

Efficiency of Automated School Management System: Basis for Intervention

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ABSTRACT

This study evaluated the perceived efficiency of an Automated School Management System (ASMS) implemented in a local college in the Negros Island Region as a basis for developing an intervention program. Guided by the Technology Acceptance Model, Information Systems Success Model, and General Systems Theory, the study assessed perceived system efficiency in terms of system quality, information quality, service quality, usability, reliability, and accessibility. A quantitative descriptive-comparative research design was employed with 200 respondents comprising full-time permanent and contractual faculty members, enrolling officers, program heads, deans, personnel from the Office of the Vice President for Academic Affairs, and Registrar's Office personnel. Data were gathered using a researcher-adapted survey questionnaire and analyzed using descriptive and inferential statistics. The findings showed that the ASMS was perceived as efficient overall, with usability receiving the highest rating and system quality the lowest. No significant differences in perceived system efficiency were found when respondents were grouped according to respondent category and length of system utilization. The findings provide a basis for targeted improvements in system quality, information quality, service quality, usability, reliability, and accessibility.

Keywords: Automated School Management System, system efficiency, information quality, usability, reliability

INTRODUCTION

This chapter outlines the foundational background of the study, establishes underlying theoretical and conceptual paradigms alongside the primary research problem and corresponding statistical hypotheses. Furthermore, it highlights the study's investigative scope and delimitations, practical significance, and conceptual and operational definitions of relevant terminologies.

Background of the Study

The increasing use of digital information systems has changed how higher education institutions manage academic and administrative processes. Automated School Management Systems (ASMS) integrate functions such as enrollment, records management, grading, scheduling, and reporting into a centralized platform. However, the presence of a digital system does not by itself establish that the system performs effectively. Its value depends on the quality of the system, the information it produces, the support provided to users, and the ease, reliability, and accessibility of its operation.

The assessment of information systems therefore requires attention to specific dimensions of performance. The Information Systems Success Model identifies system quality, information quality, and service quality as central dimensions of information system success, while usability, reliability, and accessibility provide additional perspectives relevant to users' interaction with an institutional system. These dimensions address different aspects of system performance: system quality concerns functionality and technical performance; information quality concerns the accuracy, completeness, relevance, and timeliness of generated information; service quality concerns technical assistance and user support; usability concerns ease of learning and

operation; reliability concerns consistent and dependable performance; and accessibility concerns the availability and convenience of system access.

In the local college examined in this study, the ASMS is used by faculty members and administrative personnel in performing academic and institutional transactions. The system therefore serves users with different responsibilities and levels of interaction. Evaluating the system from the perspectives of these actual users can identify areas in which its performance is perceived as satisfactory and areas requiring improvement.

Despite the increasing use of digital management systems in higher education, limited empirical evidence is available regarding the perceived efficiency of the specific ASMS implemented in the participating local college in the Negros Island Region. Existing studies have generally examined educational information systems, student information systems, and technology acceptance in broader settings. The present study addresses this gap by focusing specifically on the ASMS used by the participating institution and by examining its perceived efficiency across six dimensions: system quality, information quality, service quality, usability, reliability, and accessibility.

Accordingly, this study evaluated the perceived efficiency of the ASMS and determined whether perceptions differed according to respondent category and length of system utilization. The findings are intended to provide institution-specific evidence that can guide the development of an intervention program addressing identified areas for system improvement.

Conceptual Framework

This study investigated the relationship between the independent variable, respondents' profile, and the dependent variable, efficiency of the automated school management system, among the system's key stakeholders in a local college in the Negros Island Region. The conceptual framework illustrated how variations in respondents' characteristics may influence their assessment of the system's efficiency and how the findings will serve as the basis for developing an appropriate intervention program. It provided the structural foundation for analyzing the association between the profile variables and the different dimensions of system efficiency.

The independent variable was the respondents' profile, which consists of two demographic indicators. The first was the respondent category, referring to the specific stakeholder group utilizing the automated school management system, namely faculty members, enrolling officers, program heads, deans, personnel from the Office of the Vice President for Academic Affairs, and personnel from the Registrar's Office. The second was the length of system utilization, which pertains to the duration of respondents' experience in using the system, classified as less than one year, one to two years, three to four years, and five years or more. These profile variables were expected to reflect differences in system exposure and user experience that may influence perceptions of system efficiency.

The dependent variable was the perceived efficiency of the Automated School Management System, operationalized as the respondents' overall assessment of the system's performance in supporting academic and administrative transactions. In this study, perceived efficiency was measured through six dimensions: system quality, information quality, service quality, usability, reliability, and accessibility. These dimensions represent distinct but complementary aspects of system performance. System quality refers to the functionality, responsiveness, stability, and technical performance of the system. Information quality refers to the accuracy, completeness, relevance, and timeliness of information generated by the system. Service quality refers to the adequacy and responsiveness of technical assistance and support services. Usability refers to the ease with which users can learn, navigate, and operate the system. Reliability refers to the system's consistency and dependability in performing its intended functions. Accessibility refers to the convenience and availability of system access for authorized users.

For purposes of this study, these six dimensions are treated as indicators used to determine the overall perceived efficiency of the ASMS rather than as separate dependent variables. Thus, the overall efficiency

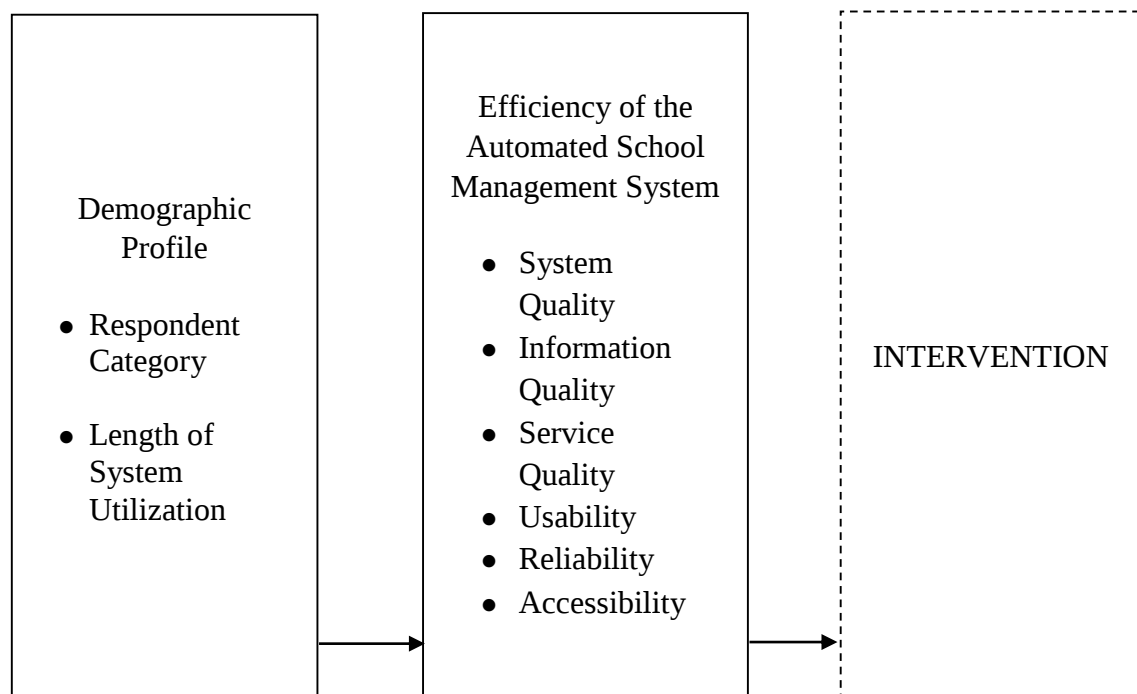
rating represents the respondents' aggregated perception of how effectively the system performs across these dimensions.

Within the framework, directional arrows symbolically connected the respondents' profile to the efficiency dimensions of the automated school management system, indicating that differences in stakeholder category and length of system utilization may influence users' evaluations of system performance. The framework likewise recognized that the six dimensions of efficiency collectively represent the overall effectiveness of the automated school management system in facilitating academic and administrative processes within the institution.

The findings of the study would provide empirical evidence regarding the strengths and areas for improvement of the automated school management system. Based on the results, a proposed intervention program would be developed to enhance system quality, improve information and service delivery, strengthen usability and reliability, and increase system accessibility. The proposed intervention was expected to support institutional decision-making, promote continuous system enhancement, and improve the quality of digital services provided to all stakeholders.

The figure below presented the symbolic representation of the interrelationship among the respondents' profiles, the efficiency dimensions of the automated school management system, and the proposed intervention derived from the findings of the study.

Figure 1. Schematic Diagram of the Study



Statement of the Problem

This study aimed to evaluate the efficiency of the automated school management system implemented in a local college in the Negros Island Region as the basis for the development of an evidence-based intervention program.

Specifically, it sought to answer the following questions:

What is the profile of the respondents in terms of:

- respondent category; and

- length of system utilization?

What is the level of efficiency of the Automated School Management System as a whole and in terms of:

- system quality;
- information quality;
- service quality;
- usability;
- reliability; and
- accessibility?

Is there a significant difference in the efficiency of the automated school management system when grouped according to respondents' profiles?

Hypothesis of the Study

This study addressed the following null hypothesis:

There is no significant difference in the efficiency of the automated school management system when grouped according to respondents' profiles.

Significance of the Study

The findings of this study can offer valuable insights that may support institutional improvement and technology-driven decision-making among various stakeholders:

College Administration. The findings may enable administrators to assess the operational strengths and limitations of the Automated School Management System. They can serve as a basis for policy formulation, strategic planning, and the continuous enhancement of digital governance initiatives.

Information Technology Personnel. The study may assist information technology personnel in identifying technical deficiencies and system improvement priorities. The results can support initiatives aimed at strengthening system reliability, accessibility, performance, and user support services.

Academic Offices. The findings may assist academic offices in evaluating existing operational procedures and identifying opportunities for process optimization. They can support the delivery of timely, accurate, and efficient administrative services across key academic units.

Faculty Members. The findings may contribute to the enhancement of instructional and administrative functions by improving system usability. They can facilitate more efficient management of grading, scheduling, records, and other academic responsibilities.

Students. The study may promote a more accessible and efficient delivery of academic services through an enhanced management system. The improvements can provide students with streamlined enrollment processes, accurate academic records, and more effective institutional communication.

Future Researchers. The study may serve as a scholarly reference for future investigations involving educational information systems and digital transformation in higher education. It can also provide a conceptual and methodological foundation for related studies in school management technologies and institutional innovation.

Scope and Limitations of the Study

This study solely focused on determining the efficiency of the automated school management system implemented in a local college in the Negros Island Region during the academic year 2025 – 2026.

Specifically, the investigation concentrated on the dimensions of system quality, information quality, service quality, usability, reliability, and accessibility as perceived by its end users.

The respondents were limited to full-time permanent and full-time contractual faculty members, enrollment personnel, program heads, deans, staff from the Office of the Vice President for Academic Affairs, and personnel from the Registrar's Office who regularly utilize the system.

The study was confined to measuring users' perceptions of the system's efficiency and did not encompass technical examinations of software architecture, source code, cybersecurity mechanisms, or financial feasibility. Likewise, it excluded comparative analyses with other school management systems, and its findings were limited to the responses obtained during the conduct of the study.

Definition of Terms

To facilitate the understanding of this study, significant terms were defined conceptually and operationally:

Accessibility. Conceptually, accessibility refers to the extent to which an information system can be conveniently accessed and effectively used by its intended users across various devices, environments, and user conditions. It promotes inclusive access by minimizing barriers to system use (International Organization for Standardization [ISO], 2024).

Operationally, accessibility refers to the degree to which the Automated School Management System is readily available and easy to access by students and institutional personnel whenever needed. It is measured based on the respondents' perceptions of the system's availability and ease of access.

Automated School Management System. Conceptually, an automated school management system is an integrated information system designed to streamline academic and administrative processes by automating data management, communication, and institutional transactions through digital technologies (Laudon & Laudon, 2022).

In this study, the Automated School Management System refers to the digital platform utilized by the local college to facilitate enrollment, records management, grading, scheduling, and other academic and administrative functions. Its efficiency serves as the primary subject of assessment.

