

The Effect of Data Collection on Managerial Efficiency in Government Aided Secondary Schools in Mukono District

Ssebugwaawo Hakim¹, Matovu Musa², Nabukeera Madinah³, Ssali Muhammadi Bisaso⁴

¹Post graduate student, Department of Education Management and Administration, Faculty of Education, Islamic University in Uganda.

²Assoc.Prof. Dr., Department of Educational Psychology, Faculty of Education, Islamic University in Uganda.

³Assoc.Prof. Dr., Department of Public Administration, Faculty of Management Studies, Islamic University in Uganda.

⁴Senior lecturer., Department of Education Management and Administration, Faculty of Education, Islamic University in Uganda.

sbugwawohakiim@gmail.com

+256 782646077

Abstract

This study examined the effect of the various data collection practices on managerial efficiency in government-aided secondary schools in Mukono District, Uganda. A cross-sectional survey design was adopted, targeting 108 teachers and school administrators, from whom a sample of 84 respondents was determined using the Krejcie and Morgan sampling table. Data were collected using a structured questionnaire and an interview guide. Linear regression and content analysis were utilized in this study. The findings revealed a significant positive relationship between data collection and managerial efficiency ($R = 0.550$, $R^2 = 0.302$, $p < .001$), indicating that data collection explained 30.2% of the variation in managerial efficiency. Data collection significantly predicted managerial efficiency ($B = 0.581$, $\beta = 0.550$, $t = 6.774$, $p < .001$). At the dimensional level, data collection methods, data sources, and ethical considerations significantly influenced managerial efficiency, with ethical considerations having the strongest effect ($\beta = 0.485$), followed by methods ($\beta = 0.290$) and sources ($\beta = 0.207$). The study concluded that strengthening data collection systems, data quality, staff capacity, and ethical data practices could enhance managerial efficiency in schools.

Keywords: Data collection, data collection methods, data sources, ethical considerations, managerial efficiency.

Introduction

Managerial efficiency remains a major concern in schools globally, as administrators are expected to make timely and evidence-based decisions while managing limited resources, supervising staff, monitoring learners, and improving school performance. However, the increasing availability of educational data does not always translate into effective management. Lee et al. (2024) found that school context influences leaders' data-informed decision-making, while Mausethagen et al. (2019) emphasized that effective school leadership requires collaborative and consensus-oriented data use. Similarly, Schildkamp et al. (2024) found that teachers' attitudes and school data-use culture influence how assessment results are utilized. These

challenges demonstrate the need to strengthen data practices as a foundation for managerial efficiency. Across Africa, schools continue to experience challenges related to inadequate information systems, limited technological infrastructure, weak data-management skills, and inadequate support for evidence-based decision-making. Omoso and Nakitare (2026) identified leadership, organizational support, and data literacy as important factors influencing data-driven decision-making in Kenyan secondary schools. Likewise, Nishimwe and Thinguri (2026) found that data collection, analysis, visualization, and development of actionable insights are important components of data-driven school management in Rwanda. Alonzo et al. (2024) further demonstrate that ICT-based data systems can improve access to timely information and support

data-driven decision-making, although Decabooter et al. (2024) emphasize that human support and data coaching are also necessary for effective data use. In Uganda, the importance of educational data is reflected in efforts to strengthen the Education Management Information System (EMIS). Amuha and Masiero (2026) indicate that decentralizing EMIS can improve access to educational information for decision-makers, while Wambi (2025) found that student performance, teacher performance, and facilities data contribute to planning, staffing, and control in secondary schools. Similarly, Adisa (2026) explains that Education Management Information Systems support record keeping, data processing, storage, and retrieval, thereby providing information for school management. However, the effectiveness of these systems depends on the quality, completeness, accuracy, timeliness, and accessibility of the data collected.

