Journal of Educational Sciences
Journal homepage: https://jes.ejournal.unri.ac.id/index.php/JES

P-ISSN 2581-1657
E-ISSN 2581-2203

Effectiveness of Using School Management Information Systems to Improve Principal Performance

Siti Wasiatun Nikmah*, Rasiman, Qristin Violinda
Magister Pendidikan Pascasarjana, Universitas Persatuan Guru Republik Indonesia, Semarang, 50237, Indonesia

ARTICLE INFO

Article history:

Received: 17 Sept 2025
Revised: 13 Oct 2025
Accepted: 25 Oct 2025
Published online: 05 Nov 2025

Keywords:

Management Information System,
Principal Performance,
Effectiveness

* *Corresponding author:*

E-mail: nikmahiah@gmail.com

Article Doi:

https://doi.org/10.31258/jes.9.6.p.5141-5150

This is an open access article under the CC BY-SA license.

A B S T R A C T

As leaders in educational units, principals play an important role in the development of educational information systems in schools. This study aims to determine the effectiveness of using school management information systems to improve principal performance. The method used is Research and Development (R&D) with a Mixed Methods approach, combining quantitative and qualitative analysis. The development follows the ADDIE model through five stages: (1) analysis of potential and problems, (2) system design, (3) development, (4) testing, and (5) evaluation. Data were obtained through observation, interviews, expert validation questionnaires (material, media, and design), as well as limited trials and field tests in experimental and control schools. The results of the study indicate that the use of this system is very feasible, practical, and effective in improving the performance of school principals.

1. Introduction

The global digital world is growing rapidly in the era of the 4.0 industrial revolution. Technology is no longer just a tool but has been integrated into people's daily lives. Schools, as educational institutions, play a crucial role in the use of technology, especially in the fields of information and services. The importance of developing management information systems in educational institutions cannot be ignored. With a good management information system, schools can optimize the management of various aspects of education, such as school administration, learning processes, and data on educators and educational staff, students, and parents more efficiently (Hansen, 2020).

The principal emphasized that the school management information system (SIMS) is a vital element in improving data management effectiveness, information

transparency, and data-driven decision making. The manual system that has been used so far has proven to have many weaknesses, such as being inefficient, prone to data loss, and difficult to access quickly. A study conducted by (Rahmawati, 2023) shows that the application of cloud-based technology in school administration can increase work efficiency by up to 40%. Meanwhile, research by Nugroho (2022) confirms that the use of digital platforms in education management can improve transparency and accountability. However, these studies are still limited to school management systems in general and are not yet specific.

Effectiveness comes from the word "effective," which means achieving the desired results using the right methods and timing. According to Gibson (2000), effectiveness is the degree of success of an organization in achieving its established goals. Meanwhile, Siagian (2001) states that effectiveness is a measure of how far the organization has achieved its targets (in terms of quality, quantity, and time). Thus, effectiveness refers to the ability of an individual, group, or institution to complete tasks in accordance with expectations and objectives.

Information systems are the basis for managing and utilizing information effectively in supporting decision-making, control, and operations in an organization. Information systems play a role in supporting various organizational activities, thereby increasing efficiency, accuracy, and competitiveness. In its application, information systems cover the processes of planning, development, implementation, operations, and maintenance (Erkamim, 2017). With the introduction of a new learning environment at the beginning of the 21st century, individual and community responsibilities have increased, along with the growing need for education Sardiyanah, (2020). A system can be defined as a network of interrelated procedures that work together to carry out an activity or achieve a specific goal (Mulyati, 2017).

Management Information Systems (MIS) themselves, according to (Sari, 2021), are internal controls in a business that involve people, documents, technology, and procedures to solve problems such as product costs, services, or business strategies. (Pamungkas et al., 2020) adds that MIS is a system that provides information in the form of reports and images used by managers and professionals, for example, for sales analysis, production performance, or cost reporting. MIS aims to support a group of managers representing specific organizational units, either based on management level or functional area. From this explanation, it can be concluded that this system is an information-based technology that securely stores educational data and allows for the reuse of that data. This innovation not only improves the efficiency of the principal's tasks but also creates a more collaborative and transparent work environment.