Efficiency. Conceptually, efficiency in an information system denotes the ability of the system to perform its intended functions accurately, promptly, and with optimal use of available resources while meeting user expectations and organizational requirements (Stair & Reynolds, 2021).

Operationally, efficiency refers to the overall effectiveness of the Automated School Management System as perceived by its users. It is evaluated through the dimensions of system quality, information quality, service quality, usability, reliability, and accessibility.

Full-Time Faculty. Conceptually, these are academic personnel employed by higher education institutions on a full-time basis to perform teaching, research, extension, and other institutional responsibilities. They may hold either permanent or contractual appointments while carrying regular instructional and institutional workloads (Commission on Higher Education [CHED], 2024).

In this study, full-time faculty refers to all permanent and contractual faculty members employed by the local college who regularly utilize the Automated School Management System in performing instructional and administrative functions. They served as the respondents of the study.

Information Quality. Conceptually, information quality pertains to the accuracy, completeness, relevance, consistency, and timeliness of information generated by an information system for operational and decision-making purposes (Stair & Reynolds, 2021).

For this study, information quality refers to the respondents' assessment of the accuracy, completeness, relevance, and timeliness of the information produced by the Automated School Management System.

Intervention. Conceptually, an intervention is a systematic and evidence-based set of actions or strategies formulated to address identified concerns and improve existing organizational practices or processes (Creswell & Creswell, 2023).

Operationally, intervention refers to the enhancement program that will be developed based on the findings of the assessment to improve the efficiency and functionality of the Automated School Management System.

Length of System Utilization. Conceptually, the length of system utilization refers to the duration during which users have continuously interacted with an information system, providing them with accumulated experience in its operation and performance (Laudon & Laudon, 2022).

In this study, the length of system utilization refers to the period during which respondents have actively used the Automated School Management System and serves as a demographic variable for comparative analysis.

Reliability. Conceptually, it refers to the capability of an information system to perform consistently and accurately over time without unexpected failures or interruptions, thereby ensuring dependable service delivery (Laudon & Laudon, 2022).

Operationally, reliability refers to the consistency and stability of the Automated School Management System in providing accurate outputs and uninterrupted services as perceived by its users.

Respondent Category. Conceptually, the respondent category refers to the classification of research participants according to their institutional roles or affiliations to facilitate comparative analysis among stakeholder groups (Bhattacharjee, 2021).

Within this study, respondent category refers to the classification of participants as students, faculty members, enrollment personnel, program heads, deans, Office of the Vice President for Academic Affairs personnel, or Registrar's Office personnel.

Service Quality. Conceptually, service quality refers to the extent to which technical support and related services meet user expectations through responsiveness, competence, reliability, and effective assistance (O'Brien & Marakas, 2022).

Operationally, service quality refers to the respondents' evaluation of the adequacy, responsiveness, and effectiveness of the technical assistance and support services associated with the Automated School Management System.

System Quality. Conceptually, system quality represents the desirable characteristics of an information system, including functionality, performance efficiency, integration, and operational stability that enable users to accomplish their tasks effectively (Laudon & Laudon, 2022).

In this study, system quality refers to the respondents' assessment of the functionality, responsiveness, stability, and overall performance of the Automated School Management System in supporting institutional operations.

Usability. Conceptually, usability is defined as the extent to which users can effectively, efficiently, and satisfactorily achieve specified goals within a particular context through interaction with a system (International Organization for Standardization [ISO], 2024).

Operationally, usability refers to the degree to which respondents perceive the Automated School Management System as easy to learn, navigate, and operate in carrying out academic and administrative tasks.

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents a critical review of pertinent local and international literature and empirical studies to provide a comprehensive foundation for the present research. The integration of these scholarly sources offers the theoretical and contextual basis essential for understanding and supporting the investigation.

Automated School Management System

The increasing reliance on digital technologies has transformed the administrative landscape of educational institutions, leading to the widespread adoption of Automated School Management Systems (ASMS). These systems integrate academic and administrative functions, including student admission, enrollment, attendance monitoring, grading, scheduling, and financial management, into a centralized platform that supports efficient information processing. According to Grepon et al. (2022), the implementation of an e-school system enables educational institutions to automate complex transactions, reduce dependence on paper-based records, and facilitate timely retrieval of information, thereby improving the quality of administrative services and institutional operations.

Automated School Management Systems are likewise recognized for their capacity to improve organizational efficiency by streamlining routine administrative processes. Through the integration of management information systems, repetitive tasks are executed more accurately and with less manual intervention, allowing administrators and personnel to focus on strategic and academic responsibilities. Damayanto et al. (2025) emphasized that school management automation enhances coordination among stakeholders, optimizes workflow processes, and promotes effective communication across departments, resulting in improved institutional performance and service delivery.

Another significant contribution of automated school management systems lies in strengthening evidence-based decision-making. Educational institutions generate substantial amounts of data related to enrollment, academic achievement, financial operations, and personnel management. When consolidated within a digital platform, these data become valuable resources for planning and policy formulation. Helal et al. (2021) explained that Education Management Information Systems provide administrators with accessible and reliable information that supports resource allocation, performance monitoring, and continuous improvement of teaching and learning processes. The availability of real-time data therefore contributes to more responsive and informed school management.

Recent literature also highlights the role of automated systems in promoting accountability, transparency, and institutional governance. Digital record management minimizes inconsistencies associated with manual documentation while establishing standardized procedures for storing, retrieving, and validating information. Such capabilities improve compliance with organizational policies and facilitate monitoring and evaluation activities. Moreover, automated reporting functions enable administrators to generate accurate institutional reports efficiently, supporting transparency in decision-making and enhancing stakeholder confidence in school operations (Asio et al., 2022).

Despite their documented advantages, the effectiveness of Automated School Management Systems depends largely on the institution's technological readiness and organizational support. Successful implementation requires adequate infrastructure, competent personnel, continuous technical training, and sufficient financial resources. Studies indicate that resistance to technological change, limited digital competencies, and budget constraints may reduce system utilization and limit its potential benefits. Addressing these challenges through strategic planning and capacity-building initiatives is therefore necessary to maximize the effectiveness and sustainability of school automation programs (Damayanto et al., 2025; Grepon et al., 2022).

Collectively, the literature demonstrates that Automated School Management Systems have become indispensable tools for modern educational administration. Their ability to integrate diverse institutional functions into a unified digital environment enhances administrative efficiency, improves information quality, strengthens organizational accountability, and supports data-driven management practices. These scholarly perspectives provide a strong theoretical foundation for the present study, as they affirm that evaluating the

efficiency of an automated school management system can generate empirical evidence for designing appropriate intervention measures that further improve institutional effectiveness and service quality.

Efficiency of Automated School Management System

The efficiency of an Automated School Management System (ASMS) is commonly associated with its capacity to streamline administrative processes, minimize manual workload, and enhance institutional productivity through digital integration. Recent literature emphasizes that information systems improve operational efficiency by centralizing academic and administrative functions, thereby enabling faster processing of records and more effective organizational management. Likewise, digital management platforms promote accountability and resource optimization by reducing redundant procedures and improving access to institutional data. These findings suggest that automation strengthens administrative efficiency while supporting the overall performance of educational institutions (Pradana et al., 2026; Sunarjo et al., 2025; Grepon et al., 2021).

Efficiency gains from automated school management systems are often reflected in improved data management and decision-making processes. Haryanto (2023) observed that management information systems facilitate organized information services, enabling administrators to access accurate and timely data for operational decisions. Similarly, Bhutoria and Aljabri (2022) emphasized that effective management practices supported by digital systems enhance school efficiency through optimal utilization of available resources. The efficiency of automated school management systems also extends to communication and stakeholder engagement. Grepon et al. (2021) noted that centralized information systems improve coordination among administrators, faculty members, and students through faster information dissemination and retrieval. Haryanto (2023) similarly observed that integrated management platforms support effective communication and collaboration within educational institutions. Furthermore, Bhutoria and Aljabri (2022) emphasized that schools employing efficient management practices are better positioned to maximize institutional outputs and improve service quality. Consequently, automated systems contribute not only to operational efficiency but also to stronger organizational connectivity.

Contemporary studies further indicate that automated school management systems contribute significantly to time efficiency and service delivery by replacing paper-based processes with integrated digital workflows. Through automation, routine functions such as enrollment, attendance monitoring, grading, scheduling, and report generation can be completed more accurately and, in less time, allowing school personnel to focus on strategic and instructional responsibilities. The reduction of repetitive administrative tasks also minimizes human error and enhances institutional responsiveness, resulting in improved organizational effectiveness (Rusnati et al., 2021; Redoblo, 2021; Sunarjo et al., 2025).

The efficiency of automated school management systems is likewise reflected in their capacity to support evidence-based decision-making. Integrated databases generate timely and reliable information that administrators can use for planning, monitoring, and policy formulation. Access to real-time institutional data enables school leaders to allocate resources more effectively, monitor operational performance, and identify areas requiring intervention. Consequently, automated systems enhance managerial efficiency by improving the quality and speed of administrative decisions (Pradana et al., 2026; Sunarjo et al., 2025; Forrester, 2019).

Emerging empirical evidence also demonstrates that digital technologies positively influence school operational efficiency when supported by appropriate technological infrastructure and organizational readiness. Institutions with sufficient digital resources, trained personnel, and effective system implementation exhibit higher levels of management efficiency than those relying on conventional administrative practices. The integration of digital platforms fosters coordinated workflows, enhances communication among stakeholders, and strengthens institutional adaptability to changing educational demands (Liu & Kuo, 2021; Kuo, 2021; Grepon et al., 2021).

Despite these advantages, literature recognizes that the efficiency of automated school management systems depends largely on successful implementation and user acceptance. Organizational challenges such as inadequate technical support, insufficient training, resistance to change, and limited infrastructure may reduce

system utilization and operational effectiveness. Addressing these barriers through institutional planning, stakeholder engagement, and continuous capacity-building initiatives is therefore essential to maximize the benefits of digital school management (Alanezi, 2021; Villanueva, 2022; Rusnati et al., 2021).

Overall, the reviewed literature consistently affirms that automated school management systems improve efficiency by optimizing administrative operations, enhancing information management, supporting informed decision-making, and promoting institutional productivity. The effectiveness of these systems, however, is contingent upon technological readiness, organizational commitment, and continuous system enhancement. These scholarly perspectives provide a strong theoretical basis for assessing the efficiency of an Automated School Management System and for developing evidence-based intervention programs aimed at improving school administrative performance.

Efficiency of Automated School Management

System in Terms of System Quality

System quality is widely recognized as a fundamental determinant of the efficiency of automated school management systems because it reflects the system's reliability, usability, responsiveness, and technical performance. According to Çelik and Ayaz (2022), system quality significantly influences the utilization of student information systems by ensuring that users can efficiently perform academic and administrative tasks with minimal technical difficulties. Likewise, Elmunyah et al. (2023) emphasized that a high-quality learning management system promotes operational effectiveness through stable functionality and user-friendly interfaces. Similarly, Umaroh and Barmawi (2021) identified system quality as a critical component of academic information system success, highlighting its role in facilitating seamless institutional processes and improving service delivery. These findings indicate that technically robust systems contribute substantially to organizational efficiency.

Recent studies have demonstrated that system quality enhances institutional productivity by reducing delays and improving transaction processing. Elmunyah et al. (2023) found that system characteristics such as accessibility, response speed, and operational stability strengthen users' perceptions of system effectiveness, thereby supporting continuous utilization. In a similar investigation, Widyaningrum et al. (2024) reported that system quality significantly increases user satisfaction in learning management systems because reliable platforms minimize disruptions and improve learning experiences. Moreover, Marumpe et al. (2025) observed that system quality positively affects both system use and user satisfaction within academic information systems, leading to improved lecturer performance and administrative efficiency. Collectively, these studies underscore the importance of system quality in maximizing the effectiveness of automated educational management platforms.