Conceptually, data collection refers to the systematic gathering of information needed for planning, monitoring, evaluation, accountability, and decision-making. School data may be obtained through questionnaires, interviews, observations, assessments, attendance registers, financial records, administrative records, learner and teacher records, and ICT-based systems (Alonzo et al., 2024; Adisa, 2026). Data sources include learners, teachers, administrators, parents, examination records, financial records, infrastructure inventories, inspection reports, and education information systems. Wambi (2025) highlights the relevance of student, teacher, and facilities data, while Schildkamp et al. (2019) emphasize combining multiple data sources through collaborative data teams.

Furthermore, ethical considerations are essential because educational data may contain sensitive personal information. Ethical data collection requires privacy, confidentiality, informed consent, secure storage, restricted access, and responsible use. Guan et al. (2023) highlight privacy and security challenges in educational data use, while Muli (2024) emphasizes the legal and ethical importance of protecting learners' information. Stinar et al. (2024) similarly advocate privacy-preserving approaches when educational datasets are analyzed.

Finally, managerial efficiency refers to the ability of school administrators to achieve institutional

objectives through effective planning, resource utilization, coordination, supervision, monitoring, accountability, and timely decision-making. Schildkamp et al. (2019) and van den Boom-Muilenburg et al. (2023) demonstrate that leadership practices and supportive data-use cultures strengthen the use of information for school improvement. Therefore, this study examines how data collection influences managerial efficiency, focusing on data collection methods, sources, ethical practices, and the utilization of collected information for effective management.

Problem statement

Managerial efficiency in government-aided secondary schools remains a concern, particularly in strategic planning, resource management, and decisive decision-making. School administrators are expected to develop realistic plans, allocate limited resources effectively, and make timely decisions based on reliable information. However, weaknesses in the availability, accuracy, timeliness, and accessibility of school data may result in poorly informed plans, inefficient resource allocation, delayed responses to emerging challenges, and inconsistent managerial decisions. Lee et al. (2024) and Mausethagen et al. (2019) emphasize that effective leadership depends not only on the availability of data but also on how school leaders interpret and use it.

Existing studies indicate that systematic data collection can support planning, monitoring, evaluation, and decision-making. In Uganda, Wambi (2025) found that student-performance, teacher-performance, and facilities data contribute to planning, staffing, and control, while Amuha and Masiero (2026) highlight the importance of education management information systems in providing information for decision-making. Similarly, Alonzo et al. (2024) demonstrate the potential of ICT-based systems to strengthen data-driven decision-making, whereas Omoso and Nakitare (2026) identify leadership and data-literacy challenges affecting effective data use.

However, existing literature largely focuses on data use, EMIS, data-driven decision-making, or school performance, with limited attention to the specific effect of data collection on managerial efficiency.

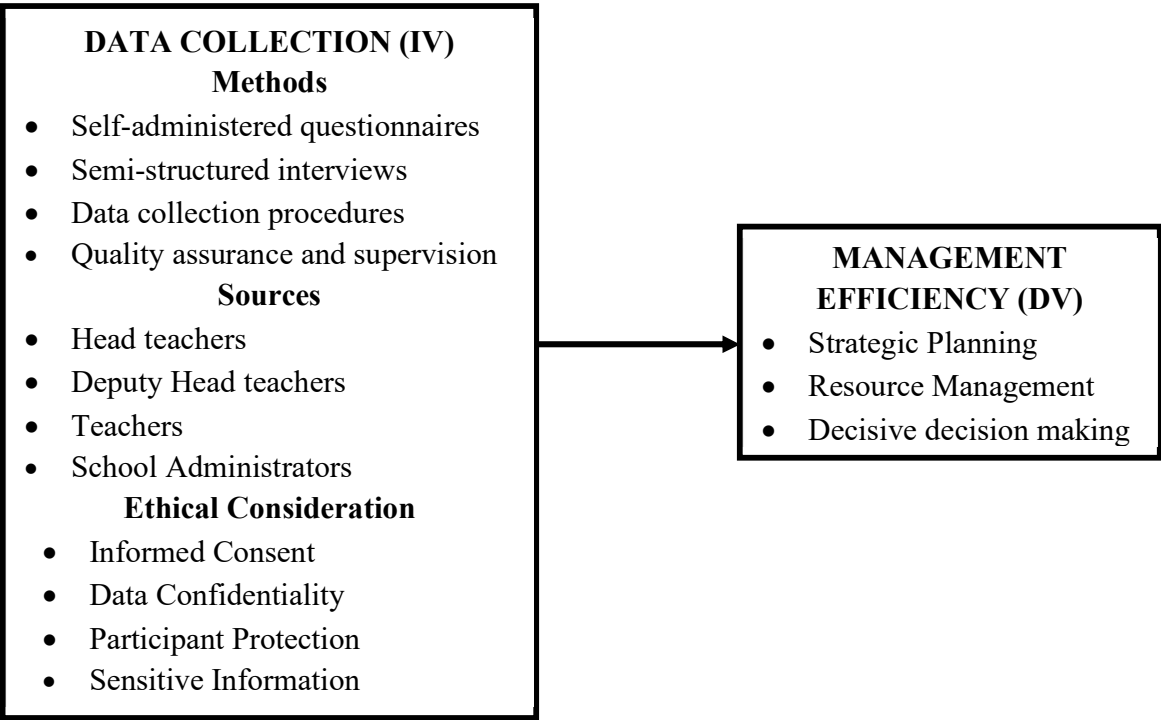
Documenting this relationship is therefore practically important for improving planning, resource allocation, and decision-making, while academically addressing a contextual and empirical gap. Consequently, this study examines the effect of data collection on managerial efficiency.

