Data Management Practices and Decision Making in Public Primary Schools in Nwoya District

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Declaration

I, Phillip Oryema, do declare that this dissertation, titled "Data Management Practices and Decision Making in Public Primary Schools in Nwoya District," is my original work and has never been submitted for an academic award to any university or institution.

Signature.....…… Date……24th/6/2026……

Approval

This research Report “Data Management Practices and Decision Making in Public Primary Schools in Nwoya District” has been developed with my guidance and has been submitted to the Directorate of Research and Graduate Training, Gulu University, with my approval.

Signature…… Date…24/06/2026……

Dr. Jerry Bagaya

(Supervisor)

Dedication

This research dissertation is dedicated to my Father, Mzee Okeny Lugard, to my mother Mego Akwero Santa and to my brother, Mr. Nyero Geoffrey whose resolute love and support have been the driving force behind my academic pursuits. Your encouragement and belief in me have been constant source of motivation and I am forever grateful for your trust.

I also dedicate this research dissertation to my Wife, Mrs. Aber Prishillar Peace and my children whose steadfast love and support have been the motivating force behind my academic pursuits. Her encouragement and belief in me have been constant source of inspiration and I am forever grateful for her confidence.

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I also dedicate this research dissertation to my friend Mr. Okeny Geoffrey Goddie with whom we shared experiences and guidance to each other, My brother, the experience sharing have been tangential to me in shaping my research knowledge. His friendship has been a precious asset to me.

Finally, I would like to dedicate this research to all those who have been affected by the subject matter of this study. It is my hope that this work will contribute to the advancement of knowledge and understanding in the field and ultimately lead to positive change and progress.

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Abstract

Data plays a very important role in a school as it informs decision-making based on information generated by it. Given its central role, effective data management practices are necessary to uphold data integrity and provide opportunities for effective problem-solving at school level. The study assessed the relationship between data management practices and decision-making in public primary schools in Nwoya District, Northern Uganda. Data were collected from 301 participants across 44 government-aided primary schools in Nwoya District using a combination of purposive and simple random sampling techniques. The study employed a cross-sectional design, with data analysed using descriptive statistics, including frequency distributions and measures of central tendency (mode and median) at the univariate level. Furthermore, Pearson correlation and multiple regression analyses were applied to examine the relationships between the various components of data management practices and decision-making in the schools. Findings from the study showed that data collection was most practised, while data processing, data interpretation, and data security were not well practised in public primary schools in Nwoya District. A significant difference in decision-making levels was noted among teachers, administrators, and school management. Finally, the study showed that there is a positive correlation between the components of data management practices and decision-making in public primary schools in Nwoya district. It is recommended that stakeholders concerned with promoting quality education should invest in data infrastructures and training stakeholders on data management practices so as to improve the quality of decisions made in schools.

Chapter One

Introduction

Data plays a pivotal role in schools as it informs decision-making processes based on evidence-based information generated by it. Given its significance, effective data management practices are necessary to uphold data integrity, enable effective problem-solving, and provide an avenue to compete favourably. Reliable data and effective data management practices are vital in avoiding inconsistent decision-making and in facilitating effective planning for financial resources, physical infrastructure, student programmes, and human resource management within the school system (Owan & Bassey, 2019; Tripathi, Shukla & Sonker, 2017). The quotes below underscore the critical importance of data in administrative processes.

"In the absence of data, decisions are merely based on personal opinion; therefore, a balance between the utilisation of data and professional experience is necessary. Just as a patient would expect a doctor to rely on evidence about their condition in order to make informed decisions rather than depending solely on intuition (Vanlommel et al.*, 2017), so too can data be employed to support sound judgments, optimise the use of resources, and advance development goals" (Ministry of ICT & National Guidance, 2024).*

There is critical need to improve educational and sports outcomes in public primary schools through effective data management practices, acting as the backbone of school management and administration, influencing resource allocation, student performance monitoring, and institutional accountability. Use of effective data management practices directly influences student learning by enabling educators to move from intuition to actionable insights. Proper data management practices allow school leaders to use data to identify at-risk students, attendance issues, and performance gaps, facilitating timely, targeted interventions and budget are directed toward areas with the

highest impact, thereby reducing waste

This study assessed the relationship between data management practices and decision-making within public primary schools in Nwoya District in Northern Uganda. The chapter outlines the study's background, problem statement, research objectives and questions, scope, significance, and the conceptual framework.

1.0 The Background of the Study

This chapter covered Historical background, Theoretical background, conceptual background and contextual background of the study.

1.1 Historical Background

In contemporary organisations, such as schools, there is a constant influx of data being generated, stored, and analysed, aiming to enhance decision-making (Tyrteou, 2016). The emphasis on data-driven decision-making in education started becoming prominent in 2001; the United States of America introduced the No Child Left Behind (NCLB) policy, which prioritised accountability (Kazu & Kuvvetli, 2023). However, in many low and middle-income countries, including their primary education sectors, challenges persist regarding data management and its utilisation for decision-making (McBurnie, 2021). Despite these challenges, there's a noticeable shift towards making decisions in schools based on evidence and information gathered from data due to its significant benefits in enhancing school performance and service delivery (Duz, 2023). The global trend towards datafication and associated practices is increasingly becoming crucial, with significant implications for schools worldwide, particularly in the area of decision-making process (Creswell & Creswel, 2017). Therefore, it is apparently clear that data is central to the delivery of public services, including education, and to maximise its use throughout its lifecycle, we need an appropriate strategy to manage it (Kelly et al., 2023).

