

MANAGEMENT AND UTILIZATION STRATEGIES OF EDUCATIONAL MANAGEMENT INFORMATION SYSTEMS TO ENHANCE STUDENTS' ACADEMIC PERFORMANCE

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Abstract. Conventional educational management systems often face limitations in handling student data, curriculum, and other academic processes, leading to difficulties in effectively monitoring and enhancing students' academic performance. With the rapid advancement of information technology, the use of management information systems in educational contexts has become increasingly crucial. This research aims to examine the management and utilization strategies of management information systems in enhancing students' academic performance. The methodology employed in this research is a literature review using a qualitative approach and descriptive analysis. Descriptive analysis is utilized to present characteristics, patterns, and trends emerging from data obtained from articles published on Google Scholar between 2007 and 2024. Theme identification is one of the research data analysis techniques. The main themes in the article were identified, focussing on aspects such as information systems, education management, and student academic performance. The study results indicate that the utilization of Management Information Systems (MIS) has demonstrated a significant role in enhancing efficiency and effectiveness across various fields, including education. In the educational context, the management of MIS can be a key factor in improving students' academic performance.

Keywords: Information Systems, Educational, Academic Performance

Abstrak Sistem manajemen pendidikan yang konvensional seringkali memiliki keterbatasan dalam mengelola data mahasiswa, kurikulum, dan proses akademik lainnya. Hal ini dapat menyebabkan kesulitan dalam memantau dan meningkatkan kinerja akademik mahasiswa secara efektif. Dengan pesatnya perkembangan teknologi informasi, penggunaan sistem informasi manajemen dalam konteks pendidikan telah menjadi semakin penting. Penelitian ini bertujuan untuk menelaah strategi pengelolaan dan pemanfaatan sistem informasi manajemen dalam meningkatkan kinerja akademik mahasiswa. Metode yang digunakan dalam penelitian ini adalah tinjauan pustaka dengan pendekatan kualitatif dan analisis deskriptif. Analisis deskriptif digunakan untuk menyajikan karakteristik, pola, dan tren yang muncul dari data yang diperoleh dari artikel-artikel yang dipublikasikan di Google Scholar antara tahun 2007 hingga 2024. Identifikasi tema merupakan salah satu teknik analisis data penelitian. Tema utama dalam artikel diidentifikasi, fokus pada aspek seperti sistem informasi, manajemen pendidikan, dan kinerja akademik mahasiswa. Hasil studi menunjukkan bahwa penggunaan Sistem Informasi Manajemen (SIM) telah membuktikan peran yang sangat penting dalam meningkatkan efisiensi dan efektivitas di berbagai bidang, termasuk pendidikan. Dalam konteks pendidikan, pengelolaan SIM dapat menjadi kunci dalam meningkatkan kinerja akademik mahasiswa.

Kata Kunci: Sistem Informasi, Pendidikan, Kinerja Akademik

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INTRODUCTION

The traditional education management system often faces challenges in the administration and management of student-related data, curriculum, and academic processes (Edgar R. Eslit, 2023). These limitations may hinder the ability to monitor academic performance of students accurately and improve it with optimal efficiency. Marked by rapid advancements in information technology, the implementation of management information systems in educational settings has shown increasing significance. These systems play a key role in providing efficient and measurable solutions in managing student data, conducting in-depth analysis of academic performance, and formulating appropriate strategies to enhance student achievement (P.Lajom, 2023). With the use of sophisticated analytical tools and robust data integration, these systems assist educational institutions in gaining deeper insights into their academic dynamics, which in turn aids in more effective and targeted decision-making to improve educational quality (Owan et al., 2023).

The current higher education context is characterized by increasingly fierce competition, both nationally and globally. In efforts to maintain relevance and excellence, educational institutions must consider the necessity of adopting appropriate and measurable information technology (Kamalov et al., 2023). The implementation of suitable information technology can be key to optimizing student academic performance, providing support in more efficient learning processes, and stimulating innovation in curriculum and teaching methodologies (Laurillard et al., 2009).

Assessing student academic performance is an integral aspect of educational management tasks. Through the application of appropriate management information systems, educational institutions are able to systematically conduct evaluations of student achievements and identify areas in need of improvement (Ilham & Yuniarti, 2022). By leveraging advanced technology and appropriate analytical tools, data on academic performance can be collected, processed, and evaluated holistically, providing deeper insights into student academic achievements and potential areas for improvement (Ifenthaler & Yau, 2020).

