globally, the digitalization of educational administration has been proven to enhance transparency, accountability, and the effectiveness of school management (Williamson, 2020). In Indonesia, educational digitalization policies continue to be strengthened through the implementation of various information systems such as Dapodik and e-Rapor to support modern school management (Ministry of Education and Culture, 2021).

However, the implementation of digitalized school administration still faces various challenges, particularly in terms of human resource readiness and technological infrastructure. Studies indicate that the digital divide remains a major obstacle in the adoption of information systems in schools, especially in developing regions (Zhao & Frank, 2021). In addition, the level of digital literacy among educators and administrative staff significantly influences the effectiveness of system utilization in supporting educational governance (Howard et al., 2022). This suggests that digital transformation requires not only technological advancement but also organizational and individual readiness in its adoption.

Previous studies have extensively discussed digitalization in education; however, most have focused on digital learning rather than specifically examining school administration as part of governance. For instance, Selwyn (2020) highlighted the impact of digital technology on educational practices but did not directly link it to the optimization of school governance. Similarly, Bond et al. (2021) emphasized the use of technology in online learning without addressing its implications for administrative management. This gap indicates the need for research that specifically integrates administrative digitalization with educational governance.

Furthermore, research by Tondeur et al. (2021) revealed that successful integration of technology in education largely depends on institutional policies and school leadership. However, the study did not thoroughly examine the relationship between administrative information systems and the improvement of school governance quality. On the other hand, Kwet (2022) discussed issues of digital equity in education but did not address administrative efficiency as part of governance. Therefore, there is a need for research that fills this gap through a more comprehensive approach.

This study aims to analyze the effectiveness of digitalizing school administration based on information systems in optimizing educational governance. Specifically, it examines how information systems can improve efficiency, accuracy, and transparency in administrative management. In addition, the study seeks to identify supporting and inhibiting factors in the implementation of digitalization at the school level. Thus, this research is expected to provide a comprehensive understanding of the role of technology in enhancing educational governance.

The theoretical contribution of this study lies in the development of an integrated concept between administrative digitalization and educational governance, which remains relatively limited in the literature. This research enriches the field of educational management by introducing a new perspective that empirically links information systems with governance dimensions (Williamson et al., 2020). Moreover, it provides practical contributions for schools in designing and implementing digital-based administrative systems more effectively. The findings are expected to serve as a reference for policymakers in formulating sustainable digital education strategies.

In the local context, this study is relevant to the condition of schools in Indonesia, particularly in Central Java, which are undergoing a transition toward digital administrative systems. The implementation of information systems in public schools shows improvements in efficiency; however, it is not yet fully optimal due to various technical and non-technical constraints (Pratama & Surahman, 2023). This highlights the importance of in-depth empirical studies to understand the dynamics of digitalization implementation in practice. By employing a mixed-method approach, this study is expected to provide comprehensive and contextual analysis.

Overall, this study has high urgency in supporting inclusive and sustainable digital transformation in education. The integration of information systems in school administration not only impacts operational efficiency but also improves the overall quality of educational governance (Haleem et al., 2022). Therefore, this research is expected to contribute significantly to the development of policies and practices in educational management in the digital era. Ultimately, the findings are anticipated to serve as a foundation for strengthening technology-based educational governance systems in the future.

## LITERATURE REVIEW

### *Educational Governance in Educational Management Perspective*

Educational governance refers to a systematic framework that ensures transparency, accountability, effectiveness, and stakeholder participation in managing educational institutions. In contemporary discourse, governance is increasingly associated with data-driven decision-making supported by digital technologies, which enhance institutional performance and policy implementation (Peters, Pierre, & Sørensen, 2022). The integration of governance and digitalization enables schools to improve managerial efficiency and organizational accountability in a measurable manner.

In the Indonesian context, educational governance still faces structural challenges, particularly in administrative integration and institutional coordination across educational units (Mulyasa, 2022). Weak data synchronization and fragmented administrative systems often hinder effective decision-making processes. Therefore, the adoption of technology-based governance models becomes essential in strengthening school management practices and ensuring service quality improvement.

From a theoretical standpoint, governance can be explained through the Digital Governance Theory, which emphasizes the use of information technology

to enhance public sector performance and transparency (Dunleavy, Margetts, Bastow, & Tinkler, 2021). This theory highlights that digital systems are not merely tools but strategic instruments in achieving effective governance outcomes.