Uganda's primary education sector has witnessed significant investment for improved decision-making (USAID, 2017). However, stakeholders continue to question the quality of decision-making due to the observed poor service delivery within the primary education sector (Fujimoto, Ogawa, Komukai & Nakayama, 2020).

Several studies have highlighted gaps in decision-making within Uganda's primary education sector. Kabeireho (2023) identified deficiencies in decision-making quality and levels, leading to low academic performance, inadequate service delivery, and staffing issues. Fujimoto et al. (2020) also noted that limited decision-making quality contributes to insufficient facilities in both urban and rural-based primary learning institutions. The Ministry of Education and Sports identified inadequate data flow as a key factor affecting decision-making processes and, subsequently, service delivery (Ministry of Education and Sports, 2016). This highlights the crucial role of data management practices in driving effective decision-making within primary school programs (Masha et al., 2017). However, in Uganda, research has not yet widely examined the link between data management practices and decision-making processes (Ministry of Education and Sports, 2017).

Data is universally recognised as a strategic asset across organizations due to its multifaceted functions. It informs adaptation to change, enhances organizational design and management, improves operations, services, and products, and drives strategic decision-making (Nyman et al., 2024). Given its pivotal role in organizational success, proper data management practices, including collection, storage, retrieval, analysis, and sharing, should be enforced to ensure data centrality in decision-making processes (Nyman et al., 2024).

1.2 Theoretical Background

This study was steered by the Statistical Decision Theory (SDT) advanced by Leonard Savage in 1951. The Statistical Decision Theory assumes that decision making is premised on the presence of statistical knowledge by shedding light on uncertainties involved in the problem (Berger, 2013). This provides a basis for the selection of an action using a statistical decision rule (Berger, 2013). This research assumes that when primary schools' stakeholders adopt effective data management practices, it leads to quality decision-making. The Statistical Decision Theory derives its strength by throwing light on uncertainties regarding available actions and the set of admissible states of nature.

Additionally, the study may be guided by the Normative and Optimal Decision Theory advanced by Herbert A. Simon (Kalantari, 2010). According to the normative perspective, decision-makers are assumed to be fully rational, always seeking the outcome with the highest expected value. Such an actor is presumed capable of achieving the maximum possible value with complete accuracy. On the other hand, an optimal decision refers to one that yields an outcome that is at least as favourable, whether known or expected, as all other available alternatives. Nonetheless, both the Normative and Optimal Decision Theories have notable limitations, including the time required to apply them, the tendency to compromise decisions, and their inherent subjectivity. The study was also adapted from Decision Theory (DT), initially developed by Oskar Morgenstern (1902–1976) and John Von Neumann (1903–1976) (Vercelli, 2012), which examines how choices are made from among various alternatives. However, DT primarily addresses the process of making decisions and provides limited insight into the actual quality of the decisions reached by decision-makers.

1.3 Conceptual Background

Data plays a pivotal role in informed decision-making for effective organizational performance. Robust data management practices typically follow systematic patterns within the data lifecycle, encompassing processes such as data collection, data processing, data interpretation, and data security. In organizations like schools, management must plan the creation of data, determine its type and purpose, and address legal issues involved in collecting it. Schools need to collect the data, know its sources, validate it, and decide whether to collect it manually or digitally (Government of Ireland, 2023). Additionally, organizations need to store the data properly, ensure easy integration and access, and determine who should access it and how to protect it. They must consider data processing, including analysis, public access, and visualization methods. At the end of the data lifecycle, organizations should decide whether to archive or destroy the data (Government of Ireland, 2023). In school settings, proper data lifecycle practices can enhance the quality of decision-making (Munier, Hontoria & Jiménez-Sáez, 2019).

Decision-making is understood as the act of choosing future courses of action based on reliable evidence or factual information (Owan & Bassey, 2019). This study examines how data management practices such as data collection, processing, interpretation, and security shape decision-making in public primary schools. In this study, decision-making is taken to mean determining future actions guided by relevant facts, and it is analysed at the strategic, tactical, and operational levels.

In the context of this study, data management practices denote the systematic strategies and procedures employed to manage data with the aim of producing information that facilitates informed decision-making. The study assessed these practices through key aspects including data collection, interpretation, processing, and security. Data collection, in this case, involves obtaining both primary and secondary

information using methods such as surveys, interviews, and review of documents. Data processing involves the organisation and transformation of collected data into a format that is suitable for analysis and utilisation (Alex & Nayahi, 2020). Data interpretation is the process of examining data to identify patterns, trends, and relationships, ultimately leading to meaningful conclusions and informed decisions. Data security practices involve protecting information throughout its entire life cycle to prevent unethical practices and unauthorised access. This study focused on exploring how data collection, processing, interpretation, and security practices influence decision-making in public primary schools in Uganda.