School principals play a key role in improving school progress, responsible for ensuring that the information systems used can help improve the efficiency and effectiveness of administration, teaching, and learning. It is stated (Erlena, 2022) that school principals have a big responsibility in managing various operational and academic aspects, including managerial, administrative, and supervisory tasks for teachers and educational staff. Therefore, the principal has the responsibility to

instill, develop, and improve at least four main aspects, namely mental, moral, physical, and artistic development. Meanwhile, (Hidayat, 2023) emphasizes that as educators, principals have a role in designing, implementing, and evaluating the learning process, as do teachers. According to (Rapang, 2022), principals are responsible for implementing educational activities, school administration, coaching other educational staff, and utilizing and maintaining facilities and infrastructure.

This study is expected to contribute to the development of literature in the field of educational technology and digital-based school management. In practical terms, the results of this study can be used as a reference for elementary schools in adopting more effective digital solutions to improve the efficiency of school administration and management. School principals believe that digitization is a strategic step towards creating schools that are modern, innovative, and adaptive to the changing times.

2. Methodology

The type of research in this study is research and development. Development research is necessary research in which development aims to develop products, test product benefits, and assess the effectiveness and efficiency of the developed products. Development research is research that produces something new to be applied in elementary schools. According to (Waruwu, 2021) Research and Development is a research method that is widely adopted in today's academic world to design and test the effectiveness of products. The research and development method aims to produce a specific product through a process of discovering potential and problems, designing and developing a product as a solution to the problem.

According to Sugiyono (2019) in (Tanzeh, 2004), research methods are scientific actions carried out to obtain data used for specific purposes. In processing research data, various approaches are used as ways of viewing the results of the experiments conducted. This study uses a quantitative research approach, where data processing is carried out using quantitative methods. Quantitative methods are research methods that involve statistical or numerical data analysis (Sugiyono, 2019). The data obtained in this study was tested using statistical formulas, the results of which were in the form of numbers that showed the results of the research that had been carried out.

The research design applied by the researcher in this proposal is part of Research and Development (R&D). According to (Waruwu, 2023), research and development aims to design solutions to problems in research by creating a product based on the results of needs analysis, which is then tested and evaluated for improvement. The research was conducted using the ADDIE development research model.

According to (Arikunto, 2006), if the population is less than 100 people, the sample size is taken as a whole, but if the population is greater than 100 people, 10%-15% or 20%-25% of the population can be taken. This study used the Non-Probability Sampling method with a saturated sampling technique. According to Sugiyono (2016), Non-Probability Sampling is a sampling technique that does not give equal opportunities or chances for each element or member of the population to become a sample. Questionnaires are used to conduct surveys and final assessments during the activity process. Questionnaires According to Arikunto (2012) in (Prestasi, 2014), a questionnaire is a list of questions that must be filled out by the person being measured (respondent), with the aim of finding out their circumstances/personal data, experiences, knowledge, attitudes, and opinions.

Table 1. Effectiveness Test Sheet

No	Question	Measured Aspects	Indicator	Variabel	Types of Instruments
1	Digital management information systems are necessary to improve the effectiveness of principals' tasks.	User needs for digital SIM applications	Perception of the importance of applications to support the principal's duties	Effectiveness of SIM Applications	Questionnaire (Likert scale)
2	Digital management information system application	Availability of information systems	The existence and availability of digital SIM applications in schools	Utilization of Information Technology in Schools	Questionnaire (Likert scale)
3	How much do you know about digital management information system applications?	User knowledge	Level of understanding of the features, functions, and purposes of the application	Level of Digital Literacy	Questionnaire (Likert scale)
4	The use of digital MIS applications is more effective than manual systems.	Efficiency of technology use	Comparison between the use of digital systems and manual systems	Work Effectiveness	Questionnaire (Likert scale)
5	Teachers have introduced how to use digital MIS applications so that they are easy to understand.	Education on application use	Frequency or experience of training/introduction to the application by teachers	Teacher Support for Technology Implementation	Questionnaire (Likert scale)
6	Digital MIS applications are easier to use than manual ones.	Ease of use of the system	Perception of the interface, navigation, and user experience	User-Friendly SIM Applications	Questionnaire (Likert scale)

No	Question	Measured Aspects	Indicator	Variabel	Types of Instruments
7	Digital MIS applications make it easier to receive and share documents from the principal.	Digital collaboration and communication	Ease of document exchange through digital systems	Effectiveness of Digital Communication and Collaboration	Questionnaire (Likert scale)
8	Digital MIS applications adapt to developments in z	Technology adaptability	The suitability of the application to current needs and the latest technology	Suitability of Applications for the Digital Age	Questionnaire (Likert scale)

The type of instrument used was a questionnaire with a Likert scale. (1–4):
1 = Strongly disagree
2 = Disagree
3 = Agree
4 = Strongly agree

After calculating the percentage, the criteria for the presentation were determined, and the validation criteria for the developed product were presented.