Purpose and Objectives

The purpose of this study was to examine the effect of data collection on managerial efficiency

Specific Objectives

- i. To examine the influence of data collection methods on managerial efficiency in schools.
- ii. To assess the influence of data collection sources on managerial efficiency in schools.
- iii. To determine the influence of ethical consideration on managerial efficiency in schools.



Source: Adopted from Biondi, L., & Russo, S. (2022).

The conceptual framework posits that data collection, operationalized through appropriate methods, credible information sources, systematic procedures, and quality-assurance mechanisms, influences managerial efficiency in government-aided secondary schools. Ethical safeguards, including informed consent, confidentiality, participant protection, and responsible handling of sensitive information, underpin the integrity of collected data. Consequently, high-quality data are expected to enhance managerial efficiency through evidence-informed strategic planning, optimal resource management, and decisive decision-making.

Literature review

Theoretical review

This study is anchored in the Data-Driven Decision-Making (DDDM; Mandinach et al., 2006) theory, which is the most applicable theoretical perspective for examining the effect of data collection on managerial efficiency in government-aided secondary schools in Mukono District. The theory argues that organizations improve performance when decisions are systematically informed by accurate, relevant, and timely data rather than intuition or assumptions. In schools, data from learners, teachers, assessments, attendance, finances, infrastructure, and administrative records can guide planning, resource

allocation, monitoring, and decision-making (Schildkamp et al., 2019; Lee et al., 2024).

DDDM is particularly relevant because effective data-driven management begins with appropriate data collection methods and sources. ICT-based systems, digital platforms, administrative records, assessments, interviews, and observations can generate information for managerial decisions (Alonzo et al., 2024; Hase & Kuhl, 2024). However, data collection alone does not guarantee efficiency. School leaders require data literacy, organizational support, collaboration, and leadership capacity to interpret and apply information effectively (Decabooter et al., 2024; van den Boom-Muilenburg et al., 2023). The theory is ideal for this study because it recognizes the importance of ethical data management, including privacy, confidentiality, secure storage, and responsible use.

Data Collection Methods and Managerial Efficiency

Data collection methods constitute an important foundation for managerial efficiency because the quality of managerial decisions depends largely on how information is gathered, verified, processed, and made available to decision-makers. In contemporary schools, data may be collected through questionnaires, interviews, observations, assessments, administrative records, attendance registers, digital learning platforms, and ICT-based information systems. Alonzo et al. (2024), in their review of literature published between 2013 and 2023, found that ICT-based data systems can support data-driven decision-making by improving teachers' access to and use of information. Similarly, Hase and Kuhl (2024) found that digital learning platforms provide teachers with data that can be used to inform instructional design, suggesting that digital methods can improve the availability of timely information for educational decision-making. These findings imply that appropriately designed collection methods can contribute to managerial efficiency by providing accurate and timely information for planning, monitoring, and intervention.