Data on student academic achievements not only serve as important assets but also as intellectual foundations for educational institutions. With adequate adoption of management information systems, institutions can collect, analyze, and interpret this data holistically (Kraus et al., 2021). In this context, data is not just a set of numbers but a concrete representation of student achievements and potentials, as well as indicators of curriculum effectiveness and teaching methods. Through integration of data from various sources and the use of sophisticated analytical algorithms, institutions can gain deep insights enabling evidence-based

and measurable decision-making (Mikalef et al., 2019). Optimal implementation of management information systems has the potential to have significant positive impacts on students directly (Shah, 2014). With infrastructure facilitating real-time performance monitoring, providing more personalized guidance, and easier access to various support resources, it is expected to boost motivation and enhance overall student academic performance (Haleem et al., 2022). In this context, management information systems serve not only as administrative tools but also as bridges connecting students with self-development opportunities and means to realize their academic potential more optimally.

Considering the points outlined above, this research aims to examine strategies for managing and utilizing management information systems to improve student academic performance. This becomes increasingly relevant and important as it enables effective monitoring of student academic progress, facilitates timely interventions when needed, and provides valuable insights through data analysis to identify patterns in student performance and potential areas for improvement.

METHOD

The method employed in this research is a literature review using a qualitative approach and descriptive analysis. The qualitative approach is utilized to gain an in-depth understanding of the concepts, theories, and findings related to management and utilization strategies of educational management information systems to enhance students' academic performance. In the qualitative approach, the primary focus of the research is on comprehending the context, processes, and meanings of the phenomena under study, as well as acquiring rich and profound insights through data interpretation. Descriptive analysis is employed to present characteristics, patterns, and trends emerging from data obtained from articles published on Google Scholar between 2007 and 2024. Initially, 66 articles were gathered, but after a rigorous selection process based on relevance and quality, 41 articles were chosen as the research sample. In selecting 41 articles from the initial 66, the researchers used a systematic and rigorous selection process with key criteria including relevance to the research topic, research quality, publication source, publication date, thematic appropriateness, diversity of perspectives, and removal of irrelevant or duplicate articles.

They prioritised articles that were directly related to management strategies and the utilisation of educational management information systems to improve student academic performance, by assessing methodological strength, author credibility, and relevance to the topic. In addition, articles from reliable and representative sources from various perspectives

were also given attention. The selection aims to present a collection of high-quality articles that provide in-depth insights into the research topic. The data analysis process involves in-depth reading of each selected article, identification of main themes, mapping of relationships among themes, and interpretation of meanings derived from these findings. The results of descriptive analysis will be utilized to provide a comprehensive overview of the current understanding regarding management and utilization strategies of educational management information systems and their impact on students' academic performance.

RESULTS

An information system is a structured set of procedures, methods, software, databases, and hardware that are interconnected and integrated with the purpose of collecting, storing, processing, and disseminating information needed to support the business operations, decision-making, and effective management of an organization (Alter, 2008). In the context of education, information systems form the technological foundation supporting the management of various aspects, including student data, curriculum, class schedules, and academic performance evaluation (Chakraborty & Mansor, 2013). Through efficient information systems, educational institutions can automate processes, improve data accessibility, and gain better insights into trends and patterns related to student performance (Qu et al., 2019). Thus, information systems serve not only as administrative tools but also as strategic tools supporting informed decision-making and overall educational quality enhancement (Heriyanto, 2022b; Heriyanto, Oktavianda, & Suprihartini, 2022).

Educational management refers to a series of planning, organizing, directing, and controlling processes within the context of educational institutions to achieve specific educational objectives (Karim et al., 2024). This includes policy-making, resource allocation, curriculum development, faculty management, as well as continuous monitoring and evaluation of performance. In the complex and dynamic educational environment, educational management aims to create an environment conducive to effective learning, optimize resource utilization, and enhance overall educational quality (Kurniawan et al., 2024). Educational management also considers strategic aspects such as the use of information technology, increasing stakeholder participation, and developing policies relevant to the dynamics of contemporary education (Almeida et al., 2021). Thus, educational management is not only about administration but also about vision development, innovation, and adaptation to changes in the field of education (Heriyanto, 2022a).

