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Development of a Computer-Based Information System at SMA Negeri 1 Lawe Sigala-gala

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ABSTRACT

Information systems (IS) are critical for the effective management of educational institutions. This study develops a computer-based information system (CBIS) at SMA Negeri 1 Lawe Sigala-gala to improve data management, administrative efficiency, and decision-making. The system integrates student, teacher, curriculum, and financial data into a centralized platform, supporting planning, organizing, leadership, and control functions. Feedback from teachers, staff, and students shows increased operational efficiency, reduced manual workload, and improved digital literacy. This research contributes to understanding the practical implementation of IS in schools under regional autonomy and provides recommendations for future improvements.

INTRODUCTION

Schools are organizations that require effective management to achieve educational goals. Management in schools involves four interdependent functions: planning, organizing, leadership, and control. These functions rely heavily on accurate and timely information. Without a structured flow of information, schools face inefficiencies, delays in decision-making, and challenges in responding to changes in the educational environment (Laudon & Laudon, 2020; Turban et al., 2018).

The increasing challenges of globalization have intensified the need for schools to adopt modern approaches in managing their activities. Schools now compete not only at the local or national level but also globally, with educational standards, teaching methods, and governance benchmarked against international practices. Effective information management is therefore crucial to ensure transparency, accountability, and competitiveness (Ward & Peppard, 2016).

In Indonesia, regional autonomy has granted schools greater responsibility in managing resources and development strategies. This decentralization emphasizes the need for efficient information systems to support teaching, administrative processes, reporting, and communication with stakeholders, including parents and local authorities (Wahyudi, 2018). Despite these demands, SMA Negeri 1 Lawe Sigala-gala still relies heavily on manual administrative processes, leading to data overlaps, reporting inaccuracies, and inefficiencies that can hinder school performance.

The integration of computer-based information systems (CBIS) offers solutions to these challenges. CBIS can streamline administrative processes, reduce bureaucracy, improve data accuracy, and facilitate timely decision-making (O'Brien & Marakas, 2011; Murwono, 1994). Furthermore, CBIS exposes students to digital tools, fostering digital literacy and preparing them for the modern workforce.

While studies have examined the general benefits of IS in education, there is limited empirical evidence on the development and implementation of CBIS in regional Indonesian high schools. This study addresses this gap by designing and implementing a CBIS at SMA Negeri 1 Lawe Sigala-gala to enhance management efficiency and support sustainable school development.

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In summary, the adoption of a CBIS is no longer optional but necessary for schools to remain competitive, transparent, and professional in the era of regional autonomy and globalized education.

METHOD

This study employs a development research (research and development, R&D) design aimed at designing, implementing, and evaluating a computer-based information system (CBIS) at SMA Negeri 1 Lawe Sigala-gala. The research focuses on creating a functional system that supports managerial processes—planning, organizing, leadership, and control—and assesses its effectiveness in improving administrative and academic management. The population includes all administrative staff, teachers, and students at the school, with the evaluation focusing on 25 teachers and administrative staff for system usability and reporting efficiency tests, and 100 students to assess digital literacy benefits and system interaction.

Data were collected using multiple methods, including document review of student records, attendance sheets, class schedules, financial reports, and academic performance assessments. Observations of daily administrative processes were conducted to identify workflow bottlenecks, while questionnaires and interviews were used to evaluate user needs, system usability, and stakeholder satisfaction. The development of the CBIS follows four main stages: data collection and entry, data processing, information interpretation, and information distribution. At the data collection and entry stage, raw data are gathered from multiple sources and entered into the system via standardized digital forms to ensure accuracy and reliability. The data processing stage applies predefined procedures and algorithms to organize raw data into structured outputs, such as calculating averages, generating attendance summaries, and analyzing performance trends. During information interpretation, processed data are presented through tables, charts, and dashboards, highlighting key insights like student performance patterns, areas needing intervention, or teacher workload distribution. The information distribution stage ensures that outputs are shared with principals, teachers, administrative staff, students, and regional education authorities through digital dashboards on the school LAN, online platforms, or printed reports, ensuring transparency and stakeholder participation.

The system implementation utilizes a Local Area Network (LAN) for centralized data access, with MySQL as the database, a PHP-based interface for data management, and Microsoft Excel integration for reporting. Overall, by following this R&D approach, the CBIS serves as a reliable foundation for decision-making at SMA Negeri 1 Lawe Sigala-gala, streamlining information flow, reducing inefficiencies, enhancing data accuracy, and supporting both administrative and academic activities in a structured, modern, and sustainable manner.

RESULT AND DISCUSSION

The implementation of a computer-based information system (CBIS) at SMA Negeri 1 Lawe Sigala-gala has shown measurable improvements in school management and information flow. During the first three months after implementation, the system successfully integrated 1,200 student records, including attendance, grades, class schedules, and extracurricular activities. Prior to CBIS, generating monthly attendance and performance reports required 2–3 days manually, often leading to errors and delays. With the CBIS, administrative staff reported that reports could now be generated within 1–2 hours, demonstrating a significant increase in efficiency and accuracy.