1.4 Contextual Background

In Uganda, the Uganda Bureau of Statistics (UBOS), working together with the Ministry of Education and Sports (MoES), designed a five-year strategic plan to improve the quality and use of statistical data within schools (Ministry of Education and Sports, 2016). Consequently, the MoES introduced the Education Management Information System (EMIS) to support school data management and decision-making (Ministry of Education and Sports, 2019). This was necessary because many schools appear to have overlooked the importance of data for school management, and Nwoya district schools are no exception. Decision-making based on data (processing, analysis, and interpretation) in primary schools has been identified as one of the factors hindering good performance in Nwoya district (NDLG School Inspection Report 2022).

Furthermore, research has shown that many educators exhibit apprehension towards the use of data and maintain weak record-keeping practices within educational institutions (Ndiku, Oyoo, & Owano, 2014). Such tendencies can significantly hinder the capacity of school management to effectively plan and administer school operations.

Furthermore, data management practices need to be done continuously to boost the quality of decision-making in schools (Munier, Hontoria & Jiménez-Sáez, 2019). The challenge of data management practice in Uganda is partly attributed to the inability of the Education Management Information Systems (EMIS) which moves data from schools and concentrate them to national and global levels, making it difficult for the schools in rural areas to use such data to solve their problems (Abesigamukama Amuha & Nyanzi, 2023). Thus, schools miss out on important reports that concern them. It is therefore important to concentrate data collection and use at the primary schools to improve school management and functions. Whereas, Uganda is successful in improving access to education under the Universal Primary Education (UPE) program, the quality remains low. This is attributed to old teaching methods, poor teaching resources, high teacher and pupil absenteeism, dropout, low progression rates, and low literacy and numeracy levels among others (Van Geel et al., 2016). This study assessed the relationship between data management practices and decision-making in primary schools in Nwoya District in Northern Uganda.

1.5 Statement of the Problem

In Public Primary Schools, effective data management practices are very important for generating information that support decision making process at all levels, however, data management practices are often compromised. Schools collect vast amounts of data from critical data points for compliance and reporting, these data are frequently underutilized for strategic decision-making, leading to administrative inefficiencies and reactive rather than proactive planning. Decision-making in Public Primary Schools remains largely intuitive due to failure to use effective data management practices necessary for generating meaningful information. Consequently, most public schools fail to address systemic issues like declining academic standards. Government of Uganda, in

collaboration with various development partners, has invested significantly in enhancing decision-making to advance the excellence of primary schooling in the country (Michelsen & Wells, 2017). Despite this investment, stakeholders continuously question the quality of data management practices and decision-making, as these investments are not reflected in the service delivery within the primary education sector (Ogawa et al., 2023), leading to ineffective decisions regarding school performance, service delivery and staffing problems.

Kabeireho (2023), in a study on organisational decentralisation and educational service delivery in Uganda, identified persistent shortcomings in the quality and scope of decision-making within primary schools. Similarly, Ogawa et al. (2019), in their study on the impact of the School Facilities Grant on access and learning outcomes in Uganda's primary education sector, also observed limited decision-making within schools. Challenges such as insufficient classrooms, teacher housing, and poor sanitation facilities were noted. Poor decision-making has severe consequences for the operation of school programs, and if these challenges persist, primary schools will continue to provide inadequate services, leading to dissatisfaction among parents and poor performance among teachers and pupils (Ogawa et al., 2019).

Several interventions have been recommended to address the issues facing primary schools in Uganda, including increasing funding, staff motivation, effective supervision, improving structures and infrastructure, and enhancing competencies (Ogawa et al., 2019; Kabeireho, 2023; Ministry of Education and Sports, 2016). Despite these recommendations, the need for adequate data to drive decision-making remains critical (Masha, 2014; Kabeireho, 2023). Sufficient data is crucial as it enhances the excellence of decision-making and, in turn, improves the standard of service delivery (Ministry of Education and Sports, 2016). Consequently, this study studied the effect of

data management practices on decision-making in public primary schools within Nwoya District.

1.6 Purpose of the Study

To determine how data management practices influence decision making in public primary schools in Nwoya district.

1.7 Objectives of the Study

1. To determine the data management practices in public primary schools in Nwoya District.
2. To determine the levels of decision-making in public primary schools in Nwoya District.
3. To establish the relationship between data management practices and decision-making in public primary schools in Nwoya District.

1.8 Research Hypothesis

1. There is no significant difference in data management practices in public primary schools in Nwoya District.
2. There is no significant difference in the level of decision-making in public primary schools in Nwoya District.
3. There is no significant relationship between data management practices and decision-making in public primary schools in Nwoya District.

1.9 Scope of the Study

In terms of the geographical scope, this study was conducted in 44 public primary schools in Nwoya District because public primary schools have manageable systems that are comparatively similar, unlike those for private and community primary schools. The respondents comprised of Chairperson SMCs, Head teachers, Deputy Head teachers and teachers. The content scope of this research was data management practices, decision-making and the relationship between data management practices and decision-making.