Students' academic performance refers to the achievements or accomplishments attained by students in academic aspects such as learning outcomes, grades, participation in academic activities, and involvement in research projects or scientific developments (Lamas, 2015). This includes assessment of understanding of subject matter, ability to apply learned concepts in practical situations, as well as progress in the development of relevant skills and competencies aligned with the program of study pursued. Academic performance may also encompass non-academic aspects such as participation in extracurricular activities, leadership inside and outside the classroom, and contributions to campus or community (Christison, 2013). Evaluation of students' academic performance is an integral part of the teaching and learning process in higher education institutions, and its outcomes often serve as key indicators in assessing their educational success. Therefore, students' academic performance serves as an important measure in evaluating the effectiveness of educational programs and provides insights into students' potential and achievements in both academic and professional contexts.

DISCUSSION

In an era where technology is increasingly becoming an integral part of everyday life, the use of Management Information Systems (MIS) has become key in enhancing efficiency and effectiveness across various sectors, including education. Within the context of education, the management and utilization of Management Information Systems (MIS) play a crucial role in improving students' academic performance. Serving as a tool that facilitates data collection, management, and analysis, Management Information Systems (MIS) enable educational institutions to track individual academic progress, identify performance patterns, and develop appropriate intervention strategies (Nguyen et al., 2021). By optimally leveraging MIS, educational institutions can implement targeted and measurable approaches to enhance the quality of learning and academic achievement among students (Awan Setiawan et al., 2022). Thus, increasing the utilization of MIS in the educational context can be key to sustainable improvements in students' academic performance.

First and foremost, effective MIS management requires the implementation of a strong and systematic infrastructure, which is a crucial step in building a solid foundation for system success (Heriyanto, Lubis, et al., 2020). This process involves developing a platform capable of integrating and structuring various relevant student-related data, including but not limited to personal information, academic data, and performance records. Establishing this robust infrastructure not only secures reliable data storage but also provides the necessary foundation

for developing high-quality MIS management strategies oriented toward achieving desired academic goals (Barrett et al., 2019).

Furthermore, the utilization of MIS in enhancing students' academic performance can be achieved through various methods involving the development and implementation of advanced data analysis techniques. One approach that can be applied is through the utilization of sophisticated data analysis techniques such as machine learning and data mining, which can decipher large datasets into valuable insights. Leveraging the power of these algorithms, educational institutions can delve deeper into the complexity of student academic behavior data. For instance, analysis can focus on identifying patterns emerging in attendance, participation in extracurricular activities, or exam performance, thus enabling institutions to recognize factors significantly influencing students' academic performance. Implementing these advanced data analysis techniques provides opportunities for educational institutions to optimize the use of MIS in supporting efforts to enhance students' academic achievements (Baniata et al., 2024).

An additional strategic enhancement to expand the potential utilization of Management Information Systems (MIS) in improving learning effectiveness is its integration with e-learning systems. By merging MIS with e-learning platforms, educational institutions can broaden students' access to learning materials, complete assignments, and interact with instructors and peers (Firman et al., 2021). This integration not only promotes flexibility in the learning process but also generates deeper insights into students' interactions with learning materials. With this integration, educational institutions can create a more dynamic learning environment focused on individual student needs, while also providing opportunities for the development of more adaptive and responsive learning approaches to current technological advancements and learning needs (Heriyanto, Debbie Yuari Siallagan, et al., 2020).

In the next phase, it is essential to utilize Management Information Systems (MIS) as a means to facilitate effective communication among students, faculty, and administration. Seamless integration within this information system enables the creation of smoother communication channels, encompassing various media such as text messages, emails, or other collaborative platforms (Riemer & Fröbner, 2007). This paves the way for students to obtain the necessary assistance and support in their academic journey more easily, whether it be obtaining information, clarifying inquiries, or seeking guidance from instructors or administrative staff. Through this integrated communication facility, educational institutions can strengthen connections among various stakeholders involved in the learning process,

accelerate responses to students' needs, and promote productive collaboration in achieving desired educational goals.

Not only important but crucial is the implementation of Management Information Systems (MIS) for the purpose of monitoring and evaluating students' academic performance periodically. By providing easy access to academic performance data for both students and faculty, educational institutions can proactively identify students in need of additional assistance or academic intervention (Yağcı, 2022). With this capability, institutions can respond to students' needs more quickly and effectively, enabling targeted and focused coaching and guidance efforts. Furthermore, MIS integrated with sophisticated data analysis tools also enables institutions to identify trends and patterns in academic performance more holistically, opening opportunities for the development of more targeted and sustainable intervention strategies. The use of MIS as a tool for monitoring and evaluating academic performance paves the way for the transformation of more adaptive and responsive educational approaches to individual student needs (George & Wooden, 2023).