Beyond the availability of collection technologies, the effectiveness of data collection also depends on human support and organizational capacity. Decabooter et al. (2024), through a systematic review

of data coaching, established that human support is important for making data-based decision-making successful. This suggests that collecting data without developing the capacity of school leaders and teachers to understand and use it may have limited managerial value. In addition, Shamsuddin and Abd Razak (2024) emphasize the importance of systematic data practices in supporting educational decision-making, while van den Boom-Muilenburg et al. (2023) demonstrate that sustained data-use practices require leadership involvement, organizational routines, and professional learning communities. Thus, effective methods should not only generate information but also facilitate its interpretation and application.

However, the reviewed studies reveal a methodological and contextual gap. Much of the literature focuses on digital platforms, ICT systems, data teams, or instructional decision-making rather than directly examining how different data collection methods affect school managerial efficiency. Alonzo et al. (2024) focus mainly on teacher data-driven decision-making, while Hase and Kuhl (2024) concentrate on instructional design. Decabooter et al. (2024) primarily examine human support for data use rather than the direct contribution of collection methods to managerial outcomes. Therefore, this study sought to establish whether the methods through which schools collect data influence strategic planning, resource management, and decisive decision-making.

Data Collection Sources and Managerial Efficiency

The effectiveness of data collection is also influenced by the sources from which school information is obtained. School managers depend on information from learners, teachers, parents, examination records, attendance registers, financial records, infrastructure inventories, departmental reports, inspections, and digital education-management systems. Lee et al. (2024) demonstrate that school context influences how leaders use information in decision-making and how such practices relate to student achievement. Similarly, Alonzo et al. (2024) show that ICT-based systems can provide teachers and educational stakeholders with diverse information to support data-driven decisions. These studies suggest that

access to multiple and relevant sources can provide school managers with a broader evidence base for planning and management.

The value of multiple data sources is further demonstrated by Hase and Kuhl (2024), who found that teachers use information generated by digital learning platforms to inform instructional design. Likewise, Çevik and Doğan (2023) show that technological leadership and knowledge management influence data-driven decision-making among school principals. This indicates that data sources do not automatically produce managerial efficiency; rather, school leaders need the capacity to identify relevant information, integrate different sources, interpret it, and translate it into appropriate decisions. Shamsuddin and Abd Razak (2024) similarly emphasize the importance of information availability and appropriate data practices in supporting educational management.

Furthermore, the sustainability of data use depends on organizational arrangements that allow information from different sources to be discussed and interpreted collectively. Van den Boom-Muilenburg et al. (2023) found that sustainable data-use professional learning communities require leadership practices such as organizing meetings, active participation, and knowledge of data-use procedures. This implies that information from teachers, learners, assessment systems, and administrative records can become more useful when school leaders create structures for collective interpretation and application.

Nevertheless, a clear literature gap remains. Existing studies largely examine the availability and use of particular data sources rather than determining the extent to which the range, reliability, accessibility, and relevance of data sources affect overall managerial efficiency. Lee et al. (2024) focus on school context and leaders' data-informed decisions, while Hase and Kuhl (2024) concentrate on digital learning-platform data. Çevik and Doğan (2023) focus on technological leadership and knowledge management. Consequently, limited empirical attention has been given to how different sources of data jointly influence strategic planning, resource management, and decisive decision-making in government-aided secondary schools. This study therefore addresses this gap by examining whether

the sources from which schools obtain data contribute to managerial efficiency in Mukono District.