H1: Educational governance positively influences the quality of school administrative management.

### ***Digitalization of School Administration as Organizational Innovation***

Digitalization of school administration is a transformative process that shifts conventional administrative practices into integrated digital systems. This transformation is closely related to organizational innovation, where technology adoption reshapes workflows, communication patterns, and decision-making structures within educational institutions (Vial, 2021). The adoption of digital platforms enables schools to manage data efficiently, reduce redundancy, and improve service delivery.

Empirical studies demonstrate that digitalization contributes to operational efficiency and enhances administrative accuracy, particularly in managing student data, academic records, and institutional reporting systems (Crawford & Butler-Henderson, 2020). In Indonesia, the implementation of digital administrative systems such as school-based information systems has shown positive impacts, although the process remains uneven across regions (Rahmawati & Nugroho, 2023).

Despite these benefits, challenges persist in terms of digital readiness, infrastructure limitations, and resistance to technological change among educational staff. These barriers indicate that digital transformation requires not only technological investment but also human resource development and institutional support (Scherer, Siddiq, & Tondeur, 2021).

H2: Digitalization of school administration positively influences the efficiency and effectiveness of school management.

### ***Information Systems and Administrative Performance***

Information systems play a crucial role in enhancing administrative performance by enabling systematic data management and improving organizational decision-making. The Technology Acceptance Model (TAM) explains that user acceptance of information systems significantly affects their effectiveness in organizational settings (Venkatesh, Thong, & Xu, 2022). This highlights the importance of user readiness in ensuring the successful implementation of digital systems in schools.

Research indicates that the implementation of information systems significantly improves administrative efficiency, reduces processing time, and enhances data accuracy (Maroufkhani, Tseng, & Iranmanesh, 2020). In educational institutions, information systems facilitate integrated management of academic, financial, and operational data, contributing to improved organizational performance.

In Indonesia, studies show that school information systems have improved administrative transparency and accountability, although their effectiveness varies depending on infrastructure availability and staff competence (Setiawan & Widodo, 2024). These findings reinforce the importance

of aligning technological systems with organizational capacity to achieve optimal results.

H3: Information systems positively influence school administrative performance.

### *Integration of Digitalization and Educational Governance*

The integration of digitalization and educational governance represents a strategic approach in modern educational management. Digitalization enables governance processes to become more transparent, efficient, and data-oriented, thereby improving institutional performance (Lindgren & Van Veenstra, 2021). This integration reflects the shift toward smart governance, where technology supports evidence-based policy and decision-making processes.

International studies confirm that digital governance enhances public service quality, including in the education sector, by improving accessibility, efficiency, and responsiveness (Meijer & Bolívar, 2021). However, existing studies often analyze digitalization and governance separately, resulting in limited understanding of their combined impact.

In Indonesia, research on the integration of digital administration and governance remains limited, particularly at the school level (Halim & Prasetyo, 2022). This gap highlights the importance of conducting comprehensive studies that examine how digital systems contribute to improving governance quality in educational institutions.

H4: Digitalization of school administration based on information systems significantly influences the optimization of educational governance.

## **METHODOLOGY**

### *Types and Approaches to Research*

This study uses a mixed method approach with a sequential explanatory design, which combines quantitative and qualitative methods sequentially to obtain comprehensive results. The quantitative approach is used to measure the relationship between variables objectively, while the qualitative approach is used to deepen the understanding of the phenomenon being studied. This design was chosen because it is able to provide a more holistic analysis in examining the digitalization of education administration and governance (Creswell & Plano Clark, 2021). In addition, the use of mixed methods is considered effective in education management research because it is able to integrate numerical and narrative data simultaneously (Ivankova & Wingo, 2020).

### *Population and Sampling Techniques*

The population in this study is all educators and education staff at a public high school in Central Java who have implemented the school administration information system. The sampling technique used is probability sampling with a simple random sampling approach for quantitative data, so that each member of the population has the same opportunity to be selected as a respondent (Etikan & Bala, 2020).