On the other hand, to enhance the utilization of Management Information Systems (MIS) in supporting the improvement of students' academic performance, it is essential to conduct regular evaluation and development of the system. Educational institutions are required to maintain consistency in monitoring technological advancements and best practices in MIS management, while proactively listening to feedback from students and faculty. Through ongoing evaluations of MIS effectiveness, institutions can identify areas needing improvement or adjustment, thus allowing for better refinement in technology implementation. Additionally, by accommodating input from key stakeholders, institutions can ensure that MIS serves not only as an administrative tool but also as a relevant and beneficial support tool for the entire academic community (Mjlae, 2020). Continuous evaluation and development practices form the foundation for continuous improvement in MIS utilization, which in turn can contribute to overall improvements in education quality and students' academic achievements (Yurkofsky et al., 2020).

In essence, the management and utilization of Management Information Systems (MIS) in enhancing students' academic performance require a comprehensive and integrated approach that encompasses various aspects of the educational process. Through the implementation of carefully designed and effectively applied strategies, educational institutions can create a more inclusive and adaptive learning environment, enabling more meaningful and utilitarian learning experiences for students. Moreover, by ensuring that MIS is well integrated into various educational and administrative activities, institutions can provide stronger support for holistic

student academic success, including the development of non-academic skills and career readiness. Therefore, it is crucial for educational institutions to adopt a holistic and integrated approach in leveraging MIS, which will contribute to improvements in education quality and students' academic achievements overall.

It is important to emphasize that managing Management Information Systems (MIS) in the educational context goes beyond mere technological aspects; it is closely related to institutional policies and existing culture. Therefore, one essential strategy to be implemented is to ensure strong adoption and support from all stakeholders, ranging from institutional leadership to faculty, administrative staff, and of course, students. In efforts to strengthen acceptance and implementation of MIS, it is important to develop comprehensive training programs involving the entire educational community in the process. Active involvement from all parties not only creates greater awareness of MIS benefits but also builds the necessary skills for effective usage. Furthermore, strong support from institutional leadership provides a solid foundation for comprehensive MIS implementation in educational activities. By strengthening the commitment and participation of the entire educational community, institutions can ensure that MIS becomes a useful and relevant tool in supporting quality and sustainable educational goals (Camilleri & Camilleri, 2020).

In the context of managing Management Information Systems (MIS) to enhance students' academic performance, the aspects of data security and privacy become important focal points that cannot be ignored. Educational institutions are required to ensure that student data is managed with high security standards and compliance with relevant privacy regulations, such as the General Data Protection Regulation (GDPR) or relevant local regulations. Strong data protection measures, such as data encryption, multi-factor authentication, and the use of trusted security protocols, not only maintain the confidentiality of students' personal information but also strengthen their trust in the institution (Heriyanto, Oktavianda, & Sihombing, 2022); (Weippl & Schrittwieser, 2024). Moreover, awareness of the importance of data security also prompts institutions to develop clear policies and procedures regarding data management and usage, as well as conducting regular training for relevant personnel (Khando et al., 2021). Thus, implementing comprehensive data security measures not only serves as a proactive step in protecting students' privacy but also becomes a critical factor in ensuring the smoothness and success of technology-based learning processes.

Alongside these developments, the integration of Management Information Systems (MIS) with educational evaluation and quality assurance systems becomes an essential strategy in optimizing the educational process. By utilizing MIS to gather structured data on students'

academic performance, educational institutions gain access to rich sources of insight regarding program effectiveness and learning activities. This data forms a solid foundation for deeper evaluation processes, enabling the identification of performance patterns and challenges faced by students in their academic journey. By understanding students' characteristics and needs more holistically, institutions can design more adaptive and responsive learning strategies (Suranto & Pramitasari, 2024). Furthermore, integrating MIS with educational evaluation and quality assurance systems allows institutions to measure the real impact of learning initiatives and formulate policies oriented toward overall education quality improvement (Chen & Mohamed Mokhtar, 2023). Thus, the integration of MIS with educational evaluation and quality assurance systems not only enriches decision-making processes but also opens opportunities for the creation of a more adaptive and inclusive learning environment for all students.