With regards to the time scope, data was collected within the period of 10 years (2014-2024) due to the limited literature.

1.10 Significance of the Study

This study examined the association between data collection practices, data processing practices, data interpretation practices, data security practices and levels of decision making in public primary schools in Nwoya District in Northern Uganda.

It was envisioned that findings of this study may help policy-makers, school management committees, school administrators and classroom teachers to enhance their decision-making quality by implementing appropriate strategies to improve the quality and effectiveness of their decisions. This may lead to more efficient resource allocation, improved educational programming and implementation of educational programmes for better outcomes.

Furthermore, this study may contribute to the understanding of how public primary schools use data to manage school and learning activities. It makes school managers and teachers understand how data management practices facilitate or hinder a school's learning and adaptation during their operations. In addition, the study would contribute to knowledge and literature in the field of education management and data-driven decision-making in schools.

1.11 Conceptual Framework

A conceptual framework presented in Figure 1 shows the relationship between data management practices (independent variables) and decision making (dependent variable). It presupposes that the decision-making in public primary schools is dependent on four dimensions of data management practices: data collection practices, data processing practices, data interpretation practices, and data security practices. Therefore,

improving data management practices in each of the four areas given favourable government policies, school culture, and available resources would likely increase the possibilities of successful decision-making in public primary schools, at strategic, tactical and operational levels.

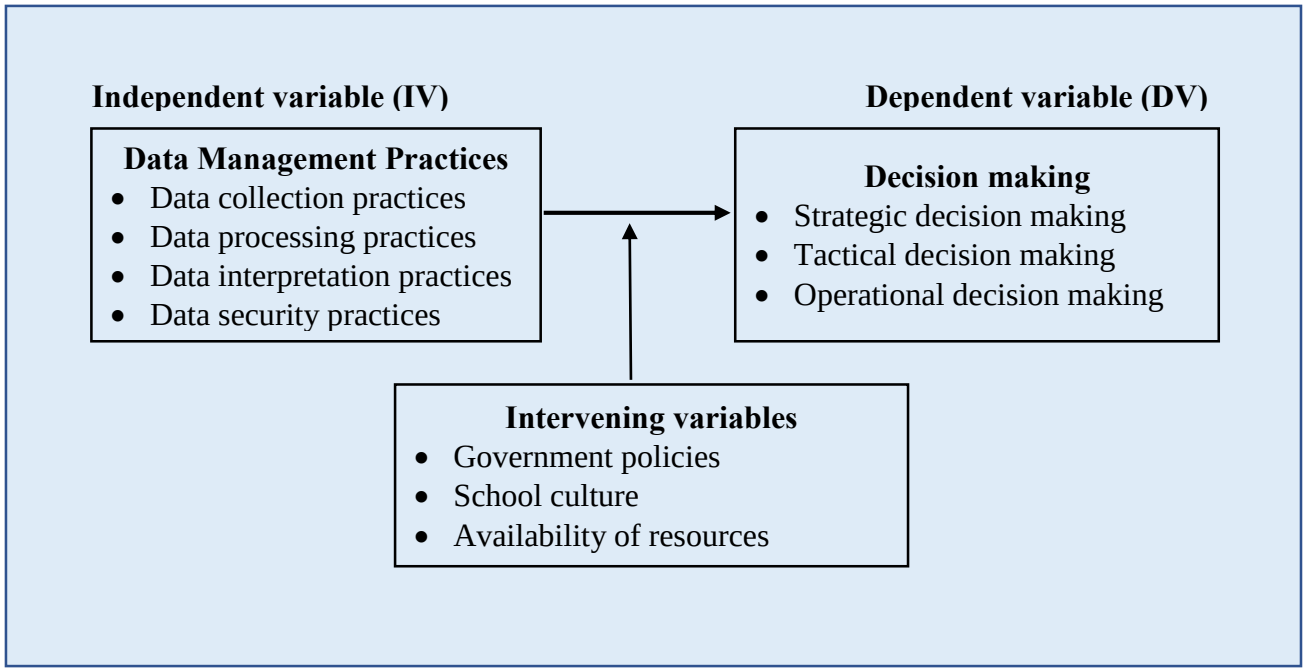


Figure 1 A conceptual framework on the relationship between data management practices and decision making in Nwoya public primary schools.

Chapter Two

Literature Review

This chapter reviews related literature in the areas of data management practices, decision making and the relationship between data management practices and decision making presented under themes related to the study objectives.

2.1 Data Management Practices

Shen (2015) undertook a study on data assessment and the institutional landscape at Virginia Tech, aimed at examining data sharing and reuse practices by mapping the extent of user engagement in data openness, methodological transparency, workflow accessibility, and the reuse of existing data. The findings revealed a notable disparity between the limited level of data sharing and the highly supposed value of data reuse or repurposing, suggesting that much of the probable worth of data is lost immediately after the original research is completed. Shen (2015) further observed that fragmented and localised approaches to data management and documentation create significant challenges for the reuse of existing data. Nevertheless, the study relied on focus group discussions, a method that presents certain limitations, such as restricting participants from freely expressing their views, difficulty in obtaining candid opinions on sensitive issues, and the risk of biased responses. This research used a questionnaire to gather data as it allows openness, permits objectivity, and avoids biases.