The reliability and technical functionality of automated school management systems also influence organizational performance by minimizing operational errors. Akrong et al. (2023) explained that system quality encompasses technical adequacy, consistency, and ease of operation, all of which positively affect users and institutional outcomes. Likewise, Iqbal and Rafiq (2023), through their systematic review of the DeLone and McLean Information Systems Success Model, concluded that system quality remains one of the most consistently validated predictors of information system success across public-sector organizations. Furthermore, Ali (2023) reaffirmed that system quality serves as a foundational dimension in evaluating information systems because it directly influences user acceptance and organizational effectiveness. These findings support the view that reliable system architecture enhances the efficiency of automated school management systems.

Efficiency in automated school management systems is likewise associated with system usability and interface design. Çelik and Ayaz (2022) argued that intuitive navigation and functional consistency encourage greater system utilization among students and staff, reducing the time required to complete administrative activities. Similarly, Elmunyah et al. (2023) emphasized that user-friendly system design promotes sustained engagement and operational continuity by eliminating unnecessary complexity. Supporting these findings, Syahrul et al. (2025) reported that high levels of functional suitability, reliability, and usability based on

ISO/IEC 25010 standards contribute significantly to the effectiveness of academic information systems and improve overall user satisfaction. These studies collectively suggest that well-designed systems enhance institutional productivity by simplifying routine operations.

Another important aspect of system quality is its capacity to support continuous institutional operations through dependable performance and integration. Marumpe et al. (2025) found that integrated academic information systems reduce digital fragmentation and improve workflow efficiency by consolidating institutional processes within a single platform. Likewise, Akrong et al. (2023) demonstrated that strong interrelationships among system quality, information quality, and service quality generate positive impacts on user performance and organizational effectiveness. In addition, Widyaningrum et al. (2024) observed that improvements in system quality strengthen user confidence and increase satisfaction, thereby enhancing the overall success of educational information systems. These findings imply that integrated and dependable systems are essential for achieving efficient educational management.

Contemporary literature further suggests that continuous assessment of system quality is necessary to sustain the efficiency of automated school management systems. Syahrul et al. (2025) emphasized that regular evaluation using international software quality standards enables institutions to identify technical weaknesses and improve system performance over time. Similarly, Iqbal and Rafiq (2023) highlighted that evaluating system quality provides a strategic basis for enhancing information system success and organizational outcomes. Moreover, Elmunsyah et al. (2023) concluded that maintaining high system quality strengthens user trust, encourages consistent system use, and supports institutional innovation. Taken together, these studies establish that system quality is an indispensable dimension of efficient automated school management systems and should be continuously monitored to ensure sustainable educational service delivery.

Efficiency of Automated School Management

System in Terms of Information Quality

Information quality is a critical dimension of an automated school management system because it determines the accuracy, completeness, relevance, and timeliness of the data used in academic and administrative decision-making. According to Umaroh and Barmawi (2021), information quality exerts the strongest influence on user satisfaction among the dimensions of the DeLone and McLean Information Systems Success Model, indicating that reliable and well-structured information enhances the effectiveness of academic information systems. Similarly, Çelik and Ayaz (2022) found that high-quality information significantly increases system utilization by enabling users to access accurate and understandable academic records. Moreover, Danso et al. (2021) emphasized that information quality is an essential predictor of the success of education management information systems because it directly supports institutional planning and service delivery. These findings affirm that efficient automated school management systems depend heavily on the provision of high-quality information.

Recent empirical studies have demonstrated that information quality improves organizational efficiency by supporting informed and timely decision-making. Umaroh and Barmawi (2021) argued that academic information systems capable of producing accurate and relevant information enable administrators to formulate strategic decisions more effectively while reducing operational inefficiencies. Likewise, Ramlan and Rusdan (2025) reported that information quality is a key determinant of the overall success of academic information systems because it strengthens user confidence and institutional performance. In addition, Gormantara and Elisabeth (2023) emphasized that information quality contributes to the effectiveness of academic information systems by ensuring that institutional data remain consistent, complete, and dependable for operational activities. Collectively, these studies suggest that high-quality information serves as a foundation for efficient school management processes.

The efficiency of automated school management systems is also enhanced when information generated by the system possesses high levels of accuracy and timeliness. Çelik and Ayaz (2022) observed that students are more likely to utilize institutional information systems when the information provided is current, relevant, and free from errors, thereby improving overall system effectiveness. Similarly, Widyaningrum et al. (2024) found

that information quality significantly influences user satisfaction in learning management systems because reliable information facilitates academic activities and minimizes confusion among users. Furthermore, Akrong et al. (2021) concluded that information quality positively affects the individual impact of enterprise information systems by improving users' productivity and decision-making capabilities. These findings indicate that accurate and timely information is indispensable for enhancing the operational efficiency of automated school management systems.

Another significant contribution of information quality lies in its ability to improve institutional transparency and accountability. Danso et al. (2021) explained that education management information systems equipped with high-quality information support effective monitoring, reporting, and evaluation processes, thereby strengthening governance within educational institutions. Likewise, Umaroh and Barmawi (2021) highlighted that information quality positively influences net organizational benefits by enabling stakeholders to access dependable information for policy implementation and resource allocation. Supporting these findings, Ramlan and Rusdan (2025) asserted that educational institutions with high-quality academic information systems demonstrate greater operational consistency and improved service quality because information is readily available and trustworthy. Consequently, information quality plays a vital role in promoting efficient institutional management and accountability.

Contemporary literature further suggests that continuous enhancement of information quality is necessary to sustain the efficiency of automated school management systems. Widyaningrum et al. (2024) emphasized that educational institutions should regularly evaluate the relevance, accuracy, and completeness of system-generated information to maintain user satisfaction and organizational effectiveness. Similarly, Çelik and Ayaz (2022) recommended periodic assessment of information quality to encourage consistent system use and maximize institutional benefits. Moreover, Danso et al. (2021) concluded that improving information quality strengthens the overall success of education management information systems by fostering user trust and supporting evidence-based decision-making. Taken together, these studies establish that information quality is a fundamental determinant of the efficiency of automated school management systems and should remain a priority for continuous institutional improvement.

Efficiency of Automated School Management

System in Terms of Service Quality

Service quality is a fundamental dimension of an automated school management system because it reflects the effectiveness of technical support, responsiveness, reliability, and assistance provided to system users. Within the DeLone and McLean Information Systems Success Model, service quality influences both system utilization and user satisfaction, thereby contributing to overall organizational efficiency. Umaroh and Barmawi (2021) found that responsive and empathetic information technology support significantly enhances users' willingness to utilize academic information systems and improves satisfaction with institutional services. Similarly, Çelik and Ayaz (2022) reported that service quality positively affects the use of student information systems by ensuring that users receive timely and competent technical assistance. Likewise, Danso et al. (2021) identified service quality as a significant predictor of the success of education management information systems, emphasizing its contribution to effective educational administration and service delivery.

Recent studies indicate that high service quality strengthens the efficiency of automated school management systems by minimizing operational disruptions and improving user experiences. Widyaningrum et al. (2024) demonstrated that quality support services significantly enhance user satisfaction with learning management systems because prompt assistance allows users to resolve technical concerns efficiently. In the same vein, Syahrul et al. (2025) revealed that service quality exerts the strongest influence on user satisfaction among the evaluated dimensions of an academic information system, underscoring the importance of dependable support services in maintaining effective system performance. Moreover, Melgis et al. (2024) concluded that service quality positively contributes to the overall success of academic information systems by increasing user trust and perceived institutional benefits. These findings suggest that efficient support mechanisms are essential for sustaining automated educational services.

The efficiency of automated school management systems is also associated with the competence and responsiveness of information technology personnel. Umaroh and Barmawi (2021) emphasized that users develop greater confidence in academic information systems when technical staff provide immediate responses and effective solutions to operational issues. Similarly, Vera Mera (2021) argued that periodic evaluation of service quality enables educational institutions to identify service gaps and improve the effectiveness of academic management systems. Supporting these findings, Al Naqbi (2024) observed that service quality—including reliability, assurance, responsiveness, and empathy—positively influences operational and organizational performance in higher education institutions by facilitating uninterrupted technology utilization. Collectively, these studies demonstrate that quality technical support enhances the efficiency of automated school management systems through improved continuity and user engagement.

Service quality further contributes to institutional efficiency by promoting user satisfaction and encouraging sustained system use. Çelik and Ayaz (2022) reported that users are more likely to adopt and continuously utilize student information systems when adequate technical assistance is readily available. Likewise, Gurendrawati et al. (2022) found that service quality has a significant positive effect on user satisfaction in academic service systems, highlighting the importance of support services in achieving successful information system implementation. In addition, Alfaki (2021) established that collaboration, interaction, and service support within blended learning systems significantly improve both system use and student satisfaction, ultimately increasing the benefits derived from educational technologies. These findings reinforce the role of service quality as a catalyst for efficient institutional operations and improved stakeholder experiences.

Current literature emphasizes that continuous enhancement of service quality is necessary to sustain the efficiency of automated school management systems. Syahrul et al. (2025) recommended regular evaluation of user support services alongside technical system assessments to ensure that academic information systems continue to meet institutional and user expectations. Similarly, Melgis et al. (2024) argued that strengthening service quality increases user satisfaction and maximizes the net benefits of academic information systems. Furthermore, Danso et al. (2021) concluded that service quality should remain a strategic priority because it directly affects system success, user acceptance, and organizational performance. Taken together, these studies establish that responsive, reliable, and user-centered support services are indispensable for enhancing the efficiency and long-term sustainability of automated school management systems.

Efficiency of Automated School Management

System in Terms of Usability

Usability is a fundamental attribute of an automated school management system because it determines how effectively and efficiently users can accomplish academic and administrative tasks. Systems with intuitive interfaces, simple navigation, and minimal complexity encourage greater acceptance and continuous utilization among stakeholders. Studies by Çelik and Ayaz (2022), Umaroh and Barmawi (2021), and Ramlan and Rusdan (2025) consistently demonstrated that user-friendly academic information systems improve user engagement, operational efficiency, and institutional performance by reducing the effort required to complete routine transactions and retrieve information. These findings suggest that usability is an essential determinant of the effectiveness and sustainability of automated school management systems.

The efficiency of automated school management systems is enhanced when usability supports seamless interaction between users and digital platforms. Çelik and Ayaz (2022) found that systems characterized by ease of use and accessible interfaces significantly increase system utilization because users experience fewer technical barriers during academic processes. Likewise, Syahrul et al. (2025) reported that the usability dimension, measured using the System Usability Scale (SUS), obtained favorable ratings, indicating that a well-designed academic information system facilitates efficient user interaction and supports educational services. Similarly, Rachmat et al. (2022) observed that user-friendly academic information systems positively influence individual effectiveness by enabling users to perform institutional tasks with greater accuracy and convenience. These studies collectively emphasize that usability contributes directly to improved institutional productivity.

Usability also influences user satisfaction and the perceived benefits derived from automated school management systems. Umaroh and Barmawi (2021) argued that systems designed with understandable features and accessible functions encourage positive user experiences and strengthen confidence in digital academic services. In addition, Nugraheni and Bayastura (2021) demonstrated that ease of interaction with an academic attendance system significantly affects users' satisfaction and perceived usefulness, thereby enhancing the overall effectiveness of institutional information systems. Supporting these findings, Alfaki (2021) concluded that accessible interfaces and interactive system features promote sustained use and maximize the educational benefits of technology-supported learning environments. These results indicate that usability strengthens both user acceptance and organizational efficiency.

Recent literature further suggests that usability improves operational efficiency by minimizing user errors and reducing the need for extensive technical assistance. Syahrul et al. (2025) emphasized that systems complying with recognized software quality standards exhibit higher levels of functional suitability and usability, enabling users to complete academic processes more efficiently. Likewise, Ramlan and Rusdan (2025) found that user-friendly academic information systems increase satisfaction and institutional benefits because stakeholders can access and process information without unnecessary difficulty. Furthermore, Çelik and Ayaz (2022) highlighted that intuitive system design encourages consistent system use, thereby supporting the long-term success of educational information systems. These findings demonstrate that usability is closely associated with efficient institutional operations and service delivery.