Ethical Considerations and Managerial Efficiency

Ethical considerations are increasingly important in educational data collection because schools handle information that may reveal learners' academic performance, attendance, behavior, socioeconomic circumstances, health-related information, and other personal characteristics. Ethical data management therefore involves privacy, confidentiality, informed consent, responsible access, secure storage, transparency, and appropriate use of information. Guan et al. (2023) explain that the increasing use of artificial intelligence and educational technologies has expanded the volume of educational data collected and created challenges concerning privacy, security, ownership, transparency, and responsible data use. Consequently, the effectiveness of data-driven management depends not only on collecting sufficient information but also on ensuring that the information is collected and used ethically.

Stinar et al. (2024) further demonstrate the tension between the usefulness of educational data and the protection of individual privacy. Their study developed an approach to k-anonymization that seeks to protect student identities while preserving the analytical value of educational datasets. They reported improved downstream machine-learning performance compared with baseline anonymization approaches, illustrating that privacy protection does not necessarily have to eliminate the usefulness of data. Similarly, Muli (2024), focusing on Kenyan secondary schools, reviewed the legal and ethical implications of data privacy in AI-supported educational settings and highlighted the need for effective privacy frameworks and responsible handling of learners' personal information.

Ethical data practices can consequently contribute to managerial efficiency by increasing trust among teachers, learners, parents, and administrators, thereby encouraging appropriate participation in data-collection processes. Conversely, weak privacy and confidentiality practices may discourage stakeholders from providing accurate information or may expose schools to legal, social, and reputational risks. Guan et al. (2023) therefore emphasize the need for appropriate governance mechanisms to address

emerging ethical dilemmas associated with educational data. Muli (2024) similarly argues for stronger legal and ethical safeguards in managing learners' information. These perspectives indicate that ethical considerations are not merely procedural requirements but may influence the reliability, accessibility, and usefulness of information for management.

However, the literature presents a significant conceptual and empirical gap. Stinar et al. (2024) concentrate primarily on technical anonymization, Guan et al. (2023) examine educational data ethics broadly in the intelligent-education environment, and Muli (2024) focuses on legal and ethical data-privacy issues among learners in Kenyan secondary schools. None of these studies directly establishes how ethical data-collection practices influence managerial efficiency, particularly in terms of strategic planning, resource management, and decisive decision-making. Therefore, this study sought to examine how privacy, confidentiality, responsible access, informed consent, secure storage, and ethical use of collected data influence managerial efficiency in government-aided secondary schools in Mukono District.

METHODS

Research Design: The study adopted a cross-sectional survey design using a quantitative approach. The design enabled the researcher to collect data from

respondents at a single point in time and establish the influence of data collection on managerial efficiency.

Population and Sample: The study population comprised 159 respondents, consisting of teachers and school administrators from these schools. The sample size of 113 respondents was determined using the Krejcie and Morgan (1970) sampling table, which provided an appropriate representative sample from the target population. However, 108 respondents fully complied and were selected from the identified schools to provide information relevant to data collection practices and managerial efficiency.

Data Collection Tools: Data were collected using a structured self-administered questionnaire developed around the study objectives. The questionnaire contained closed-ended items measured on a five-point Likert scale and covered data collection methods, data sources, ethical considerations, and managerial efficiency. The questionnaire was administered directly to the sampled teachers and school administrators. The second tool was an interview guide designed to collect information from the key informants. These were pretested using 5 experts.

Data Analysis: Inferential analysis was using linear regression analysis to examine the effect of the IV and its components on managerial efficiency. Statistical significance was assessed at the 5% level ($p < 0.05$).

FINDINGS

The inferential analysis highlights the extent to which data collection systems support managerial efficiency within government-aided secondary schools.

Table The effect of data collection on managerial efficiency

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1	(Constant)	1.157	.330	3.510	.001
	Data Collection	.581	.086	.550	.000

a. Dependent Variable: Managerial Efficiency; R² = 0.302; Adj-R² = 0.296

Source: Primary data

The regression results presented above demonstrate the extent to which data collection practices predict and influence managerial efficiency within the selected schools. The coefficient of determination implies that 30.2% of the changes in managerial efficiency is explained by data collection, whereas the remaining 69.8% is attributable to other factors.