The number of quantitative samples was set at 35 respondents, consisting of teachers, administrative staff, and school operators, with the criteria: (1) actively working for at least 1 year, (2) using the school information system, and (3) being involved in the administrative process. Meanwhile, for a qualitative

approach, purposive sampling techniques were used, with a total of 6 key informants, consisting of:

- 1 principal
- 1 Deputy Principal
- 1 Head of Administration
- 1 School Operator
- 2 teachers

The selection of informants is based on the consideration that they have direct knowledge and experience related to the implementation of school administration digitalization (Palinkas et al., 2020).

#### ***Teknik Pengumpulan Data***

Data collection techniques are carried out through several methods, namely:

##### *Kuesioner (Quantitative)*

The questionnaire instrument was compiled using a Likert scale of 1–5 to measure the variables:

- Digitization of Administration
- Information Systems
- educational governance

The questionnaire items were adapted from previous research that has been tested for validity in the context of information systems and educational management (Hair, Page, & Brunsveld, 2020).

##### *Interview (Qualitative)*

The interviews were conducted in a semi-structured manner to dig up relevant information:

- Information System Implementation
- Digitalization Constraints
- Impact on governance

##### *Documentation*

Documentation is used to obtain supporting data such as administrative reports, system usage, and school policies related to digitalization.

#### ***Validity and Reliability Tests***

The validity test of the quantitative instrument was carried out using construct validity through Pearson correlation analysis, with the criteria of the value  $r$  calculated  $> r$  table (Field, 2020). Meanwhile, the reliability test was carried out using Cronbach's Alpha with a minimum value of 0.70 which indicates the internal consistency of the instrument (Taber, 2021). For qualitative data, validity is carried out through triangulation techniques of sources and methods, as well as re-checking informants (member checking) to ensure the accuracy of the data (Nowell et al., 2020).

#### ***Research Procedure***

The research procedure is carried out systematically through several stages, namely:

- Preparation stage: proposal preparation, literature study, and development of research instruments

- Stage of data collection: dissemination of questionnaires to respondents and conduct of interviews with informants
- Data processing stage: data coding, quantitative data input, and transcription of interview data
- Data analysis stage: statistical analysis and thematic analysis
- Reporting stage: preparation of research results and discussion

This procedure is designed to ensure the validity, reliability, and consistency of the overall research results.

#### ***Data Analysis Techniques***

Quantitative data analysis was carried out using:

- Descriptive statistics to describe the characteristics of the data
- Simple linear regression analysis to test relationships between variables
- Data processing is carried out using the latest version of SPSS.

Meanwhile, qualitative data analysis uses thematic analysis techniques, which include:

- Data Reduction
- Data Presentation
- Drawing conclusions

This approach allows researchers to identify patterns and meanings from interview data in depth (Braun & Clarke, 2021).

## **RESEARCH RESULT & DISCUSSION**

### ***The Effect of Educational Governance on the Quality of School Administration***

Table 1. Results of the Analysis of the Effect of Educational Governance on School Administration

<b>Variable</b>	<b>Regression Coefficient</b>	<b>t-value</b>	<b>Sig.</b>
Educational Governance	0.612	4.215	0.000

Based on the regression analysis results in Table 1, a coefficient value of 0.612 with a significance value of 0.000 ( $<0.05$ ) was obtained, indicating that educational governance has a positive and significant effect on the quality of school administration. This suggests that the better the educational governance implemented, the more optimal the administrative management in schools. This finding reinforces that aspects of transparency, accountability, and effectiveness in governance directly contribute to improving the quality of administrative services. Thus, hypothesis H1 is accepted.

These quantitative results are supported by qualitative findings indicating that governance practices based on information systems help clarify administrative workflows and decision-making processes. Informants emphasized that the presence of digital systems makes processes more structured and easier to monitor.

The interview excerpts are as follows: As stated by the principal: *“Now all the data is clear, so we can make decisions faster because everything is directly visible in the system”* (K-01, January 12, 2026). Furthermore, the vice principal stated: *“It*

used to be complicated because it was manual, now it's more organized, so coordination is much easier" (W-02, January 14, 2026). Qualitatively, these findings indicate that governance supported by digitalization improves clarity in work systems and organizational efficiency.