Modern studies emphasize the importance of continuously evaluating usability to sustain the efficiency of automated school management systems. Syahrul et al. (2025) recommended periodic usability assessments using internationally recognized evaluation standards to identify areas for system enhancement and improve user experience. Similarly, Rachmat et al. (2022) argued that ongoing evaluation of academic information systems enables institutions to strengthen system effectiveness and maximize individual performance. Moreover, Umaroh and Barmawi (2021) asserted that enhancing usability contributes to greater system acceptance, improved service delivery, and increased organizational benefits. Collectively, these studies establish that usability is a strategic component of automated school management systems and a key factor in achieving efficient educational management.

Efficiency of Automated School Management

System in Terms of Reliability

Reliability is a fundamental dimension of automated school management systems because it ensures that institutional processes are executed consistently, accurately, and with minimal system failure. Recent studies emphasize that reliable systems maintain uninterrupted access to student records, financial transactions, and academic information, thereby supporting administrative continuity and informed decision-making. High system reliability also minimizes data inconsistencies and operational delays, enabling educational institutions to deliver quality services more efficiently. Consequently, reliability has become a critical indicator in evaluating the effectiveness of digital management platforms in higher education (Danso et al., 2021; Grepon et al., 2021; Redoblo, 2021).

The adoption of international software quality standards has reinforced the importance of reliability in school management systems. Based on the ISO/IEC 25010 framework, reliability encompasses system maturity, fault tolerance, recoverability, and availability, all of which contribute to continuous institutional operations. Studies have shown that educational information systems exhibiting high reliability generate greater user confidence and improve organizational performance by reducing interruptions and preserving data integrity. These findings suggest that reliability directly influences the overall efficiency and sustainability of automated school management systems (Syahrul et al., 2025; Grepon et al., 2021; Danso et al., 2021).

Empirical investigations conducted in higher education institutions demonstrate that reliable automated systems significantly enhance administrative productivity and service delivery. In developing an e-school management system for a Philippine community college, Grepon et al. (2021) reported that respondents rated the system highly in terms of reliability, indicating dependable performance in processing and retrieving

institutional data. Similarly, Benitez and Serrano (2021) found that improvements in an automated student identification management system substantially increased its reliability compared with its earlier version. Likewise, Redoblo (2021) concluded that reliable online management systems facilitate secure documentation, efficient monitoring, and consistent assessment processes within educational institutions.

Recent literature further indicates that reliability strengthens user satisfaction and promotes successful information system implementation. The Education Management Information System (EMIS) success model developed by Danso et al. (2021) established that system quality significantly contributes to user satisfaction and the net benefits derived from educational information systems. Reliable platforms reduce technical errors and ensure continuous accessibility, encouraging greater utilization among administrators and academic personnel. Moreover, integrated quality evaluation models recommend continuous monitoring and maintenance of system reliability to sustain long-term operational effectiveness and institutional performance (Danso et al., 2021; Syahrul et al., 2025; Hart, 2021).

Overall, contemporary research consistently recognizes reliability as a vital determinant of the efficiency of automated school management systems. Reliable systems support accurate information processing, uninterrupted service delivery, and effective institutional management while reducing operational risks associated with data loss or system failure. As educational institutions continue to digitize their administrative functions, ensuring system reliability remains essential for achieving organizational efficiency and improving stakeholder satisfaction. These findings provide strong theoretical support for examining reliability as a key dimension in assessing the efficiency of automated school management systems and in designing appropriate intervention programs (Grepon et al., 2021; Danso et al., 2021; Benitez & Serrano, 2021).

Efficiency of Automated School Management

System in Terms of Accessibility

Accessibility is a critical dimension of the efficiency of automated school management systems because it determines the extent to which users can conveniently access institutional services, information, and resources regardless of time, location, or device. Contemporary educational institutions increasingly rely on digital platforms that provide seamless access to enrollment records, academic reports, financial transactions, and administrative services. Studies indicate that systems designed with accessible interfaces improve operational efficiency by reducing transaction time, increasing user participation, and facilitating continuous communication among stakeholders (Grepon et al., 2021; Redoblo, 2021; Botelho, 2021).

Recent investigations emphasize that accessibility extends beyond system availability to include inclusive design that accommodates diverse user needs. Educational management systems should provide intuitive navigation, compatibility with assistive technologies, and flexible access across multiple digital platforms to ensure equitable participation. Research on accessible learning management systems revealed that inadequate accessibility features create barriers for users with disabilities, thereby limiting the effectiveness of educational technologies. Conversely, accessible digital environments promote greater engagement, satisfaction, and institutional inclusivity (Karovska Ristovska et al., 2021; Botelho, 2021; Kuppusamy & Balaji, 2021).

Empirical studies in higher education demonstrate that automated school management systems with enhanced accessibility significantly improve administrative processes and information dissemination. Grepon et al. (2021) found that a centralized e-school management system enabled users to access academic and administrative records more efficiently through a unified digital platform. Similarly, Redoblo (2021) reported that an online management system facilitated document retrieval, assessment monitoring, and communication through remote access capabilities, thereby increasing institutional productivity. These findings suggest that accessible systems reduce procedural delays and enhance the delivery of educational services (Grepon et al., 2021; Redoblo, 2021; Brombuela et al., 2021).

Accessibility also influences user acceptance and the sustained utilization of educational information systems. Studies have shown that when users can easily access digital services through user-friendly interfaces and multiple communication channels, they exhibit higher levels of satisfaction and continued system usage. The

integration of accessible features minimizes technological barriers and supports informed decision-making among administrators, faculty members, and students. Consequently, accessibility contributes not only to operational efficiency but also to the successful implementation of school management technologies (Brombuela et al., 2021; Karovska Ristovska et al., 2021; Saad & Daud, 2020).

Overall, the literature consistently identifies accessibility as an essential determinant of the efficiency of automated school management systems. Systems that provide convenient, inclusive, and uninterrupted access to institutional services enhance administrative effectiveness, optimize resource utilization, and improve stakeholder experiences. As educational institutions continue to embrace digital transformation, strengthening system accessibility remains fundamental to achieving sustainable operational excellence and quality service delivery. These findings provide substantial support for evaluating accessibility as a key indicator in assessing the efficiency of automated school management systems and in developing appropriate intervention programs (Grepon et al., 2021; Botelho, 2021; Redoblo, 2021).

Efficiency of Automated School Management

System and Respondent Category

Differences in respondent category have been identified as an important consideration in assessing the efficiency of Automated School Management Systems (ASMS), as stakeholders interact with the system according to their respective institutional roles. Administrators generally evaluate system efficiency based on its support for strategic planning and decision-making, teachers emphasize instructional and records management functions, while technical personnel and end-users focus on system reliability and operational performance. These varying responsibilities create distinct perceptions regarding system effectiveness, highlighting the need to compare efficiency across respondent groups (Grepon et al., 2021; Magtoto et al., 2022; Villanueva, 2022).

Studies involving school administrators consistently demonstrate that management information systems improve organizational efficiency by accelerating report generation, strengthening data management, and supporting evidence-based administrative decisions. Because administrators primarily utilize system outputs for planning and governance, they tend to evaluate efficiency in terms of operational control and institutional performance. These findings indicate that administrative respondents often exhibit significantly different perceptions from instructional personnel due to the strategic nature of their responsibilities (Magtoto et al., 2022; Grepon et al., 2021; Guha, 2021).

Teachers represent another major respondent category whose assessment of automated school management systems is influenced by daily classroom and academic responsibilities. Research shows that automation reduces clerical workload, enhances record accuracy, and simplifies grading and learner monitoring, allowing educators to devote greater attention to instruction. Consequently, teachers commonly evaluate efficiency based on usability, functionality, and the extent to which the system supports routine academic tasks, producing perceptions that may differ from those of administrators and technical personnel (Brombuela et al., 2021; Matias & Timosan, 2021; Sor, 2022).

Comparative investigations further suggest that end-users with different institutional functions develop distinct expectations regarding automated systems because their operational needs vary considerably. System providers and information technology personnel frequently assess efficiency through technical quality, maintenance, and system integration, whereas faculty members and academic users prioritize convenience, accessibility, and service responsiveness. Such functional diversity explains why statistically significant differences in efficiency ratings may emerge when respondents are grouped according to their category or organizational role (Villanueva, 2022; Mehrolia et al., 2021; Grepon et al., 2021).

Overall, contemporary literature supports the inclusion of respondent category as a grouping variable in evaluating the efficiency of Automated School Management Systems. Differences in institutional responsibilities, frequency of system interaction, and performance expectations shape users' perceptions of effectiveness and efficiency. Examining these variations provides a comprehensive understanding of system

performance across stakeholder groups and generates valuable evidence for developing targeted intervention programs that address the specific needs of administrators, teachers, and other users (Matias & Timosan, 2021; Magtoto et al., 2022; Villanueva, 2022).

Efficiency of Automated School Management

System and Length of System Utilization

The length of system utilization has been recognized as a significant factor influencing users' perceptions of the efficiency of Automated School Management Systems (ASMS). Users who have interacted with a system for longer periods generally develop greater familiarity with its functionalities, resulting in improved operational competence and higher evaluations of system effectiveness. Extended exposure enables users to integrate digital processes into routine administrative tasks, thereby enhancing productivity and reducing transaction time. Consequently, differences in efficiency ratings often emerge between novice and experienced users because prolonged utilization facilitates technology adaptation and organizational learning (Grepon et al., 2021; Al-Hunaiyyan et al., 2021; Danso et al., 2021).

Empirical studies indicate that users with longer experience in utilizing school information systems exhibit greater confidence in performing administrative and academic functions than recently introduced users. Continuous system use promotes familiarity with workflows, minimizes operational errors, and strengthens users' ability to exploit advanced features that improve institutional efficiency. Conversely, users with limited exposure often encounter adjustment difficulties that may negatively influence their perceptions of system performance and effectiveness, suggesting that utilization period contributes to variations in efficiency assessments (Grepon et al., 2021; Brombuela et al., 2021; Azeroual et al., 2021).

The relationship between continued system utilization and perceived efficiency is likewise supported by technology acceptance and information systems success research. Sustained interaction with digital platforms increases users' perceived ease of use and perceived usefulness, both of which contribute to higher satisfaction and more efficient task accomplishment. Long-term users are more likely to develop positive behavioral intentions toward system adoption because repeated exposure reinforces technical competence and confidence in system reliability. These findings imply that the duration of system utilization may produce statistically significant differences in efficiency perceptions among stakeholder groups (Alzahrani & Seth, 2021; Danso et al., 2021; Al-Hunaiyyan et al., 2021).

Within educational institutions, the gradual integration of automated management systems into daily operations enables personnel to optimize administrative processes over time. As users accumulate experience, they become more proficient in data retrieval, report generation, scheduling, and records management, resulting in improved organizational performance. Continuous utilization also encourages users to identify system capabilities that support decision-making and service delivery, thereby increasing perceived efficiency compared with individuals who have only recently adopted the technology (Grepon et al., 2021; Ceniza, 2021; Brombuela et al., 2021).

Overall, contemporary literature suggests that the length of system utilization constitutes an important explanatory variable when examining the efficiency of Automated School Management Systems. Differences in experience levels shape users' familiarity, confidence, adaptability, and satisfaction, which collectively influence efficiency evaluations. For this reason, grouping respondents according to their duration of system use provides a meaningful basis for identifying disparities in system performance perceptions and for designing intervention programs that strengthen user training, technical support, and continuous system enhancement (Danso et al., 2021; Alzahrani & Seth, 2021; Grepon et al., 2021).

RESEARCH METHODOLOGY

This chapter discusses the research design of the study, specifies the target subjects and respondents, delineates the population and sample size, explains the sampling technique used, presents the data-gathering instruments

along with their validity and reliability procedures, and details the processes employed for data gathering and analysis.

Research Design

This study employed a quantitative, descriptive-comparative research design, which is appropriate for systematically assessing the efficiency of the Automated School Management System as perceived by its end users and for determining variations in these perceptions when respondents are grouped according to their profile variables. This design enables the collection and analysis of numerical data without manipulating any research variables, thereby providing an objective description of the existing condition of the system within its actual institutional setting. Using a structured survey questionnaire, the study gathered quantifiable data on the efficiency of the Automated School Management System in terms of system quality, information quality, service quality, usability, reliability, and accessibility, as evaluated by institutional academic and administrative personnel. Quantitative descriptive research is particularly suitable for studies that seek to describe characteristics, measure perceptions, and examine differences among groups using statistical procedures (Creswell & Creswell, 2023).