A study by Ubaidullah, et al. (2017) in Malaysia found that numerous government agencies, including schools and district education offices, still rely on manual methods of data management, which are both unreliable and insecure. Of particular concern was the absence of data backup systems in many schools, a gap that could have severe consequences if critical information were lost or damaged due to

unforeseen events. Additionally, in cases where data was duplicated, most copies existed only in printed form. The study employed a qualitative design, using semi-structured interviews with eight school principals and one District Education Officer. However, the qualitative approach presents a higher risk of bias and subjectivity in the findings. This research will use a quantitative approach to reduce biases and ensure objectivity.

According to England's (2021) study, data management practices include documentation, planning, formatting, storing, archiving, protecting and sharing. However, England (2021) only considered a small area; that is, data management practices within the library and not the whole school. For this study, data management practices were looked at from all aspects detailed under data collection, storage, analysis and security in all departments and units to arrive at a more comprehensive outcome on data management practices in primary institutions in Nwoya District.

A study examining data sharing practices and attitudes among geophysicists found that, while data sharing and reuse were generally beneficial, participants expressed concerns regarding the practical aspects of sharing their data, including risks of potential misuse and the need for proper citation and acknowledgement (Tenopir, Christian, Allard & Borycz, 2018). The study, however, employed an online survey, which has inherent limitations such as the risk of biased data and low response rates (only 74%) if the distribution channels are not well selected. In contrast, this research used questionnaires administered directly to respondents by the researcher or a research assistant, ensuring proper delivery and enhancing the response rate.

Farah, et al. (2017) conducted a survey of teachers on educational data management practices, focusing on tracking and storage, and found that multiple methods exist for monitoring and storing student activity data. However, the study had a

limited scope, addressing only data collection and data storage. In contrast, this research explored additional data management practices to provide a more comprehensive understanding and draw general conclusions about data management in schools.

In a study conducted by Schumacher and VandeCreek (2015) on intellectual capital at risk, examining data management practices and data loss, revealed that most respondents possessed limited knowledge of established principles in the field of data curation, which guide the proper administration of digital materials. Instead, they relied on personal storage devices and cloud accounts to manage and store work-related data (Schumacher & VandeCreek, 2015). Furthermore, the majority of respondents reported having lost at least one important work-related digital item during the course of their professional careers. However, the research used descriptive statistics, which only allows summations about the people being measured and cannot be used for generalising to other people.

In a study investigating the data management practices that scholars should adopt to maintain the quality of their data, several key practices were identified. These included data generation, data storage, data backup, data retrieval, data citation, data publication, data reuse, and data disposal through shredding (Bassey, Owan & Eze 2019). The research was on only one aspect within the school, which is data management in research. However, this research analysed overall data management practices in primary schools in Nwoya District.

2.2 Decision-Making

Gamede and Uleanya (2021) explored the impact of stakeholders' participation in rural education in South Africa using review method by reviewing relevant literatures. The finding of the study showed that the reasons for poor academic performances of

learners in rural areas of South Africa could be attributed to various factors, however, the role and active participation of rural education stakeholders in salvaging the situation is inevitable. The study therefore recommends that schools should absorb the participative management system where all rural education stakeholders are made to participate in decision-making, and other needful areas. However, the study reviewed relevant literatures on the impact of stakeholders' participation in rural education in South Africa and reviewing literature only may carry gaps of the previous studies. In this study, primary data was collected from the target population allowing for a thorough assessment of decision-making levels in government primary schools within Nwoya District.

A study by Ahmed, Malik, and Ahmed (2019), which explored current academic decision-making practices and the differences in such practices between high schools in Punjab and Khyber Pakhtunkhwa, Pakistan, found that similar academic decision-making approaches were applied for planning objectives, setting targets, conducting internal and external assessments, developing students' skills, assessing interests and aptitudes, and monitoring student activities, among other functions. However, the study focused solely on academic decisions. In contrast, schools involve multiple facets of decision-making, including disciplinary and co-curricular matters, and engage a range of stakeholders such as School Management Committees (SMCs), headmasters and their deputies, and teachers. These groups form the target population for the study, allowing for a thorough assessment of decision-making levels in government primary schools within Nwoya District.

Amalia, et al. (2020) found that in Bandung, Indonesia, a principal's decision-making could be observed through three leadership roles: the regulative role, which involves enforcing staffing and educational rules; the democratic role, which pertains to

policies addressing the school's interests independently without involving other institutions; and the persuasive role, which focuses on making decisions with a humane approach. The study employed a qualitative research design, which has limitations, including challenges in verification and limited statistical representativeness. In contrast, this research will adopt a quantitative approach, as it allows for verifiable results and statistical representation both descriptively and inferentially.