The classification of media percentage results can be converted in the following table:

Table 2. Media Suitability Classification

Interval	Criteria
0%-25%	Very inappropriate
25%-50%	Inappropriate
51%-75%	Adequate
76%-100%	Appropriate

Analysis of responses from students, teachers, and principals was used to determine the responses of students and teachers to the developed product. Feasibility testing used descriptive data, which is the conversion of quantitative data into qualitative data. (Arikunto, 2009) explains that validity is a measure that indicates the levels of validity, authenticity, and effectiveness of an instrument. Analysis of respondent responses is used to test the level of validity, whether the use of a management information system application with Linktree and Google Workspace integration is valid for improving the effectiveness of principal performance.

Based on a questionnaire distributed to principals regarding the use of digital applications. There are eight aspects related to the application of digital management information systems in supporting the effectiveness of principals' tasks, and principals responded positively to the use of these applications. Seven of the eight aspects showed principals' enthusiasm for the use of digital technology, indicating that the use of digital information systems plays a significant role in supporting the overall performance of principals.

3. Result and Discussion

Analysis

Based on the results of interviews with school principals, information systems in schools are still managed manually due to limitations in technological infrastructure and human resources. All administrative data, such as student, personnel, financial, and teaching and learning activities, are still recorded physically. School principals also said that the use of manual information systems has advantages and disadvantages. The advantage of using a manual information system is that it does not depend on the internet or technological devices, so it can still run in limited conditions. This system is also considered easier for educators who are not familiar with technology. Meanwhile, the disadvantages of using a manual information system are that the data processing is slow, files are prone to loss or damage, and reporting to the education office is inefficient. The transition to a digital system is considered necessary, but it must be done gradually with assistance.

Table 2. Results of School Principals' Needs for Information Management System Applications

Aspects assessed	Answer	Options
1. Is a digital management information system application necessary to improve the effectiveness of a principal's duties?	Yes No Other answer	✓
2. Is the use of a digital management information system application more effective than the use of a manual information system?	Yes No Other answer	✓
3. Is a digital management information system application easier to use for receiving and sharing documents from the principal through the application?	Yes No Other answer	✓
4. Does this digital management information system application with Linktree and Google Workspace integration facilitate collaboration and speed up administrative work?	Yes No Other answer	✓
5. Does a digital management information system application support the performance of school principals?	Yes No Other answer	✓
6. Are digital management information system applications widely available and can they be developed extensively?	Yes No Other answer	✓
7. Is a developed digital management information system application easier to use than a manual information system?	Yes No Other answer	✓
8. Does a developed digital management information system application adapt to the times?	Yes No Other answer	✓

The survey results show that principals need technical training to optimize the use of digital management information system applications. This is important because principals' perceptions of the ease and relevance of digital applications are quite

high. Regular evaluation of the effectiveness of the application is also important so that the system remains adaptive to the dynamics of the principal's duties.

Design

The product design was obtained based on interviews analyzing the needs of school principals. The results of the analysis were used as considerations in designing a prototype information management system application for the effectiveness of the principal's duties. In addition, this application is also equipped with features that make it easier for principals to obtain school information simply by using their mobile phones from home. Each element in the application is designed with consideration given to its effectiveness in improving the performance of the principal.

Development

This process includes refining illustrations, more attractive coloring, easy-to-read text layout, and integration of interactive elements in the application section to support the effectiveness of the principal's performance.

Table 3. Results of Media Experts' Assessment of Cover Aspects

Aspect	Indicator	Media Expert Score	Criteria
User character compatibility	System interface	4	Very Good
	Features	4	Good
	Complexity	3	Very Good
	Digital literacy	4	Very Good
Total score obtained		15	
Maximum score		16	
P%		93,75%,	
Description		Highly recommended	

Based on the results of a questionnaire assessment by media experts on the appearance of the management information system application for the effectiveness of the principal's performance, the following results were obtained: The system interface is in line with the needs of school principals, scoring 4 with a rating of excellent. The features provided are relevant to managerial tasks, scoring 4 with a rating of excellent. The level of system complexity is in line with user capabilities, scoring 3 with a rating of good. The system accommodates various levels of user digital literacy, scoring 4 with a rating of excellent. The total score obtained was 15 out of a maximum score of 16, with a feasibility percentage of 93.75%, which falls into the “very feasible” category. This shows that the management information system application meets good quality standards in terms of language, readability, and material suitability, thereby improving the performance effectiveness of school principals.