This framework provided empirical evidence regarding the current level of efficiency of the Automated School Management System and identified whether significant differences exist based on respondent category and length of system utilization. The findings served as a basis for recognizing the system's strengths and areas requiring enhancement across its major dimensions. Furthermore, the results established a sound foundation for the formulation of an evidence-based intervention program aimed at improving system performance, optimizing institutional processes, enhancing user satisfaction, and strengthening the delivery of academic and administrative services through continuous digital innovation.

Subject and Respondents of the Study

The subject and respondents of this study comprised the primary stakeholders who regularly utilize the Automated School Management System implemented at one of the local higher education institutions in the Negros Island Region. Specifically, the respondents included full-time permanent and full-time contractual faculty members, enrollment personnel, program heads, deans, personnel from the Office of the Vice President for Academic Affairs, and personnel from the Registrar's Office, all of whom actively engage with the system in carrying out academic and administrative functions. These stakeholder groups were selected because their continuous interaction with the ASMS enables them to provide informed and comprehensive assessments of its operational efficiency. The inclusion of diverse respondent categories ensured that the investigation captured multiple perspectives regarding the system's performance across various institutional functions. Their evaluations served as the primary source of empirical data in assessing the efficiency of the Automated School Management System in terms of system quality, information quality, service quality, usability, reliability, and accessibility.

Population and Sample Size

The population of the study consisted of the primary institutional stakeholders who actively utilized the Automated School Management System at the participating local higher education institution in the Negros Island Region. These included full-time permanent and contractual faculty members, enrolling officers, program heads, deans, personnel from the Office of the Vice President for Academic Affairs, and personnel from the Registrar's Office.

A total of 200 respondents participated in the study. The sample consisted of 150 faculty members, 16 enrolling officers, 13 program heads, 5 deans, 6 personnel from the Office of the Vice President for Academic Affairs, and 10 personnel from the Registrar's Office. These respondents were included because they regularly interacted with the ASMS in performing academic and administrative functions and could therefore provide direct assessments of its perceived efficiency.

Sampling Techniques

This study employed purposive quota sampling, a non-probability sampling technique that combines the deliberate selection of participants possessing specific characteristics with the allocation of predetermined quotas for each respondent category. Under purposive sampling, respondents were intentionally selected because they possess the knowledge and experience necessary to provide relevant information regarding the phenomenon under investigation, while quota sampling ensures that identified subgroups are represented according to the required number of participants established by the researcher (Nikolopoulou, 2023).

The use of purposive quota sampling was deemed appropriate because the study sought to obtain evaluations from stakeholders who directly utilize the Automated School Management System in the performance of their academic and administrative responsibilities. Only individuals with actual experience and regular interaction with the system were included to ensure that the data gathered accurately reflected the efficiency of the platform across its various functional dimensions. The predetermined quotas ensured adequate representation of the institution's principal stakeholder groups, thereby facilitating a comprehensive assessment of the efficiency of the Automated School Management System and providing a reliable empirical basis for the development of an appropriate intervention program.

Data Gathering Instrument

The primary data-gathering instrument utilized in this study was a researcher-made survey questionnaire, specifically designed to determine the efficiency of the Automated School Management System and to generate empirical data that served as the basis for the proposed intervention program. The content was structured to ensure that each item appropriately measures the constructs identified in the statement of the problem.

The instrument was composed of two major parts. Part I gathered the demographic profile of the respondents, including their respondent category and length of system utilization, which serve as the grouping variables for the comparative analysis of the study.

Part II was adapted primarily from the DeLone and McLean Information Systems Success Model (2003). Particularly, it measured the efficiency of the Automated School Management System using a structured five-point Likert scale ranging from 5 (Very Efficient) to 1 (Not Efficient). The questionnaire consists of 30 indicators distributed equally across six dimensions of system efficiency, namely system quality, information quality, service quality, usability, reliability, and accessibility, with five statements allocated to each dimension. These indicators were formulated to assess the respondents' perceptions regarding the system's operational performance, quality of information, support services, ease of use, dependability, and accessibility. Since the questionnaire did not achieve the five-year recency criterion, it underwent appropriate validation and reliability procedures to ensure the study's accuracy and dependency, which gave timely and empirical results in accordance with the main objective.

Validity and Reliability of the Instruments

To ensure data precision and consistency, the instrument was subjected to proper validity and reliability testing prior to implementation in the actual collection process.

To establish the validity of the instrument, the researcher-made questionnaire was subjected to expert evaluation by 5 college personnel and educational management specialists, which composed of one Vice President for Administration and Human Resource, two College Deans, one Planning and Development Officer, and one Program Head. Their recommendations were incorporated to enhance the clarity, relevance, and adequacy of the instrument. Using the Lawshe's Content Validity Ratio (CVR) developed by C.H. Lawshe (1975), the instrument obtained a CVR value of 1, interpreted as having strong content validity, indicating that the entire items were essential and appropriate to measure the variables of the study.

Subsequently, to establish reliability, a pilot test was conducted among 30 respondents at another local higher education institutional in Negros Island Region who possess characteristics similar to, but are not included in, the actual respondents of the study. The reliability of the instrument was determined using Cronbach's alpha, which obtained an index of 0.989, which shows an excellent internal consistency among the items included in the instrument.

These procedures established the instruments' dependability and credibility, thereby ensuring the generation of valid data suitable for examining the efficiency of the Automated School Management System implemented at a local higher education institution in Negros Island Region as perceived by various stakeholders and direct users.

Data Gathering Procedures

Prior to the conduct of the study, the researcher secured approval from the from the College President of the participating higher education institution (See Appendix B.1) to administer the research instrument and conduct the data-gathering process. Upon approval, coordination was made with the concerned office heads and college deans to facilitate the orderly distribution and retrieval of the survey questionnaires while ensuring minimal disruption to institutional operations.

Eligible respondents were identified based on the established inclusion criteria and sampling procedure. Before distributing the questionnaires, the researcher explained the objectives of the study, emphasized the voluntary nature of participation, and assured the respondents that their responses would be treated with strict confidentiality and used solely for academic and research purposes.

The questionnaires were personally administered to the selected respondents, allowing them sufficient time to complete the instrument. The researcher remained available to address clarifications regarding the questionnaire without influencing the participants' responses. After completion, all questionnaires were immediately collected and reviewed to ensure completeness and accuracy of the entries.

Following the retrieval of the accomplished questionnaires, the responses were systematically encoded, organized, and verified for consistency. The collected data were then prepared for statistical treatment in accordance with the objectives of the study to determine the efficiency of the Automated School Management System and to provide an empirical basis for the formulation of an appropriate intervention program.

Data Analyses

The following statistical techniques were systematically employed to analyze the dataset, ensuring methodological rigor and alignment with the study's stated objectives.

To answer statement of the problem number 1, which states, what is the profile of the respondents in terms of respondent category, and length of system utilization, frequency and percentage was used, with the formula:

$$\% = \frac{f}{N} \times 100$$

Where:

f – number of respondents

N – total number of respondents

% – percentage

To answer the statement of the problem number 2, which states, what is the level of efficiency of the Automated School Management System in terms of system quality, information quality, service quality, usability, reliability, and accessibility, mean and standard deviation were used.

Formula for mean:

$$\bar{x} = \frac{\sum x}{n}$$

Where:

$\bar{x}$ – mean

Σ – summation notation

x – scores

n – number of scores or sample size

Formula for standard deviation:

$$s = \sqrt{\frac{\sum (X - \bar{X})^2}{n - 1}}$$

Where:

s – standard deviation

X – raw score

$\bar{X}$ – mean score

N – number of scores in the distribution

The table on the next page was used to interpret the mean values obtained describing the level of efficiency of the Automated School Management System.

Scale	Mean Score Range	Interpretation	Verbal Description
5	4.21 – 5.00	Highly Efficient	The Automated School Management System demonstrates an exceptional level of efficiency across system quality, information quality, service quality, usability, reliability, and accessibility. Its features and function consistently satisfy users' needs, enabling seamless operations and supporting optimal institutional performance.

4	3.41 – 4.20	Efficient	The Automated School Management System exhibits a high degree of efficiency in delivering quality services and dependable system performance. While minor improvements may further enhance its effectiveness, the system adequately supports users in accomplishing their academic and administrative tasks.
3	2.61 – 3.40	Moderately Efficient	The Automated School Management System provides an acceptable level of efficiency in its core functions and operational processes. However, certain aspects of system quality, information quality, service quality, usability, reliability, or accessibility require refinement to achieve better overall performance and user satisfaction.
2	1.81 – 2.60	Less Efficient	The Automated School Management System demonstrates a below-average level of efficiency, limiting its ability to consistently meet users' expectations and operational requirements. Deficiencies in one or more dimensions adversely affect system functionality and indicate the need for targeted improvements and corrective measures.
1	1.00 – 1.80	Not Efficient	The Automated School Management System fails to provide the level of efficiency necessary to effectively support institutional processes and user needs. Significant weaknesses across its quality dimensions impede its functionality, highlighting the necessity for comprehensive intervention and system redevelopment.

To answer the statement of the problem number 3, which states, is there a significant difference in the efficiency of the Automated School Management System when grouped according to respondents' profile, Kruskal-Wallis' H-test was used, with the following formula:

$$H = \frac{12}{n(n+1)} \sum \frac{R_i^2}{n_i} - 3(n+1)$$

where:

n = Total number of participants

R_i² = Total rank for each group

n_i = Number of participants in each group

Presentation, Analysis, and Interpretation of Data

This chapter presents the systematic organization, statistical analysis, and interpretive discussion of the collected data. The data were comprehensively structured and examined through appropriate statistical techniques to directly address the research problem.

Profile of the Respondents

The table below highlights the distribution of profile of respondents in terms of respondent category and length of system utilization.

Table 1. Frequency and Percent Distribution of the Demographic Profile of Respondents.

Profile	Category	f	%
Respondent Category			
	Faculty Member	150	75.00
	Enrolling Officer	16	8.00
	Program Head	13	6.50
	Dean	5	2.50
	Office of the Vice President for Academic Affairs Personnel	6	3.00
	Registrar's Office Personnel	10	5.00
	Total	200	100.00
Length of System Utilization			
	Less than 1 year	2	1.00

	1–2 years	33	16.50
	3–4 years	74	37.00
	5 years and above	91	45.50
	Total	200	100.00

As shown in Table 1, in terms of respondent category, the majority were faculty members ($f = 150$, 75.00%), followed by enrolling officers ($f = 16$, 8.00%), program heads ($f = 13$, 6.50%), registrar's office personnel ($f = 10$, 5.00%), Office of the Vice President for Academic Affairs personnel ($f = 6$, 3.00%), and deans ($f = 5$, 2.50%). The findings indicate that the majority of the respondents were primary users of the Automated School Management System, particularly faculty members, who regularly interact with the system for academic and administrative transactions. Their substantial representation provides a broad perspective on the system's efficiency and functionality across its major user groups. The predominance of faculty members indicates that the assessment of the Automated School Management System (ASMS) was primarily informed by individuals who regularly interact with the system in carrying out instructional, academic, and administrative responsibilities.

Recent studies support previous studies emphasizing the importance of gathering feedback from multiple stakeholders when evaluating educational information systems. A study by Mitschek et al. (2024) found that students, faculty members, and administrative personnel play critical roles in assessing the effectiveness of integrated student information systems because each group interacts with distinct system functions and services. Similarly, Mintah et al. (2024) reported that stakeholder-based evaluations provide a comprehensive understanding of system performance and utilization within educational institutions. Furthermore, Daim et al. (2024) highlighted that users' experiences and perceptions significantly influence the adoption and continued use of student information systems in higher education.