Similarly, the adjusted R² value of 0.296 indicates that, after accounting for the sample size, the model still explains 29.6% of the variation in managerial efficiency, demonstrating that the model is relatively stable and reliable. Therefore, the findings imply that effective data collection is an important predictor of managerial efficiency, although other

managerial and organizational factors also contribute to improving school management. The regression coefficients provide information about the direction and magnitude of the relationship between data collection and managerial efficiency. To begin with, the constant (intercept) is 1.157 and is statistically significant ($t = 3.510$, $p = .001$), indicating that when data collection is held constant at zero, the predicted level of managerial efficiency would be 1.157. More importantly, the unstandardized regression coefficient for data collection ($B = 0.581$) is positive and statistically significant ($t = 6.774$, $p < .001$). Therefore, the findings demonstrate that strengthening data collection practices is likely to significantly enhance managerial efficiency. Ultimately, improving data collection will enable school managers to make more informed decisions, strengthen planning and monitoring processes, allocate resources more effectively, and improve overall institutional performance.

The quantitative findings on the influence of data collection practices on managerial efficiency were further supported by the views of a Head Teacher from a government-aided secondary school in Mukono District. The Head Teacher explained that effective data collection is central to planning, monitoring, decision-making, and improving the overall management of school activities. The respondent noted that schools that maintain accurate and timely data are better positioned to identify

challenges, allocate resources appropriately, and evaluate performance. The Head Teacher stated:

“strengthening data collection systems, training staff on proper record keeping, and encouraging timely reporting are important for improving managerial efficiency in schools.” (Head Teacher)

The Head Teacher’s views reinforce the regression findings, which showed that data collection significantly predicts managerial efficiency ($R = 0.550$, $R^2 = 0.302$, $p < .001$). The interview evidence demonstrates the practical mechanisms through which data collection improves management effectiveness, including supporting evidence-based planning, monitoring school performance, identifying emerging challenges, and guiding resource allocation. Furthermore, the Head Teacher’s emphasis on data accuracy, completeness, and timeliness reflects the importance of quality data collection practices in ensuring reliable managerial decisions. Therefore, the findings suggest that strengthening data collection systems in government-aided secondary schools can enhance managerial efficiency by enabling administrators to make informed decisions, improve accountability, and respond effectively to institutional needs

Table: The effect of data collection practices on managerial efficiency

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.688	.279		2.466	.015
Methods	.212	.053	.290	4.017	.000
Sources	.185	.065	.207	2.855	.005
Ethics	.378	.056	.485	6.765	.000

a. Dependent Variable: Managerial Efficiency

The regression results revealed that data collection methods, data sources, and ethical considerations all had positive and statistically significant effects on managerial efficiency in government-aided secondary schools. The standardized coefficient ($\beta = 0.485$) shows that ethical considerations were the

strongest predictor of managerial efficiency in the model, followed by data collection methods ($\beta = 0.290$) and data sources ($\beta = 0.207$).

The constant ($B = 0.688$, $p = 0.015$) indicated that, when data collection methods, data sources, and ethical considerations were held at zero, the predicted level of managerial efficiency was 0.688.

Overall, since the significance values for data collection methods ($p < 0.05$), data sources ($p = 0.005$), and ethical considerations ($p < 0.001$) were all below the 0.05 significance threshold, the null hypotheses that these factors had no significant effects on managerial efficiency were rejected. The findings therefore demonstrated that improvements in data collection methods, the quality and diversity of data sources, and adherence to ethical data-collection practices were associated with improved managerial efficiency, with ethical considerations making the greatest contribution.

Discussion

The findings established that data collection had a significant positive effect on managerial efficiency, suggesting that systematic, accurate, and timely information gathering strengthened school administrators' capacity to plan, monitor, allocate resources, and make evidence-based decisions. This finding is consistent with Hase and Kuhl (2024), who emphasized the importance of effective data practices in supporting informed decision-making and organizational improvement. Similarly, Shamsuddin and Abd Razak (2024) highlighted the contribution of structured data practices to evidence-based management.