In a study looking at how strategic decisions affected secondary school performance in Nakuru Sub County, Kariuki (2015) discovered that schools used the decision-making process to a moderate to very noteworthy degree. This involved assessing plans before they were put into action, investigating and incorporating ideas, making sure that strategic decisions were committed to and supported, choosing the best options, establishing a supportive environment, having the Board of Management thoroughly review options, and informing all parties involved of decisions practices that were extensively used in the secondary schools under study. The gap in the work of Kariuki (2015) is the use of descriptive statistics only, but not both descriptive and inferential statistics for a generalization, making the results practically not feasible for other populations.

A study on the implementation of tactical decisions in Kenyan public universities, focusing on Egerton University and Jomo Kenyatta University of Agriculture and Technology (JKUAT), found out that the internal management environment had a very strong link with the successful execution of tactical decisions (Ogaja & Wanyoike, 2015). However, Ogaja and Wanyoike (2015) used only two Universities, which is a very small sample size for Universities; this research used a wider scope for a more representative sample.

Eriş, Kayhan, Baştaş and Gamar (2017) conducted a study to determine teacher and administrative staff views on teachers' participation in school related decision-making process in primary schools in Northern Cyprus. In the study, quantitative data were collected and the design of the study was determined as "general screening model." All of the administrators, serving in 2015-2016 school year in Famagusta, were attained (42 administrator), however, only 274 of 392 teachers (69.9% of the phase) completed the questionnaire. When we look at teacher and administration staff remarks, a significant difference was found in teachers' participation in educational and administrative decisions. This difference was in favour of educational decisions. A significant difference was not met in teacher and administrative staff views on teachers' participation in school related (educational and administrative) decisions considering; gender, age, total working years as teacher, total working years at the school, task type, and education level. However, teacher views significantly changed when schools' locations change. This difference was in favour of the teachers working in rural areas. Finally, when participant teachers' and administrators' views were compared, teachers' participation in school related (educational and administrative) decisions shows a meaningful difference. Administrative staff, in comparison to teachers, stated that teachers' participation has to be more in decision making process. However, the study focused only on teacher and administrative staff views on teachers' participation in school related decision-making process in primary schools and did not consider a crucial aspect: the level of stakeholder participation. This research investigated the levels of decision-making in public primary schools in Nwoya District.

2.3 Relationship between Data Management Practices and Decision Making

In the 21st Century, organisations are expected to be more flexible and able to adjust if they are to remain competitive. The role of employees has become more

important, with greater focus being put on their involvement in decision-making at the workplace (Shaed, Ishak & Ramli, 2015). In their review of 32 articles published between 2010 and 2014, covering 24 variables, Shaed, Ishak and Ramli (2015) showed that factors such as gender, education level, work experience, organisational performance, job satisfaction, job performance, commitment, support from supervisors and the organisation, employee attitudes, sense of ownership, confidence, training, leadership, trust, motivation, and productivity were all positively linked to participation in decision-making, and these were connected to proper data management. Their work was based on secondary data, whose quality may not always be easy to confirm. Unlike their study, the current research used primary data, with checks put in place to ensure it is reliable and valid for the intended purpose.

Schifter et al. (2014) noted that using data to guide decisions has become more important in K–12 educations, yet many teachers still lack the skills to handle big and varied data sets. This means teachers are not well trained in interpreting different forms of data to track learners' progress or to adjust teaching to fit learners' needs. The authors proposed a six-step process for turning raw data into useful knowledge: collecting, organising, summarising, analysing, and synthesising it into information that can support decision-making. This process helps generate insights that, when interpreted in the right context, can guide appropriate actions in schools. However, the study focused only on teachers as decision-makers and left out other key players like School Management Committees (SMCs), headteachers, and deputy headteachers. The present study therefore brings in these groups to give a fuller picture of decision-making in Ugandan schools.

A study in Cross River State, Nigeria, looked at how the use of information and data influences the quality of decision-making by principals and library staff in

government school libraries. The findings showed that using data has a significant effect on decision-making for both groups (Edinyang, Bassey & Ushie, 2020). However, the study used an ex-post facto survey design, which makes it difficult to manipulate variables and prevents random assignment of participants (Khaldi, 2017). In contrast, this research will use a cross-sectional survey design, collecting data at a single point in time and examining multiple variables at once, giving a clearer picture of the situation.

Ndiku, Oyoo, and Owano (2014) carried out a study in Kenya on how student data is managed and used in school decision-making. They found that principals and teachers were not fully aware of the student data needed for proper planning, and that poor data management negatively affected planning and decision-making. However, their study relied only on descriptive statistics, which limits how much the findings can be applied to other schools. In contrast, the present research used both descriptive and inferential statistics to produce findings that can be generalised to a wider population.

Masha (2014) studied the use of data in strategic decision-making, the quality of those decisions, and how effectively the chosen strategies were implemented. The study highlighted that using data in strategic decisions helps make informed choices, improves overall school performance, and enhances student achievement. While Masha focused on higher education institutions, the current research will look at primary schools, which have different dynamics compared to universities.