With respect to the length of system utilization, the largest group of respondents had been using the Automated School Management System for 5 years and above ($f = 91$, 45.50%), followed by those with 3–4 years of experience ($f = 74$, 37.00%), 1–2 years ($f = 33$, 16.50%), and less than one year ($f = 2$, 1.00%). The findings indicate that most respondents possessed extensive experience in using the ASMS, suggesting that their evaluations were based on prolonged and continuous interaction with the system rather than on limited or initial exposure. Long-term users are generally more capable of assessing system quality, reliability, and operational efficiency because they have experienced the system under varying institutional demands and operational conditions. Consequently, the respondents' familiarity with the system strengthens the credibility and dependability of the data gathered in the study. The results align with existing literature indicating that the duration of system use influences users' familiarity, acceptance, and evaluation of information systems. Daim et al. (2024) observed that continued interaction with student information systems enhances user competence and positively affects technology adoption. Likewise, Lating et al. (2021) found that prolonged use of academic information systems improves users' perceptions of system quality, information quality, and overall satisfaction. Moreover, Akwene (2024) emphasized that sustained engagement with educational technologies enables users to better recognize system benefits and operational effectiveness.

Level of Efficiency of the Automated School

Management System

The table on the succeeding page shows the level of efficiency of the Automated School Management System as a whole and in terms of system quality, information quality, service quality, usability, reliability, and accessibility.

Table 2. Level of Efficiency of the Automated School Management System as a whole and in terms of System Quality, Information Quality, Service Quality, Usability, Reliability, and Accessibility.

Statements	Mean	SD	Interpretation
System Quality	3.69	0.65	Efficient
1. The system functions properly without frequent errors.	3.55	0.88	Efficient
2. The system processes transactions efficiently.	3.95	0.72	Efficient
3. The system responds quickly during usage.	3.76	0.74	Efficient
4. The system is available whenever needed.	3.68	1.07	Efficient
5. The system performs consistently during peak transactions.	3.50	0.89	Efficient
Information Quality	4.11	0.67	Efficient
6. The information generated by the system is accurate.	4.21	0.72	Highly Efficient
7. The system provides complete information needed by users.	4.14	0.85	Efficient
8. Information is updated in a timely manner.	4.04	0.87	Efficient
9. Information from the system is relevant to users' needs.	4.12	0.79	Efficient
10. Reports generated by the system are reliable.	4.03	0.74	Efficient
Service Quality	3.90	0.80	Efficient
11. System administrator can effectively solve any system issues.	3.88	0.89	Efficient
12. System issues are resolved quickly by the administrator.	3.97	0.91	Efficient
13. Users receive adequate assistance when experiencing problems.	3.76	0.96	Efficient
14. System administrator can be accessed any time of the day.	3.91	0.82	Efficient
15. Regular system maintenance improves service delivery.	3.97	0.87	Efficient
Usability	4.23	0.72	Highly Efficient
16. The system is easy to learn and use.	4.37	0.73	Highly Efficient
17. The system interface is user friendly.	4.24	0.86	Highly Efficient
18. Navigation within the system is easy to understand.	4.29	0.82	Highly Efficient
19. Users can accomplish tasks with minimal difficulty.	3.99	0.92	Efficient
20. The system improves work efficiency.	4.25	0.80	Highly Efficient

Continuation of Table 2

Reliability	4.08	0.71	Efficient
21. The system consistently performs its intended functions.	4.19	0.78	Efficient
22. The system accurately stores and retrieves records.	4.21	0.79	Highly Efficient
23. The system safeguards data effectively.	4.24	0.74	Highly Efficient
24. The system minimizes errors in transactions.	3.87	0.87	Efficient
25. The system minimizes errors in reports.	3.92	0.84	Efficient
Accessibility	4.06	0.68	Efficient
26. The system can be accessed whenever needed.	3.95	0.96	Efficient
27. Users can access the system from multiple devices.	4.10	0.81	Efficient
28. Access to system features is convenient.	4.08	0.81	Efficient
29. The system supports the needs of various users.	4.09	0.72	Efficient
30. The system facilitates efficient access to information and services.	4.09	0.76	Efficient
As a Whole	4.01	0.63	Efficient
Legend: (4.21 – 5.00) Highly Efficient; (3.41 – 4.20) Efficient; (2.61 – 3.40) Moderately Efficient; (1.81 – 2.60) Less Efficient; (1.00 – 1.80) Not Efficient			

Table 2 presents the level of efficiency of the Automated School Management System in terms of system quality, information quality, service quality, usability, reliability, and accessibility. The overall mean score of 4.01 (SD = 0.63) indicates that the system is efficient, suggesting that respondents generally perceived the Automated School Management System as capable of supporting school operations effectively and consistently. The relatively low standard deviation further implies a reasonable level of agreement among respondents regarding the system's performance across the assessed dimensions.

The present finding is supported by the study of Danso et al. (2021), which validated the DeLone and McLean Information Systems Success Model in an Education Management Information System (EMIS) context and found that system quality, information quality, and service quality significantly contributed to system use, user satisfaction, and overall system success. Similarly, Elmunsyah et al. (2023) reported that the quality dimensions of a learning management system positively influenced user satisfaction and perceived benefits, indicating that well-designed educational information systems enhance institutional effectiveness.

Moreover, Marumpe et al. (2026) found that system quality, information quality, and service quality significantly affected user satisfaction and performance in an academic information system, highlighting the importance of integrated and efficient digital platforms in improving educational management processes. These studies collectively affirm that high-quality information systems contribute to operational efficiency and stakeholder satisfaction within educational institutions.

Among the six indicators, usability obtained the highest mean score (M = 4.23, SD = 0.72), interpreted as highly efficient. This finding indicates that users find the system easy to learn, navigate, and operate, thereby

facilitating the completion of administrative and academic tasks with minimal difficulty. Specifically, the statement “The system is easy to learn and use” recorded the highest mean ($M = 4.37$, $SD = 0.73$), highlighting the importance of user-friendly design in promoting system acceptance and productivity.

This result aligns with the findings of Almaiah et al. (2022) and Al-Emran et al. (2023), who emphasized that ease of use and intuitive interfaces significantly contribute to the successful implementation and utilization of educational information systems.

Information quality ranked second with a mean of 4.11 ($SD = 0.67$), interpreted as efficient. Respondents perceived the information generated by the system as accurate, relevant, timely, and complete. Notably, the statement “The information generated by the system is accurate” achieved a highly efficient rating ($M = 4.21$, $SD = 0.72$), indicating strong confidence in the quality of system-generated data.

This finding supports the work of Nguyen et al. (2021) and Kwarteng et al. (2022), who reported that information accuracy and reliability are critical determinants of user satisfaction and system effectiveness in educational management platforms.

In terms of reliability, the system obtained an efficient rating ($M = 4.08$, $SD = 0.71$). Respondents acknowledged the system's ability to consistently perform its intended functions, accurately manage records, and safeguard institutional data. The highest-rated items under this dimension were “The system safeguards data effectively” ($M = 4.24$, $SD = 0.74$) and “The system accurately stores and retrieves records” ($M = 4.21$, $SD = 0.79$), both interpreted as highly efficient.

These findings corroborate studies by Alsyounf et al. (2022) and Salloum et al. (2023), which identified reliability and data security as essential factors influencing trust and continued use of digital management systems.

Similarly, Accessibility received an efficient rating ($M = 4.06$, $SD = 0.68$), indicating that users can conveniently access system features, information, and services across different devices and operational contexts. This suggests that the system effectively supports the diverse needs of stakeholders while ensuring continuous access to institutional resources.

The result is consistent with findings by Haleem et al. (2022) and Bond et al. (2021), who emphasized that accessibility enhances user engagement and promotes the effective delivery of educational services through digital platforms.

Service quality also yielded an efficient rating ($M = 3.90$, $SD = 0.80$), reflecting respondents' favorable perceptions of the support provided by system administrators. The findings suggest that technical concerns are generally addressed promptly and that maintenance activities contribute positively to service delivery.

This observation aligns with the studies of Sharma et al. (2022) and Almaiah et al. (2021), which found that responsive technical support and effective system maintenance strengthen user satisfaction and overall system performance.

Lastly, system quality registered the lowest mean among the dimensions, although it remained within the efficient category ($M = 3.69$, $SD = 0.65$). Respondents recognized the system's ability to process transactions efficiently and maintain acceptable responsiveness; however, comparatively lower ratings for system availability and performance during peak transactions suggest areas for improvement.

These findings support the conclusions of DeLone and McLean-based studies by Ramírez-Correa et al. (2022) and Al-Fraihat et al. (2021), which indicate that system stability, speed, and scalability remain critical factors in maximizing the effectiveness of educational information systems.

Difference in the Efficiency of the Automated

School Management System When Grouped

According to Respondent Category

The following table presents the difference in the efficiency of the Automated School Management System when grouped according to respondent category.

Table 3a. Difference in the Efficiency of the Automated School Management System When Grouped According to Respondent Category.

Respondent Category	Test Statistics (H)	p-value	Decision for H ₀	Interpretation
Faculty Member	7.909	.161	Fail to Reject H ₀	Not Significant
Enrolling Officer				
Program Head				
Dean				
Office of the Vice President for Academic Affairs Personnel				
Registrar's Office Personnel				

The results revealed a test statistic of $H = 7.909$ with a p-value of .161, which is greater than the .05 level of significance. Hence, the null hypothesis was not rejected, indicating no statistically significant difference in the perceived efficiency of the Automated School Management System among students, faculty members, enrolling officers, program heads, deans, Office of the Vice President for Academic Affairs personnel, and Registrar's Office personnel ($H = 7.909$, $p = .161$). This finding suggests that the system is perceived consistently across various stakeholder groups, implying that its functionalities, performance, and services effectively meet the needs of different users regardless of their institutional roles.

The result further indicates that the system provides a relatively uniform user experience, enabling stakeholders to perform academic and administrative tasks efficiently. The absence of significant variation among respondent groups may reflect the system's ability to deliver standardized services, accessible information, and reliable support mechanisms throughout the institution. Such consistency is essential in fostering user acceptance and ensuring the effective implementation of digital management systems in higher education settings.

This finding is supported by recent studies demonstrating that educational management systems are often perceived similarly by different stakeholder groups when the systems are well-designed and user-centered. For instance, Al-Rahmi et al. (2022) found that system quality, information quality, and service quality positively influence users' perceptions regardless of their role within educational institutions. Similarly, Mtebe and Raisamo (2022) reported that effective educational information systems generate comparable satisfaction and usability ratings among diverse user groups due to standardized functionalities and consistent access to services. Moreover, Almaiah et al. (2023) emphasized that the successful implementation of educational

technologies promotes equitable user experiences across stakeholders, resulting in comparable assessments of system efficiency and effectiveness.

Difference in the Efficiency of the Automated

School Management System When Grouped

According to Length of System Utilization

The table on the next page discusses the difference in the efficiency of the Automated School Management System when grouped according to length of system utilization.

Table 3b. Difference in the Efficiency of the Automated School Management System When Grouped According to Length of System Utilization.

Respondent Category	Test Statistics (H)	p-value	Decision for H_0	Interpretation
Less than 1 year	0.207	.976	Fail to Reject H_0	Not Significant
1–2 years				
3–4 years				
5 years and above				

Using Kruskal–Wallis H-test, the result of the revealed no statistically significant difference in the perceived efficiency of the Automated School Management System across the four groups of users, namely less than 1 year, 1–2 years, 3–4 years, and 5 years and above ($H = 0.207$, $p = .976$). Since the obtained p-value exceeded the .05 level of significance, the null hypothesis was not rejected. This indicates that respondents, regardless of how long they had been using the system, shared relatively similar perceptions regarding the efficiency of the system.

The finding suggests that the system delivers a consistent level of performance and functionality across users with varying lengths of experience. The absence of significant differences implies that both new and long-term users are able to utilize the system effectively, reflecting its ease of use, accessibility, and stable operational features. Such consistency may indicate that the Automated School Management System is designed in a manner that supports user adaptation regardless of duration of utilization.

This result is supported by the study of Hadi et al. (2022), which found that user satisfaction with education management information systems is primarily influenced by system quality and information quality rather than the length of system exposure. Likewise, Saputri and Mulyani (2022) reported that the effectiveness of academic information systems is associated with system functionality and service delivery, which can be experienced similarly by users regardless of their years of usage. Furthermore, Hendrawan et al. (2025) observed that school management information systems with acceptable usability levels tend to provide comparable user experiences among stakeholders with different backgrounds and levels of system familiarity.