### ***The Effect of Administrative Digitalization on School Efficiency and Effectiveness***

Table 2. Results of the Analysis of Administrative Digitalization on Efficiency

<b>Variable</b>	<b>Regression Coefficient</b>	<b>t-value</b>	<b>Sig.</b>
Administrative Digitalization	0.587	3.982	0.001

The analysis results in Table 2 indicate that administrative digitalization has a positive and significant effect on the efficiency and effectiveness of school management, with a significance value of 0.001 (<0.05). This shows that the use of digital systems can accelerate administrative processes and reduce manual workloads. This efficiency is reflected in data processing, reporting, and the faster and more accurate distribution of information. Thus, hypothesis H2 is accepted.

Qualitative findings indicate that digitalization has a real impact on facilitating the work of administrative staff and teachers. Digital systems help reduce recording errors and improve the speed of data access. The interview excerpts are as follows: As stated by the head of administration: "Now it's much faster, before entering data could take hours, now it's just a few clicks" (T-03, January 16, 2026). Then the school operator stated: "Student data and grades are directly integrated, so there's no need to input them repeatedly" (O-04, January 18, 2026). Qualitatively, digitalization has proven to improve operational efficiency and reduce duplication of administrative work.

### ***The Effect of Information Systems on Administrative Performance***

Table 3. Results of the Analysis of Information Systems on Administrative Performance

<b>Variable</b>	<b>Regression Coefficient</b>	<b>t-value</b>	<b>Sig.</b>
Information Systems	0.645	4.567	0.000

The analysis results in Table 3 indicate that information systems have a positive and significant effect on school administrative performance. The significance value of 0.000 indicates a very strong relationship between the quality of information systems and the improvement of administrative performance. This suggests that a well-developed information system can enhance data accuracy, speed of information access, and the quality of administrative services. Thus, hypothesis H3 is accepted.

Qualitative findings indicate that information systems are the main factor in improving overall administrative performance. Informants mentioned that digital systems facilitate data management and improve the quality of work. The interview excerpts are as follows: As expressed by a teacher: "Now it's much easier,

grades go directly into the system, so there's no worry about losing or making mistakes" (G-05, January 20, 2026). Another teacher stated: "Administration is now more organized and easier to find when needed" (G-06, January 22, 2026). Qualitatively, information systems provide a significant impact on improving the quality and performance of school administration.

***The Effect of Digitalization on the Optimization of Educational Governance***

Table 4. Results of the Analysis of Digitalization on Educational Governance

Variable	Regression Coefficient	t-value	Sig.
Digitalization Based on Information Systems	0.671	4.890	0.000

The analysis results indicate that administrative digitalization based on information systems has a positive and significant effect on the optimization of educational governance. The coefficient value of 0.671 shows that digitalization contributes significantly to improving transparency, accountability, and effectiveness in educational governance. This indicates that the integration of technology in school administration is a key factor in enhancing governance quality. Thus, hypothesis H4 is accepted.

Qualitative findings further strengthen that digitalization impacts not only technical aspects but also the overall quality of governance. Informants stated that digital systems make monitoring and evaluation processes easier. The interview excerpts are as follows: As stated by the principal: "Now everything can be monitored, so it's more transparent, nothing is hidden anymore" (K-01, January 25, 2026). Then the school operator added: "This system makes work clearer, who does what is all visible" (O-04, January 27, 2026). Qualitatively, digitalization has proven to improve governance quality through better transparency and accountability.

The findings of this study demonstrate that educational governance significantly improves the quality of school administration, confirming that governance functions as a structural foundation for effective administrative practices. The statistical results indicate a strong positive relationship, which implies that governance mechanisms such as transparency, accountability, and structured decision-making directly influence administrative performance. This finding is consistent with the concept of institutional governance theory, which emphasizes that organizational effectiveness depends on the alignment between management systems and information structures (Ansell & Torfing, 2021). Furthermore, the integration of digital systems enhances governance by enabling real-time monitoring and data-driven decision-making processes. Previous research by Sørensen and Torfing (2022) also highlighted that collaborative governance supported by digital platforms improves public sector performance. However, this study extends prior findings by specifically examining governance at the school level and linking it directly with administrative digitalization. In the

Indonesian context, similar patterns were identified by Sari and Prasetyo (2024), although their study did not explicitly connect governance with system-based administration. Thus, the novelty of this research lies in demonstrating how governance effectiveness is operationalized through digital administrative systems in educational institutions.