A study on data-based decision-making in schools found that, even though schools had different areas requiring decisions and had data to support these decisions, the data was not effectively used to address the identified issues (Fitsumbirhan, Asrat & Kelkay, 2020). The study, however, used purposive sampling only, which relies on the researcher's judgment and can lead to low reliability and high bias Tajik, Golzar & Noor

(2025). In contrast, this research used both purposive and simple random sampling, which reduces bias and improves the reliability of the data collected.

This chapter looked at the literature on data management practices, decision-making, and how these two relate. It also pointed out gaps in earlier studies, including differences in findings, the tools used for data collection, methods of data analysis, research approaches, and study designs, highlighting the areas that this research addressed. The next chapter will describe the research methodology used in this study.

Chapter Three:

Methodology

3.1 Introduction

This chapter explains how the study was planned and carried out. It covers the research approach and design, the study population, sample size and sampling methods, data collection methods and instruments, data analysis techniques, quality control measures, ethical considerations, and the assumptions underlying the study.

3.2 Research Approach

In this research, a quantitative approach was used. This research was designed to be quantitative due to the need to achieve statistical analysis to permit conclusions based on numerical data (Creswell & Creswell 2017). Additionally, the quantitative approach in this study used numerical data to articulate facts and revealed relationships between study variables. Furthermore, employing quantitative methods enabled the researcher to gather a substantial amount of data for the study.

3.3 Research Design

The study used a cross-sectional survey design and gathered data from participants at a single point in time (Rahi, 2017). A cross-sectional survey design allows for a single stage of data collection and analysis intending to establish associations between variables (Wang & Cheng, (2020). The study used a quantitative method and data collected through a survey to examine the relationship between data management practices and decision making.

3.4 Population of the Study

The study population consisted of all teachers and chairpersons of school

management committees in public primary schools in Nwoya District in Northern Uganda. Teachers and the chairpersons school management committees were selected as they have the main stake in managing the day-to-day school and classroom-related data and hence making operational, tactical, and strategic decisions. The study targeted classroom teachers, deputy head teachers, head teachers, and school management committees (SMCs) in Nwoya District. Data from Ministry of Education and Sports Uganda, showed that Nwoya District had 44 Public primary schools (Ministry of Education & Sports, 2019). These schools were distributed across the eight sub-counties and three Town Councils in Nwoya District: Alero (10 Public primary schools), Lungulu (04 Public primary schools), Purongo SC (04 Public primary schools), Purongo T/C (3 Public primary schools), Got Apwoyo S/C (02 Public primary schools), Koch-Goma S/C (05 Public primary schools), Koch-Goma T/C (02 Public primary schools), Koch Lii (4 Public primary schools), and Anaka (payira) (4 Public primary schools), Anaka Town Council (04 Public primary schools), and Paminyai (02 Public primary schools) (UBOS, 2024). In total, Nwoya District had 44 head teachers, 44 deputy head teachers, and 343 classroom teachers distributed among the schools at the time of data collection. Additionally, each of the 44 government-aided primary schools had a school management committee (SMC) chairperson.

3.5 Sample Size Determination

The sample size for this study was determined using Krejcie and Morgan's (1970) table for calculating sample sizes (Appendix C). Using the table, a population of 475 was rounded to the higher side of 480, giving a sample size of 214. To cater for non-response and to improve the statistical power of the study, the researcher increased the sample size for the study by 20% (Barriball & While, 1999). Therefore, the sample size used for the study was 257. However, the researcher collected 301 responses,

exceeding the estimated sample size. This was necessary as the researcher expected to use excess data to replace invalid data.

Table 1: Sample Selected in each Category

Category	Population	Expected sample	Respondents Reached	% of the Population	Sampling Techniques
SMC Chairperson	44	44	42	95.5%	Purposive
Head teachers	44	44	44	100%	Purposive
Deputy Head Teacher	44	44	34	77.3%	Purposive
Teachers	343	181	181	100%	Simple Random Sampling
Total	475	313	301		

Source: Inspection Report (NDLG, 2022) and primary data.

A study population of 475 with and expected target of 313 was required. The sampled categories were as; SMC Chairperson 42 (95.5%), Head teachers 44 (100%), Deputy Head Teacher 34 (77.3%), Teachers 181 (52.3%) making total sampled population of 301.

3.6 Sampling Techniques

Purposive sampling was employed to select SMC chairpersons, Head teachers and Deputy Head teachers. Purposive sampling was employed as the researcher had the groups and place in mind and participants who suited the purpose of the study as they were the key decision makers and are directly concerned with formulating and implementing the school management and decision function. In two (02) public primary schools, the term of office of the SMC had expired and therefore, they were not available to responds to the questionnaires. It was thought that participants selected were better able to give the right information since their roles and responsibilities were directly in line with the information being sought to assist, considering the target number for each specific similarity among the groups about school management and functions (Alkassim

& Tran, 2016).