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

This chapter summarizes the major findings of the study, articulates the conclusions derived from the results, and formulates practical recommendations grounded in the significant outcomes.

Summary of Findings

The following is a summarized outline of the relevant findings and observed outcomes derived directly from this study:

- Faculty members constituted the largest group of respondents ($f = 150$, 75.00%), and had been using the system for 5 years and above ($f = 91$, 45.50%), followed by 3–4 years ($f = 74$, 37.00%), 1–2 years of utilization ($f = 33$, 16.50%), and less than 1 year ($f = 2$, 1.00%). This distribution suggests that the respondents possessed varying levels of familiarity with the system, allowing for a comprehensive assessment of its efficiency across both experienced and relatively new users.
- The results revealed that the Automated School Management System attained an overall mean rating of 4.01 (SD = 0.63), interpreted as efficient. Among the assessed dimensions, usability obtained the highest rating ($M = 4.23$, SD = 0.72), interpreted as highly efficient. Similarly, accessibility received an efficient rating ($M = 4.06$, SD = 0.68), suggesting that users can conveniently access system functions, information, and services across various devices and operational settings, while system quality recorded the lowest mean among the evaluated dimensions, although it remained within the efficient category ($M = 3.69$, SD = 0.65).
- The Automated School Management System efficiency has no significant difference across various respondent category and length of system utilization ($H = 7.909$, $p = .161$; $H = 0.207$, $p = .976$).

Conclusions

From the synthesized findings of this study, the following conclusions are systematically derived:

- The respondents were primarily composed of faculty members, with representation from various administrative offices and academic units. Moreover, the participants possessed varying lengths of system utilization, indicating that both experienced and relatively new users thereby providing a comprehensive evaluation of the system's efficiency.
- The Automated School Management System effectively facilitates institutional processes and meets users' operational requirements, indicating its value as an essential tool for school management. The system exhibited particular strengths in usability, information quality, reliability, accessibility, and service quality. Users can efficiently navigate the system, access accurate and relevant information, perform necessary tasks with confidence, and receive adequate technical support when needed.
- The efficiency of the Automated School Management System was perceived consistently across different respondent categories and length of system utilization.

Recommendations

In view of the study's findings and derived conclusions, the following actionable recommendations are advanced for consideration and implementation by organizational leadership:

- The college administration may institutionalize a data-driven monitoring and evaluation framework for the Automated School Management System to ensure its continuous alignment with institutional goals and user requirements. It may also allocate resources for periodic system enhancement initiatives that can sustain operational efficiency and support digital transformation efforts. Moreover, the institution may establish a collaborative innovation committee composed of administrators, technical personnel, faculty members, and student representatives to periodically evaluate system performance and recommend user-centered improvements. Such a mechanism can promote shared ownership and continuous system refinement.
- Information technology personnel may implement predictive maintenance practices and user-feedback analytics to proactively identify system concerns and improvement opportunities. They can also strengthen system infrastructure and security measures to further improve performance, availability, and reliability.

- Academic offices may regularly review workflow processes integrated within the system and identify areas where automation can further reduce administrative burden. They can also establish standardized digital procedures that may improve service consistency and operational efficiency across academic units.
- Faculty members may maximize the advanced features of the system through continuous capability-building activities and professional development programs. They can also provide periodic feedback regarding system functionality to support evidence-based enhancements in academic management processes.
- Students may actively utilize available system services and participate in user-satisfaction assessments to help identify emerging needs and usability concerns. Their feedback can contribute to the development of more responsive and learner-centered digital services.
- Future researchers may examine additional factors influencing the effectiveness of school management systems, such as user engagement, digital competence, organizational readiness, and technology acceptance. They can also conduct comparative or longitudinal studies to generate deeper insights into the sustainability and long-term impact of educational management technologies.

REFERENCES

Books

1. Bertalanffy, L. von. (1968). General system theory: Foundations, development, applications. George Braziller.
2. Bhattacharjee, A. (2021). Social science research: Principles, methods, and practices (3rd ed.). University of South Florida.
3. Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches (6th ed.). SAGE Publications.
4. Commission on Higher Education. (2024). Policies, standards, and guidelines governing higher education institutions in the Philippines.
5. International Organization for Standardization. (2024). ISO 9241-11:2024 ergonomics of human-system interaction—Usability: Definitions and concepts. ISO.
6. Laudon, K. C., & Laudon, J. P. (2022). Management information systems: Managing the digital firm (17th ed.). Pearson.
7. O'Brien, J. A., & Marakas, G. M. (2022). Management information systems (12th ed.). McGraw-Hill Education.
8. Stair, R. M., & Reynolds, G. W. (2021). Principles of information systems (14th ed.). Cengage Learning.

Journal/Publication/Articles/Magazine

1. Adhikari, N. P., Budhathoki, J. K., & Adhikari, S. (2024). Management information systems' role and effects on school administration: A review. *Perspectives on Higher Education*, 14(1), 81–94. <https://doi.org/10.3126/phe.v14i1.7656>
2. Akrong, G. B., Shao, Y., & Owusu, E. (2021). Assessing the impact of system quality, information quality, and service quality on enterprise resource planning (ERP) systems. *International Journal of Enterprise Information Systems*, 17(4). <https://doi.org/10.4018/IJEIS.2021100104>
3. Akrong, G. B., Shao, Y., & Owusu, E. (2023). Evaluation of the quality constructs of a tax management system based on DeLone and McLean IS success model. *Africa Journal of Management*, 9(1), 46–69. <https://doi.org/10.1080/23322373.2022.2155116>
4. Akwene, G. C. (2024). Adoption of learning management systems in higher education: A qualitative analysis of enabling factors. *International Journal of Scientific Research and Management*, 12(2), 3229–3237. <https://doi.org/10.18535/ijserm/v12i02.el09>
5. Al Naqbi, S. H. (2024). A mixed-method approach to post-implementation success of technology performance in UAE universities: Assessing DeLone and McLean IS success model. *SAGE Open*, 14(2). <https://doi.org/10.1177/21582440241240827>
6. Alanezi, A. (2021). Obstacles to applying electronic school management in Kuwait. *Research in Education*, 109(1), 54–69. <https://doi.org/10.1177/0034523719895042>

7. Al-Emran, M., Mezhyuev, V., Alzahrani, A., & Alhashmi, M. (2023). The role of usability factors in educational information systems adoption: A systematic review. *Education and Information Technologies*, 28(4), 4211–4232. <https://doi.org/10.1007/s10639-022-11326-4>
8. Alfaki, I. A. (2021). DeLone and McLean information systems success model in a blended-learning context. *International Journal of Information and Communication Technology Education*, 17(4). <https://doi.org/10.4018/IJICTE.20211001.0a18>
9. Al-Fraihat, D., Joy, M., Masa'deh, R., & Sinclair, J. (2021). Evaluating e-learning systems success: An empirical study. *Computers in Human Behavior*, 102, 67–86. <https://doi.org/10.1016/j.chb.2019.08.00>
10. Al-Hunaiyyan, A., Alhajri, R., Alghannam, B., & Al-Shaher, A. (2021). Student information system: Investigating user experience (UX). *International Journal of Advanced Computer Science and Applications*, 12(2). <https://doi.org/10.14569/IJACSA.2021.0120210>
11. Almaiah, M. A., Al-Khasawneh, A., Althunibat, A., & Alqudah, A. (2023). Exploring the critical challenges and factors influencing the successful implementation of e-learning systems in higher education institutions. *Education and Information Technologies*, 28(4), 4321–4343. <https://doi.org/10.1007/s10639-022-11354-7>
12. 22. Almaiah, M. A., Hajjej, F., Lutfi, A., Al-Khasawneh, A., Shehab, R., & Alkhdour, T. (2022). Explaining the factors affecting students' acceptance of mobile learning applications. *Education and Information Technologies*, 27(3), 1–23. <https://doi.org/10.1007/s10639-021-10734-8>
13. Al-Rahmi, W. M., Yahaya, N., Alturki, U., Aldraiweesh, A., Almutairy, S., Al-Adwan, A. S., & Kamin, Y. B. (2022). Acceptance of mobile learning for higher education students: A structural equation modeling approach. *Education and Information Technologies*, 27(7), 9355–9378. <https://doi.org/10.1007/s10639-022-10986-z>
14. Alsyouf, A., Alrawashdeh, N., Albahussain, S., Alharbi, M., & Alshorman, M. (2022). Factors affecting the success of information systems and user trust. *Sustainability*, 14(9), 5467. <https://doi.org/10.3390/su14095467>
15. Alzahrani, L., & Seth, K. P. (2021). Factors influencing students' satisfaction with continuous use of learning management systems during the COVID-19 pandemic: An empirical study. *Education and Information Technologies*, 26, 6787–6805. <https://doi.org/10.1007/s10639-021-10492-5>
16. Asio, J. M. R., Leva, E. F., Lucero, L. C., & Cabrera, W. C. (2022). Education Management Information System (EMIS) and its implications to educational policy: A mini-review. *International Journal of Multidisciplinary: Applied Business and Education Research*, 3(8), 1389–1398. <https://doi.org/10.11594/ijmaber.03.08.01>
17. Azeroual, O., Schöpfel, J., & Saake, G. (2021). Implementation and user acceptance of research information systems. *Program*, 55(6), 1165–1182. <https://doi.org/10.1108/PROG-01-2021-0018>
18. Benitez, I. P., & Serrano, P. A. (2021). SIGSv2: Enhanced student ID generator and management system. In *Lecture Notes in Networks and Systems*, 154, 765–774. Springer. https://doi.org/10.1007/978-981-15-8354-4_75
19. Bhutoria, A., & Aljabri, N. (2022). Managerial practices and school efficiency: A data envelopment analysis across OECD and MENA countries using TIMSS 2019 data. *Large-scale Assessments in Education*, 10(24). <https://doi.org/10.1186/s40536-022-00147-3>
20. Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M. (2021). Mapping research in student engagement and educational technology. *Educational Technology Research and Development*, 69(2), 1–29. <https://doi.org/10.1007/s11423-021-09986-1>
21. Botelho, F. H. F. (2021). Accessibility to digital technology: Virtual barriers, real opportunities. *Assistive Technology*, 35(1), 27–34. <https://doi.org/10.1080/10400435.2021.1945705>
22. Brombuela, G., Estacio, D. L., & Jingco, F. G. A. (2021). The impact of management information system on teachers of an HEI in City of Malolos, Bulacan, Philippines. *International Journal of Scientific Research and Engineering Development*, 4(4), 940–948.
23. Cabacang, G. S. (2021). Quality is never an accident: A survey on the total quality-management practices amongst selected higher education institutions in the Philippines. *International Journal of Learning, Teaching and Educational Research*, 20(10), 23–41. <https://doi.org/10.26803/ijlter.20.10.2>
24. Çelik, K., & Ayaz, A. (2022). Validation of the DeLone and McLean information systems success model: A study on student information system. *Education and Information Technologies*, 27, 4709–4731. <https://doi.org/10.1007/s10639-021-10798-4>