In addition to the aforementioned aspects, it's important to emphasize efforts to enhance digital literacy for both students and faculty in the use of Management Information Systems (MIS). Educational institutions play a crucial role in providing adequate training and technical support, ensuring that all stakeholders can optimize the potential of MIS comprehensively. Thus, expanding digital skills for students and faculty is key in preparing them to face the increasingly complex learning challenges in this digital era. Through structured training and ongoing technical support, institutions can help students and faculty understand and master various features and functions offered by MIS (Yusuf Mesuwini, 2022). This not only enables them to interact more efficiently with digital learning platforms and tools but also provides a solid foundation for using technology as a useful support tool in the learning process. With increased digital literacy, students and faculty will be better prepared and skilled in addressing the changes and challenges associated with learning in this digital era, and able to derive maximum benefits from the various possibilities offered by MIS (Stoumpos et al., 2023).

In the final stage, in the context of managing and utilizing Management Information Systems (MIS) to enhance students' academic performance, it's important to carefully consider the principles of inclusion and accessibility as primary foundations. The design and implementation of information systems should take into account the diverse needs of students with different backgrounds and abilities, including those who may face challenges in terms of accessibility or technological limitations. Through this approach, educational institutions aim to ensure that all students, without exception, have equal access and are able to utilize the resources provided by MIS to support their learning process. Concrete steps, such as providing user-friendly accessibility options in platform design, providing appropriate technical support,

and developing inclusive policies, are essential in ensuring that no student is left behind or feels unsupported in their academic journey. Thus, educational institutions are committed to creating an inclusive and fair learning environment for all students, in line with the principles of equality and justice in higher education (Gill & Singh, 2020).

With the comprehensive adoption and implementation of various strategies mentioned, educational institutions have the opportunity to realize the full potential in managing and utilizing Management Information Systems (MIS) to enhance students' academic performance. More than just a technological tool, MIS becomes a strong foundation for building better, more inclusive, and responsive learning experiences tailored to individual student needs. Through the comprehensive implementation of these strategies, institutions can achieve various goals, from improving administrative efficiency to strengthening interactions and connections between students and faculty. Moreover, by prioritizing aspects such as digital literacy, data security, and inclusion, educational institutions can create a learning environment that enables every student to reach their academic potential without barriers. Thus, the management and utilization of MIS are not only technological instruments but also embody the institution's commitment to providing quality and equitable education for all students.

CONCLUSION

In an era where technology is increasingly becoming an important part of everyday life, the use of Management Information Systems (MIS) has proven itself as the key to improving efficiency and effectiveness in various fields, including education. In the context of education, the management and utilisation of MIS has a very important role in improving students' academic performance. Through MIS, educational institutions can track individual academic progress, identify patterns of achievement, and develop appropriate intervention strategies. With optimal utilisation, MIS can be the key to continuous improvement in student academic performance. Therefore, the management and utilisation of MIS needs to be comprehensively addressed, including robust infrastructure, utilisation of advanced data analysis techniques, integration with online learning systems, facilitation of effective communication, regular monitoring and evaluation of performance, data security, integration with education quality evaluation systems, enhancement of digital literacy, and aspects of inclusion and accessibility. By paying attention to all these aspects, educational institutions can create a more inclusive, adaptive and responsive learning environment for all students.

RECOMMENDATIONS

Suggestions that can be given on the results of this study include: 1) Implementation of Sturdy Infrastructure: Educational institutions need to develop a robust and systematic MIS infrastructure to support effective student data management. 2) Utilisation of Advanced Data Analytics: Use data analysis techniques such as machine learning and data mining to identify patterns in students' academic behaviour and factors that affect their performance. 3) Integration with Online Learning Systems: Integrate MIS with online learning platforms to facilitate access to learning materials and interaction between students, lecturers, and learning materials. 4) Facilitate Communication and Support: Use MIS to facilitate seamless communication between students, lecturers and administration, so that help and support can be provided in a timely manner. 5) Periodic Monitoring and Evaluation: Conduct regular monitoring and evaluation of students' academic performance using the data available in MIS, so that interventions can be made in a timely manner. 6) System Evaluation and Development: Continue to evaluate and develop the MIS system periodically in line with technological developments and feedback from users. 7) Data Security and Privacy Policy: Ensure the security and privacy of student data in MIS management in accordance with applicable privacy regulations. 8) Integration with Evaluation and Quality Assurance System: Integrate MIS with education evaluation and quality assurance systems to improve the effectiveness of learning programmes and activities. 9) Digital Literacy Training: Provide adequate training and technical support to improve students' and lecturers' digital literacy in using MIS. 10) Principles of Inclusion and Accessibility: Design MIS to take into account the needs of students with different backgrounds and accessibility or technological challenges. By comprehensively implementing the above suggestions, educational institutions can optimise the management and utilisation of MIS to improve students' academic performance and provide a better, more inclusive and responsive learning experience.

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