The results further reveal that the digitalization of school administration significantly enhances efficiency and effectiveness, particularly in reducing manual workloads and improving the speed of administrative processes. This aligns with the digital transformation framework, which states that digital technologies streamline organizational workflows and improve operational outcomes (Verhoef et al., 2021). The improvement in efficiency observed in this study is reflected in faster data processing, improved reporting systems, and reduced redundancy in administrative tasks. Similar findings were reported by Bondarouk, Parry, and Furtmueller (2020), who argued that digitalization improves organizational productivity by optimizing internal processes. In Indonesia, empirical evidence from Nugraha and Widiyanto (2023) also confirms that digital systems in schools contribute to administrative efficiency, although implementation challenges persist. The present study contributes by demonstrating that efficiency gains are not only technical improvements but also indicators of broader governance enhancement. Therefore, the novelty lies in positioning efficiency as both an operational outcome and a governance indicator.

Moreover, the significant influence of information systems on administrative performance highlights the importance of system quality and user engagement in achieving organizational effectiveness. This finding is supported by the Information Systems Continuance Model, which explains that sustained use of information systems depends on perceived usefulness and system reliability (Bhattacharjee, 2020). The results indicate that well-integrated systems improve data accuracy, accessibility, and administrative service quality. Previous international studies by Tam and Oliveira (2021) also found that system quality directly influences user satisfaction and organizational performance. In the Indonesian context, research by Hidayati and Kurniawan (2024) suggests that school information systems enhance administrative transparency but require adequate training and infrastructure. This study extends these findings by integrating quantitative evidence with qualitative insights, showing how system effectiveness translates into improved governance outcomes. Thus, the contribution of this research lies in linking system performance with governance quality in a comprehensive analytical model.

In addition, the study confirms that digitalization based on information systems significantly contributes to the optimization of educational governance. This finding is aligned with the concept of digital-era governance, which emphasizes the role of technology in transforming public sector management through integration, automation, and citizen-centered services (Margetts & Dunleavy, 2020). The ability of digital systems to enhance transparency and accountability is evident in the improved monitoring and evaluation processes within schools. Previous studies by Criado, Guevara-Gómez, and Villodre (2021)

indicate that digital governance improves institutional performance through enhanced data utilization. However, most of these studies focus on governmental institutions, whereas this research provides empirical evidence at the school level. In Indonesia, research by Putri and Santoso (2022) highlights that digital governance in education is still developing and faces challenges in implementation. This study differs by providing empirical confirmation that digitalization directly impacts governance optimization, particularly in administrative contexts. Therefore, the novelty lies in bridging macro-level governance theory with micro-level school practices.

Despite these positive findings, the study also identifies several factors that influence the effectiveness of digitalization, including digital literacy, infrastructure availability, and organizational readiness. These factors explain why the impact of digitalization is not uniform across all respondents and institutions. The findings suggest that while digital systems improve efficiency and governance, their effectiveness depends on the capacity of users and institutional support systems. This is consistent with the findings of Schou and Hjelholt (2021), who argue that digital transformation outcomes are shaped by socio-technical factors rather than technology alone. In Indonesia, similar challenges were reported by Ramadhan and Wibowo (2023), who identified infrastructure limitations and human resource constraints as key barriers to digital implementation in schools. The logical implication is that digitalization must be accompanied by capacity-building initiatives and infrastructure development to achieve optimal results. Therefore, this study contributes by highlighting that successful governance optimization requires not only technological adoption but also organizational readiness and human resource development.

## **CONCLUSIONS AND RECOMMENDATIONS**

This study concludes that the digitalization of school administration based on information systems significantly improves administrative efficiency, accuracy, and transparency, which in turn strengthens educational governance at the school level. The integration of digital systems enables more structured workflows, data-driven decision-making, and enhanced accountability, although challenges related to digital literacy and infrastructure remain. Therefore, it is recommended that schools strengthen capacity building for human resources, improve technological infrastructure, and ensure continuous system integration to achieve sustainable governance optimization.

## **ADVANCED RESEARCH**

Future research is recommended to expand the scope by involving multiple schools or regions and applying more advanced analytical models such as SEM or longitudinal studies to examine the long-term impact of digital governance in education.

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