Implementation

The results of the trial were used as a basis for revisions or improvements before proceeding to a more extensive trial phase.

Table 4. Limited Scale Trial Results

No	Indicator	Principal	
		Pre test	*Post Test*
1.	Ease of obtaining data at school	4	4
2.	Digital information system applications	2	4
3.	Knowledge of digital SIM applications	2	4
4.	Transparency of information	2	4
5.	Education by teachers	3	4
6	Ease of digital applications compared to manual ones	3	4
7.	Storage security	2	4
8.	Adaptation to the times	2	4
Score		20	32
Increase (%)		60%	

Based on the data processing results, the principal obtained a pretest score of 20 and increased to 32 on the posttest. This shows an increase of 60%. This increase indicates that the principal has made significant progress in terms of understanding the ease of obtaining data, utilizing digital SIM applications, and recognizing the security and suitability of the system in line with the times. It can be concluded that all respondent groups showed an increase in understanding and a positive attitude towards the use of digital SIM applications.

Evaluation

A large-scale trial was conducted as a follow-up to the development of a digital Management Information System (MIS) application that had previously undergone limited trials. The purpose of this large-scale trial was to determine the effectiveness, ease of use, and overall impact of the application on improving the quality of information services in schools, particularly in supporting the effectiveness of the principal's duties. The difference in average improvement between the management information system application in the experimental class and conventional learning in the control class can be seen in the following graph:

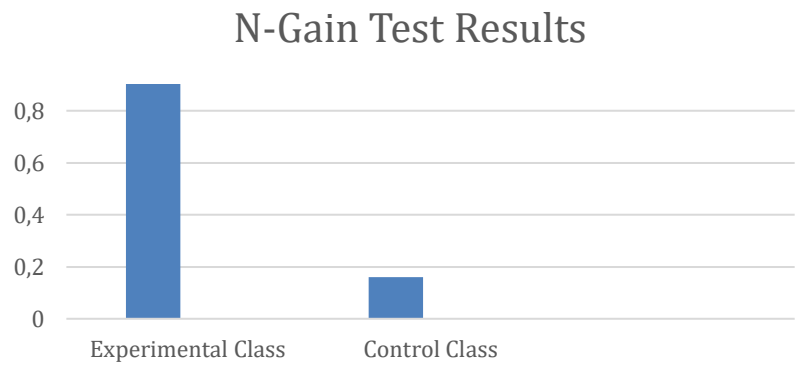

Figure 1. Increase in Average Large-Scale Trial

Based on the diagram above, it can be concluded that there is a difference in the results of the increase in the efficiency of the principal's tasks between the control class and the experimental class. The experimental class showed an N-Gain value of 0.92 in the high category, while the control class had an N-Gain value of 0.16 in the low category. The higher N-Gain value in the experimental class indicates that the use of digital applications or interventions implemented in the experimental class with the implementation of a management information system application is more effective in improving the efficiency of the principal's tasks. Based on these results, it can be concluded that the Management Information System application is very practical for improving the effectiveness of the principal's performance with an average score of 92.98%.

4. Conclusion

The management information system is declared valid based on the assessment results of subject matter experts, media experts, and design experts. All indicators of content, appearance, and functionality meet the established criteria, making this system suitable for use in supporting the principal's managerial, supervisory, and administrative tasks. This validity ensures that the content, features, and cross-platform integration are in line with the real needs of principals in elementary schools. The effectiveness of the system is proven by the significant increase between the pretest and posttest scores in the experimental class. This difference shows that the system is capable of improving the efficiency of principals' work, speeding up reporting, improving the neatness of administration, and facilitating supervision and internal communication.

References

Arikunto. (2006). Arikunto, Suharsimi. (2006). Prosedur Penelitian: Suatu Pendekatan Praktik. Jakarta: Rineka Cipta. *Rineka Cipta.*, *13*(2).

Erkamim, M. (2017). Buku Ajar Pengantar Sistem Informasi. In *Universitas Nusantara PGRI Kediri* (Vol. 01).