The positive influence of data collection methods further concurs with Alonzo et al. (2024), who demonstrated that ICT-supported data systems enhance access to timely information and facilitate data-driven decision-making. Decabooter et al. (2024) similarly emphasized that effective data use requires appropriate systems alongside human support and capacity development. Hase and Kuhl (2024) reinforce the importance of developing competencies that enable users to translate collected information into meaningful managerial actions.

The finding that data sources significantly influenced managerial efficiency is also supported by Çevik and Doğan (2023) and van den Boom-Muilenburg et al. (2023), who emphasized the importance of diverse and reliable information in strengthening school leadership and decision-making. Furthermore, the strong effect of ethical considerations aligns with Guan et al. (2023), Stinar et al. (2024), and Muli (2024), who stressed privacy, confidentiality, security, and responsible handling

of educational data. Overall, the findings demonstrate that managerial efficiency depends not merely on collecting data but on using appropriate methods, credible sources, and ethical practices to transform information into effective managerial action.

Conclusion

The findings demonstrated that data collection practices explained 30.2% of the variation in managerial efficiency, indicating that effective collection of reliable, timely, and relevant information contributed substantially to how school administrators planned, monitored, coordinated, and made decisions. The significant regression model ($F(1,106) = 45.893$, $p < .001$) further confirmed that data collection was an important predictor of managerial efficiency.

At the specific-dimension level, data collection methods, data sources, and ethical considerations all exerted positive and statistically significant effects on managerial efficiency. Ethical considerations emerged as the strongest predictor, followed by data collection methods and data sources. This suggests that managerial efficiency depended not only on the availability of data but also on the appropriateness of collection procedures, diversity and reliability of information sources, and adherence to ethical standards governing data handling. The qualitative evidence reinforced these findings by showing that accurate and timely data supported evidence-based planning, resource allocation, monitoring, accountability, and timely intervention. Therefore, strengthening school data collection systems, staff capacity in record keeping, data quality assurance, and ethical data management would enhance managerial efficiency and enable government-aided secondary schools to make more informed and responsive management decisions.

Recommendations

Schools should strengthen data collection systems, diversify and verify data sources, and enforce ethical data management through staff training, secure information handling, and regular data quality assurance.