25. Daim, T., Gungor, D. O., Basoglu, N., Yarga, A., & VanDerSchaaf, H. (2024). Exploring student information management system adoption post pandemic: Case of Turkish higher education. *Technology in Society*, 77, 102557. <https://doi.org/10.1016/j.techsoc.2024.102557>
26. Damayanto, A., Hardiansyah, A., & Mayasari, A. R. (2025). School management automation: Analyzing the impact of management information systems on the effectiveness of the learning process. *International Journal of Teaching and Learning*.
27. Danso, L. A., Adjei, J. K., Yaokumah, W., et al. (2021). EMIS success modeling using information systems quality factors. *International Journal of Information Systems in the Service Sector*, 13(3), 65–81. <https://doi.org/10.4018/IJISSS.2021070105>
28. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–340. <https://doi.org/10.2307/249008>
29. DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9–30.
30. Elmunsyah, H., Nafalski, A., Wibawa, A. P., & Dwiyanto, F. A. (2023). Understanding the impact of a learning management system using a novel modified DeLone and McLean model. *Education Sciences*, 13(3), 235. <https://doi.org/10.3390/educsci13030235>
31. Gormantara, A., & Elisabeth, E. (2023). Evaluation of the success of the academic information system (SIAMIK) with the DeLone and McLean model. *Jurnal Teknologi Informasi dan Pendidikan*, 15(2). <https://doi.org/10.24036/jtip.v15i2.666>
32. Grepon, B. G. S., Baran, N. T., Gumonan, K. M. V. C., Martinez, A. L. M., & Lacs, M. L. E. (2021). Designing and implementing e-school systems: An information systems approach to school management of a community college in Northern Mindanao, Philippines. *International Journal of Computing Sciences Research*. <https://doi.org/10.25147/ijcsr.2017.001.1.74>
33. Gurendrawati, E., Sasmi, A. A., Ulupui, I. G. K. A., Murdayanti, Y., Anwar, C., & Wahyuningsih, I. T. (2022). The DeLone and McLean model on user satisfaction of academic service systems. *Jurnal Pendidikan Ekonomi dan Bisnis*, 10(1), 87–99. <https://doi.org/10.21009/JPEB.010.1.8>
34. Hadi, S., Wijaya, W. M., Suharyadi, A., Hassan, A., & Zaki, C. N. F. M. (2022). The determinant factors on user satisfaction in assessing the quality of online education management information system. *Advances in Social Science, Education and Humanities Research*. https://doi.org/10.2991/978-2-494069-67-1_13
35. Haleem, A., Javaid, M., Qadri, M. A., & Suman, R. (2022). Understanding the role of digital technologies in education. *Sustainable Operations and Computers*, 3, 275–285. <https://doi.org/10.1016/j.susoc.2022.05.004>
36. Hart, D. (2021). Conceptualizing the systemic evaluation of dashboards in quality enhancement processes in higher education. *Systems Research and Behavioral Science*, 38(6), 817–832. <https://doi.org/10.1002/sres.2736>
37. Haryanto, E. (2023). Peran sistem informasi manajemen peserta didik dalam optimalisasi efisiensi kerja bidang kesiswaan. *Global Education Journal*, 1(2). <https://doi.org/10.59525/gej.v1i2.285>
38. Helal, M. S. A., Ahmed, I., & Bhuiyan, M. E. M. (2021). Impact of Education Management Information System (EMIS) on teaching-learning development. *International Journal of Academic Research in Progressive Education and Development*, 10(2).
39. Hendrawan, J., Perwitasari, I. D., Yusman, Y., & Felawati, F. (2025). Usability assessment of school management information systems: A case study on tuition payment data monitoring. *Proceedings of International Conference on Islamic Community Studies*.
40. Iqbal, M., & Rafiq, M. (2023). DeLone and McLean's reformulated information systems success model: A systematic review of available literature in public sector (2011–2022). *Global Knowledge, Memory and Communication*. <https://doi.org/10.1108/GKMC-07-2022-0162>
41. Karovska Ristovska, A., Rashikj-Canevska, O., Tasevska, A., Bruziene, R., Orechova, M., Paiva Dias, G., Brito, E., & Haubro, H. (2021). Accessible learning management systems: Students' experiences and insights. *Prizren Social Science Journal*, 5(2), 1–13. <https://doi.org/10.32936/pssj.v5i2.224>
42. Kuo, F.-H. (2021). An investigation of the operational efficiency of school management through innovative teaching via digital mobile e-learning: DEA and data mining methodology. *Advances in Decision Sciences*, 11(1). <https://doi.org/10.47654/v11y2021i1p1-30>

43. Kuppusamy, K. S., & Balaji, V. (2021). Evaluating web accessibility of educational institutions websites using a variable magnitude approach. *Universal Access in the Information Society*, 22, 241–250. <https://doi.org/10.1007/s10209-021-00812-4>
44. Kwarteng, M. A., Baah, P., & Mensah, I. K. (2022). Information quality and user satisfaction in information systems: Evidence from educational institutions. *Information Development*, 38(4), 625–638. <https://doi.org/10.1177/02666669211010941>
45. Lating, A., Lating, F. A., Sugiono, D., & Liana, Y. (2021). Determinants of user satisfaction with academic information systems. *Akuntansi Bisnis & Manajemen*, 28(2), 61–68. <https://doi.org/10.35606/jabm.v28i2.931>
46. Liu, H.-H., & Kuo, F.-H. (2021). Investigating the school characteristics/attributes via the relationships between school management efficiency and representative factors of mobile e-learning: DEA and data mining methodology. *Journal of Information and Optimization Sciences*, 42(4), 883–907. <https://doi.org/10.1080/02522667.2021.1909220>
47. Magtoto, C. R. M., Abulencia, C. C., Borlongan, C. G., & De Guia, D. J. (2022). Role of school management information system on school operations and administrative decision-making. *International Journal of Academic Pedagogical Research*, 6(7), 155–163.
48. Marumpe, D. P., Yulindisti, E., Hafiidz, Z. M., Rahmasari, N. A., & Yosefin, E. (2025). Evaluating SEVIMA academic system effectiveness in managing lecturer performance through the DeLone–McLean information success model. *Ilomata International Journal of Management*, 7(2). <https://doi.org/10.61194/ijjm.v7i2.2023>
49. Melgis, S. A., Aryani, R., Lestari, D., & Abdalnazar, M. N. (2024). Analyzing the quality of academic information systems on system success. *INTENSIF: Jurnal Ilmiah Penelitian dan Penerapan Teknologi Sistem Informasi*, 8(1). <https://doi.org/10.29407/intensif.v8i1.21512>
50. Mintah, S., Dorsah, E., Arkorful, V., & Lumadi, R. I. (2024). Mixed method study of stakeholders' perspectives toward the newly introduced students' information system at the senior high school level. *International Journal of Research and Innovation in Social Science*, 8(6), 2235–2253. <https://doi.org/10.47772/IJRISS.2024.806168>
51. Mitschek, M., Sanares, R. N., Del Rosario, M. G., & Doctor, J. (2024). Effectiveness and stakeholders' perception of the student information system integration in higher education institution. *Journal of Innovations in Business and Industry*, 2(4), 199–206. <https://doi.org/10.61552/JIBI.2024.04.002>
52. Mtebe, J. S., & Raisamo, R. (2022). Investigating students' and instructors' behavioral intention to adopt and use learning management systems in higher education. *Education and Information Technologies*, 27(5), 6749–6769. <https://doi.org/10.1007/s10639-021-10886-0>
53. Naparan, G. B., & Tulod, R. G. (2021). Time management strategies of school administrators towards effective administration: A phenomenological study. *The New Educational Review*, 63(1), 59–70. <https://doi.org/10.15804/tner.21.63.1.05>
54. Nguyen, T. T., Nguyen, H. T., & Cao, T. H. (2021). Information quality and user satisfaction in educational management systems. *Education and Information Technologies*, 26(5), 5671–5689. <https://doi.org/10.1007/s10639-021-10521-5>
55. Nugraheni, D. M. K., & Bayastura, S. F. (2021). Analysis of factors that influence satisfaction and usefulness for attendance system with the DeLone & McLean model (Case study: Attendance system at Diponegoro University). *Journal of Physics: Conference Series*, 1943(1), 012108. <https://doi.org/10.1088/1742-6596/1943/1/012108>
56. Pradana, R. M., Sasongko, D. P., Puspitasari, E. M., Wardhani, Y. F., Kristanto, A., & Trihantoyo, S. (2026). Management information systems and the efficiency of elementary school administration: A literature review based on evidence-based research on integrated systems. *Sekolah Dasar: Kajian Teori dan Praktik Pendidikan*, 35(1), 87–99.
57. Rachmat, A., Hamzah, B., & Niswar, M. (2022). Evaluation of academic information system using DeLone and McLean success model: A case study of Academic Information System Hasanuddin University. *Jurnal Sistem Informasi*, 18(1), 62–75. <https://doi.org/10.21609/jsi.v18i1.1114>
58. Ramlan, I., & Rusdan, M. (2025). An evaluation of academic information system success at Widyatama University using the DeLone and McLean model. *Jurnal Sistem Informasi dan Teknologi Informasi*, 3(1). <https://doi.org/10.33197/justinfo.v3i1.3412>

59. Redoblo, C. V. (2021). Development of an online management system for institutional sustainability assessment. *Research Journal of Education, Science and Technology*, 1(1). <https://doi.org/10.63179/rjest.v1i1.5>
60. Rusnati, I., Gaffar, M. F., Komariah, A., Susilana, R., & Kurniady, D. A. (2021). The development and application of digitalized school management system. *Multicultural Education*, 7(6). <https://doi.org/10.5281/zenodo.5035855>
61. Saad, A., & Daud, E. D. (2020). The acceptance of an online Educational Management Information System (EMIS) among data and information teachers. *Journal of Information Systems and Digital Technologies*, 2(2), 1–17. <https://doi.org/10.31436/jisdt.v2i2.12>
62. Salloum, S. A., Alhamad, A. Q., Al-Emran, M., Monem, A. A., & Shaalan, K. (2023). The impact of system reliability and security on information systems success. *Applied Sciences*, 13(2), 1007. <https://doi.org/10.3390/app13021007>
63. Saputri, A., & Mulyani, E. (2022). The impact of academic information system to students' satisfaction in higher education. *Studies in Educational Management*, 12. <https://doi.org/10.32038/sem.2022.12.01>
64. Sharma, S., Dwivedi, Y. K., Rana, N. P., & Alalwan, A. A. (2022). Service quality and user satisfaction in digital systems: A comprehensive review. *International Journal of Information Management Data Insights*, 2(2), 100113. <https://doi.org/10.1016/j.jjime.2022.100113>
65. Sor, L. D. T. (2022). Project ASAP: Automated School Form 2 and 4 for its easy accomplishment per month in the new normal. *International Journal of Research in Engineering, Science and Management*, 5(7), 90–94.
66. Sunarjo, R. A., Chakim, M. H. R., Maulana, S., & Ijiis, G. F. (2025). Management of educational institutions through information systems for enhanced efficiency and decision-making. *International Transactions on Education Technology*, 3(1). <https://doi.org/10.33050/itee.v3i1.670>
67. Syahrul, Alifya, N. F. H., Dewi, S. S., & Anandari, D. R. (2025). Evaluating EduTrack system quality using ISO/IEC 25010 and the DeLone and McLean model. *Journal of Embedded Systems, Security and Intelligent Systems*, 6(3). <https://doi.org/10.59562/jessi.v6i3.10266>
68. Umaroh, S., & Barmawi, M. M. (2021). DeLone and McLean model of academic information system success. *Electrotehnica, Electronica, Automatica*, 69(2), 92–101. <https://doi.org/10.46904/eea.21.69.2.1108011>
69. Vera Mera, M. V. (2021). Evaluation of the quality of service of the academic system of the Technical University Luis Vargas Torres of Esmeraldas based on the DeLone and McLean model. *Visionario Digital*, 5(3), 53–69. <https://doi.org/10.33262/visionariodigital.v5i3.1747>
70. Villanueva, E. R. (2022). RSU web-based school automation management system: Results-based assessment. *Journal of Positive School Psychology*, 6(5), 8187–8199.
71. Widyaningrum, T., Sholihah, Q., & Haryono, B. S. (2024). The DeLone and McLean information system success model: Investigating user satisfaction in learning management system. *Journal of Education Technology*, 8(1). <https://doi.org/10.23887/jet.v8i1.71080>

Online Sources

1. Brombuela, G., Estacio, D. L., & Jingco, F. G. A. (2021). The impact of management information system on teachers of an HEI in City of Malolos, Bulacan, Philippines. <https://doi.org/10.48550/arXiv.2109.04791>
2. Ceniza, T. P. (2021). Experiences of secondary school heads in using learner information system (LIS) facility. <https://doi.org/10.13140/RG.2.2.22180.81284>
3. Grepon, B. G. S., Baran, N., Gumonan, K. M. V., et al. (2021). Designing and implementing e-school systems: An information systems approach to school management of a community college in Northern Mindanao, Philippines. <https://doi.org/10.48550/arXiv.2109.00198>