Feedback from 25 teachers and administrative staff indicated that the system reduced manual workload and facilitated real-time access to student and teacher data. Teachers highlighted that monitoring student performance trends and identifying students needing remedial support became

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much faster and more accurate. Students (n=100) reported that interacting with the system enhanced their digital literacy, improved familiarity with IT tools, and encouraged self-monitoring of academic progress. These results align with studies that show CBIS adoption in schools improves administrative efficiency, accuracy of data management, and student engagement (Ward & Peppard, 2016; O'Brien & Marakas, 2011).

A comparative analysis with similar studies in Indonesian and global contexts reveals that schools implementing CBIS achieve higher operational efficiency and better decision-making outcomes. For instance, research by Wibowo (2017) indicated that schools using computer-based systems reduced redundancies and errors in student record management, similar to the findings in this study. However, SMA Negeri 1 Lawe Sigala-gala also demonstrates the added benefit of supporting regional autonomy policies, enabling transparent reporting to local education authorities and accountability in resource management.

The study also identified challenges during implementation. Some administrative staff initially resisted the transition from manual to computerized processes due to unfamiliarity with the system. Technical issues, such as minor database errors and network downtime, occurred during the first month. These challenges were mitigated through training sessions, continuous technical support, and the development of standardized data entry protocols. This highlights the importance of user readiness and ongoing support in CBIS adoption, consistent with prior findings in educational management research (Laudon & Laudon, 2020).

Moreover, the CBIS has a strategic impact on the four core managerial functions: planning, organizing, leadership, and control. Planning is enhanced by accurate historical and real-time data for scheduling and resource allocation. Organizing is supported through centralized data management, reducing overlaps and inconsistencies. Leadership is strengthened as principals and coordinators can monitor staff performance and academic outcomes effectively. Control processes benefit from transparent reporting and dashboards that provide actionable insights for timely interventions.

From an educational perspective, the CBIS contributes to student development by creating a digital learning environment, fostering technology use, information analysis, and accountability skills. These competencies are critical for preparing students to meet the demands of the 21st-century workforce, where digital literacy is increasingly valued. This dual benefit—operational efficiency and student development—demonstrates the broader value of CBIS in regional schools and adds to the literature on technology integration in education.

In conclusion, the implementation of a computer-based information system at SMA Negeri 1 Lawe Sigala-gala has successfully improved administrative efficiency, data accuracy, and decision-making, while also enhancing student digital competencies. The study confirms that CBIS is not merely a technical tool but a strategic infrastructure that supports sustainable school management, accountability, and professional growth. The findings contribute to both practice and research, providing a model for other schools in similar regional and educational contexts.

CONCLUSION

The implementation of a computer-based information system at SMA Negeri 1 Lawe Sigala-gala significantly improved data management, administrative efficiency, and digital literacy among students, supporting planning, organizing, leadership, and control functions while enabling transparent reporting to stakeholders. Practical recommendations include ongoing user training, periodic system updates, and integration with other digital learning tools to maximize system benefits. Although this study is limited to a single school and relies mainly on descriptive and user feedback data, which may affect generalizability, the findings demonstrate that CBIS serves as a

strategic tool for sustainable school management by enhancing operational efficiency, supporting student development, and ensuring the institution's competitiveness in the era of globalization, while future research should explore its long-term impact on academic performance, teacher efficiency, and school-wide management across multiple institutions.

REFERENCES

Budi Setejo. 2001. Perencanaan and pengembangan Sistem Informasi. Yogyakarta: Andi.

Iwan Sofana, "Cisco CCNA-CCNP Routing and Switching", Informatika, Bandung, 2017.

Laudon, K. C., & Laudon, J. P. (2020). Management information systems: Managing the digital firm (16th ed.). Pearson.

McLeod, R., & Schell, G. P. (2007). Management information systems (10th ed.). Pearson Prentice Hall.

Murwono, A. (1994). Pengantar teknologi informasi. Jakarta: Bumi Aksara.

O'Brien, J. A., & Marakas, G. M. (2011). Introduction to information systems (15th ed.). McGraw-Hill.

Raymond Mcleod, Jr.1995. sistem informasi manajemen. PT. Prentice Hall.

Stair, R., & Reynolds, G. (2021). Principles of information systems (14th ed.). Cengage Learning.

Sutejo, B. (2002). Sistem informasi manajemen. Yogyakarta: Andi Offset.

Turban, E., Pollard, C., & Wood, G. (2018). Information technology for management: On-demand strategies for performance, growth, and sustainability (11th ed.). Wiley.

Wahyudi, S. (2018). Sistem informasi manajemen pendidikan. Yogyakarta: Pustaka Pelajar.

Ward, J., & Peppard, J. (2016). The strategic management of information systems: Building a digital strategy (4th ed.). Wiley.

Wibowo, A. (2017). Sistem informasi dan implementasinya dalam pendidikan. Jakarta: Rajawali Pers.

Yuniartao Nurwono.1994. Manajemen informasi pendekatan Global Elex Media Komputindo.