REFERENCES

- Adisa, O. (2026). Educational management information system: Its relevance to record keeping and processing in secondary schools. *Universal Education Journal of Teaching and Learning*, 3(2), 162–170.
- Ahairwe, F., & Atukunda, L. (2025). Leveraging big data for effective educational management. *IDOSR Journal of Arts and Management*, 10(1), 1–5.
- Alonzo, D., Quimno, V., Townend, G., & Zin Oo, C. (2024). Using information and communication technology (ICT)-based data systems to support teacher data-driven decision-making: Insights from the literature (2013–2023). *Educational Assessment, Evaluation and Accountability*, 36, 433–451. <https://doi.org/10.1007/s11092-024-09443-8>
- Amuha, M. G., & Masiero, S. (2026). The interplay of institutional logics in the decentralization of an education management information system: A case of Uganda. *The Electronic Journal of Information Systems in Developing Countries*, 92(3), e70066.
- Çevik, M. S., & Doğan, E. (2023). The mediating and moderating effects of knowledge management in the relationship between technological leadership behaviors of school principals and data-driven decision-making. *Educational Policy Analysis and Strategic Research*, 18(1), 50–76. <https://doi.org/10.29329/epasr.2023.525.3>
- Decabooter, I., Warmoes, A., Consuegra, E., Van Gasse, R., & Struyven, K. (2024). The data coach chronicles: A systematic review of human support for making data-based decision-making a success. *Teaching and Teacher Education*, 146, 104641. <https://doi.org/10.1016/j.tate.2024.104641>
- Guan, X., Feng, X., & Islam, A. Y. M. A. (2023). The dilemma and countermeasures of educational data ethics in the age of intelligence. *Humanities and Social Sciences Communications*, 10, Article 138. <https://doi.org/10.1057/s41599-023-01633-x>
- Hase, A., & Kuhl, P. (2024). Teachers' use of data from digital learning platforms for instructional design: A systematic review. *Educational Technology Research and Development*, 72, 1925–1945. <https://doi.org/10.1007/s11423-024-10356-y>
- Lasater, K., Albiladi, W. S., & Bengtson, E. (2021). Developing positive data cultures in high-stakes environments: The role of school leaders. *Journal of Cases in Educational Leadership*, 24(3), 49–62.
- Lee, C., Camburn, E. M., & Sebastian, J. (2024). School context, school leaders' data-informed decision making, and student achievement: Evidence from Florida. *School Effectiveness and School Improvement*, 1–26. <https://doi.org/10.1080/09243453.2024.2436889>
- Mandinach, E. B., Honey, M., & Light, D. (2006). A theoretical framework for data-driven decision making, pp 39–52.
- Mausethagen, S., Prøitz, T. S., & Skedsmo, G. (2019). School leadership in data use practices: Collegial and consensus-oriented. *Educational Research*, 61(1), 70–86.
- Muli, M. (2024). Legal and ethical implications of data privacy in artificial intelligence: A review of data privacy among learners in Kenyan secondary schools. *Journal of the Kenya National Commission for UNESCO*, 5(1). <https://doi.org/10.62049/jkncu.v5i1.170>
- Muli, M. (2024). Legal and Ethical Implications of Data Privacy in Artificial Intelligence: A Review of Data Privacy among Learners in Kenyan Secondary Schools. *Journal of the Kenya National Commission for UNESCO*, 5(1). <https://doi.org/10.62049/jkncu.v5i1.170>
- Nishimwe, C., & Thinguri, R. (2026). Influence of school management data-driven practices on school performance in public primary schools in Gatsibo District, Rwanda. *International Journal of Management and Development Studies*, 15(6), 155–161.
- Omoso, E., & Nakitare, J. (2026). Data-driven decision making in Kenyan secondary schools: Enablers and barriers. *Journal of School Leadership*, 36(4), 505–526.
- Pangrazio, L., & Bunn, A. (2024). Assessing the privacy of digital products in Australian schools: Protecting the digital rights of children and young people. *Computers and Education Open*, 6, Article 100187. <https://doi.org/10.1016/j.caeo.2024.100187>
- Rojas-Bravo, J., Fromm, G., & Carrasco-Ogaz, D. (2024). School conditions and principal practices promoting instructional data use in high-stakes accountability systems. *Studies in Educational Evaluation*, 83, Article 101399. <https://doi.org/10.1016/j.stueduc.2024.101399>

Schildkamp, K., et al. (2023). Sustaining data use professional learning communities in schools: The role of leadership practices. *Studies in Educational Evaluation*, 78, 101273.

Schildkamp, K., Poortman, C. L., Ebbeler, J., & Pieters, J. M. (2019). How school leaders can build effective data teams: Five building blocks for a new wave of data-informed decision making. *Journal of Educational Change*, 20, 283–325.

Schildkamp, K., Poortman, C., Luyten, H., & Ebbeler, J. (2024). The relationship between teachers' and principals' use of results from nationwide achievement tests: The mediating role of teacher attitudes and data use culture. *Studies in Educational Evaluation*, 80, 101317.

Stinar, F., Xiong, Z., & Bosch, N. (2024). An approach to improve k-anonymization practices in educational data mining. *Journal of Educational Data Mining*, 16(1), 61–83.

van den Boom-Muilenburg, S. N., Poortman, C. L., Schildkamp, K., de Vries, S., & van Veen, K. (2023). Sustaining data use professional learning communities in schools: The role of leadership practices. *Studies in Educational Evaluation*, 78, Article 101273.

<https://doi.org/10.1016/j.stueduc.2023.101273>

Wambi, P. (2025). *Data types and management of secondary schools in Mbale District, Uganda* [Master's dissertation, Uganda Christian University]. Uganda Christian University Institutional Repository.