Erlena, E. (2022). Peran Kepemimpinan Kepala Sekolah Dalam Meningkatkan Mutu Pendidikan. *Jurnal Manajemen Pendidikan Al Hadi*, *2*(2). https://doi.org/10.31602/jmpd.v2i2.7340

Gibson, J. L. Ivancevich dan Donnelly, 2000. *Organisasi Perilaku, Struktur*.

Hansen, S. (2020). Investigasi Teknik Wawancara dalam Penelitian Kualitatif Manajemen Konstruksi. *Jurnal Teknik Sipil, 27(3).* https://doi.org/10.5614/jts.2020.27.3.10

Hidayat, S., Rozak, A., & Renanda Saputra, W. (2023). Peran Kepala Sekolah dalam Meningkatkan Mutu Pendidikan Sekolah. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, *6*(9). https://doi.org/10.54371/jiip.v6i9.2718

Mulyati, Y. S. (2017). KONSEP SISTEM INFORMASI. *Jurnal Administrasi Pendidikan*, *3*(1). https://doi.org/10.17509/jap.v3i1.6095

Nugroho, H. I., & Sunarto, S. (2022). Supervisi Kepala Sekolah Memoderasi Pengaruh Asertif Dan Kompetensi Guru Terhadap Manajemen Kelas (Studi Kasus Di Smk Negeri Di Kabupaten Batang Jawa Tengah). *YUME: Journal of Management*, *5*(3).

Pamungkas, I. B., Putranto, A. T., Pratama, A., Syah, A., & Nurdina, A. (2020). Membangun Perekonomiandi Lingkungan Masyarakat. *Dedikasi Pkm*, *1*(2). https://doi.org/10.32493/dedikasipkm.v1i2.6385

Prestasi, M., & Akuntansi, P. B. (2014). Arikunto, Suharsimi. 2012. Dasar-Dasar Evaluasi Pendidikan. Jakarta: Bumi Aksara. *Universitas (Stuttg)*, *137*.

Rahmawati, H., Cahyani, I., Santoso, B., & Ramadhan Aulia, R. (2023). Inovasi Media Pembelajaran Bahasa Inggris Menggunakan Aplikasi Mobile Learning Berbasis Android "English For Computer Students" (MOLEFOCS) Untuk Mata Kuliah Bahasa Inggris Di STIMIK Tunas Bangsa Banjarnegara. *Smart Comp: Jurnalnya Orang Pintar Komputer*, *12*(1). https://doi.org/10.30591/smartcomp.v12i1.4609

Rapang, R., Yunus, M., & Apriyanti, E. (2022). Peran Kepala Sekolah dalam menerapkan Peraturan-Peraturan di Sekolah Dasar. *Edukatif : Jurnal Ilmu Pendidikan*, *4*(3). https://doi.org/10.31004/edukatif.v4i3.2596

Sardiyanah, S. (2020). Lingkungan Pembelajaran Yang Efektif. *Al-Qalam: Jurnal Kajian Islam Dan Pendidikan*, *6*(2). https://doi.org/10.47435/al-qalam.v6i2.173

Sari, I. K. (2021). Blended Learning sebagai Alternatif Model Pembelajaran Inovatif di Masa Post-Pandemi di Sekolah Dasar. *Jurnal Basicedu*, *5*(4). https://doi.org/10.31004/basicedu.v5i4.1137

Siagian, P. 2001. Organisasi dan Prilaku Administrasi. Jakarta.Gunung Agung.

Sugiyono. (2016). Sugiyono, 2016. In *Journal of Chemical Information and Modeling* (Vol. 53, Issue 9).

Sugiyono. (2019). Sugiyono 2018:8 metode kuantitatif. *Sugiyono, 2018:267*, *53*(9).

Tanzeh, A., & Arikunto, S. (2004). Metode Penelitian Sugiyono 2019. *Metode Penelitian*.

Waruwu. (2023). Efektivitas Metode Pembelajaran Menggunakan TIK Dalam Meningkatkan Kualitas Pendidikan Agama Kristen. *Jurnal Teologi Injili Dan Pendidikan Agama*, *1*(1).

Waruwu, M., & Nuryani, L. K. (2021). Studi Kasus Penerapan Prinsip Akuntabilitas pada Pengelolaan Sekolah Dasar. *Jurnal Basicedu*, *5*(5). https://doi.org/10.31004/basicedu.v5i5.1336

How to cite this article:

Nikmah, S. W., Rasiman., & Violinda, Q. (2025). Effectiveness of Using School Management Information Systems to Improve Principal Performance. *Journal of Educational Sciences*, *9(6)*, 5141-5150.