There are 44 school head teachers and deputy head teachers in Nwoya district public Primary schools. All the 44 deputy head teachers and head teachers were purposively sampled. This was done by gathering lists of public schools and contacts of their head teachers and deputies from Nwoya District Education and Sports Department. All the 44 head teachers and deputy head teachers were therefore reached purposively with the aim to increase detailed data and understanding on the research topic being investigated. However, of the 44 expected deputy head teachers, 8 of them were on leave for various reasons and were not available at school during the period of data collection Similarly, simple random sampling using staff rota at each school was used to identify 4 teachers at each school (equal to size for each school). Class teachers of the 44 primary schools were chosen using simple random sampling where list of teachers on duty rota were written on a ballot paper after which the target number, 4 teachers at each school (equal to size for each school) was selected. This was to give them equal chance of participating in the study.

3.7 Data Collection Methods

The method of data collection method used in this research is questionnaires survey to collect information on data management practices and decision making in primary schools in Nwoya District. Questionnaire survey was used because it helps in minimizing researcher biases and eliminates fear by some participants (Saul, 2018).

3.8 Data Collection Instruments

This study utilised primary data collected through a structured questionnaire, which was specifically designed to gather responses suitable for quantitative analysis. According to Glen (2003), a questionnaire is any written tool containing statements or

questions presented to respondents, who provide answers by selecting from pre-determined options.

The study used questionnaires for collecting data from participants (Appendix D). The conceptual framework was used as a foundational roadmap and defined key variables, connects ideas, and establishes relationships that translate abstract theories into actionable components. The questionnaire consisted of three main parts of demographic data, data management practices and decision-making in schools. The data management practice is divided into four parts of data collection practice with 9 items, data processing practices with 8 items, data interpretation practices with 8 items, and data security practices with 8 items. Under decision-making, the questionnaire is divided into three sections, namely strategic decision-making with 7 items, tactical decision-making with 8 items and operational decision-making containing 8 items.

3.9 Administration Procedure

An introductory letter (Appendix F) was issued by the Dean of Faculty of Education and Humanities, Gulu University on Monday 22nd February 2021 for purpose of introduction to the participants in the study. Questionnaires were administered to the participants to collect quantitative data on Data Management practices and decision making in public primary schools in Nwoya district. The questionnaires were administered by the researcher and three research assistants from Tuesday 23rd February 2021 to Friday 2nd April, 2021.

3.10 Quality Control

Content validity index. Validity explained the degree of accuracy of the data collection instruments for gathering data (Taherdoost, 2016). The quality of research depended on the design of research data collection instruments and the application of

the instrument in data collection. In this study, the researcher used Content Validity Index (CVI) measures to check the quality of the contents of the questionnaire before administration to study participants. Three experts, including one teacher and two administrators, were requested to rate the item statement in the questionnaire to decide if they were suitable or not to the concepts being studied. This was done to guarantee the quality of the data to be collected (Bolarinwa, 2015). The validity of the questionnaire was determined by calculating the Content Validity Index (CVI), where three experts in school administration acted as inter-judges who vetted the contents of the questionnaire. The CVI of the instrument was calculated using the formula provided below.

Table 2: Content validity index

Item	Judge 1	Judge 2	Judge 3
Rated Relevant/Total number of items	51/56	50/56	53/56
Rating	0.910	0.892	0.926
Average			0.909

The average content validity index rating for the three judges was 0.909 showing higher level of content validity. For attitudinal scale, Rahi (2017) argued that any item/ instrument which has an averaged CVI index of 0.6 or above is accepted as valid and can thus be used for data collection.

Reliability statistics. Reliability refers to how consistently a research instrument measures what it is supposed to measure (Taherdoost, 2016). In this study, Cronbach's Alpha was used to calculate the reliability coefficient of the questionnaire items. Cronbach's Alpha is widely regarded as the best way to check reliability, especially for questionnaires using a Likert scale (Singh, 2017). Table 3 shows the Cronbach's Alpha values for the main constructs in this study.

Table 3: Cronbach's Alpha reliability statistics

Construct	Number of items	Cronbach Alpha value
Data collection practices	9	0.805
Data processing practices	8	0.847
Data interpretive practices	8	0.862
Data security practices	8	0.848
Decision-making	2	0.922
Average reliability	N	0.854

The reliability coefficient was calculated at a 95% confidence level. Schober et al. (2018) note that a correlation coefficient of 0.8 or above shows a very strong relationship. The questionnaire produced a correlation coefficient of +0.8, and was therefore deemed reliable. As shown in Table 3, all Cronbach's Alpha values for the questionnaire constructs are above 0.8 ($r > 0.8$), indicating a high level of internal consistency. This means that the test scores are largely free from random measurement errors (Reza, Puspita & Oktaviani, 2021).

As shown in Table 3, the Cronbach Alpha coefficient values of the questionnaire are all above 0.8. It is recommended that the Cronbach Alpha coefficient value of 0.7 and above indicates a reliable questionnaire (Reza, Puspita & Oktaviani, 2021).

3.11 Data Management

After collecting data from the field, the researcher sorted the questionnaires and ensured that labels were consistent and accurate. In this study, all the questionnaires were found to be usable. The researcher converted the raw quantitative data from the questionnaires by entering the data into a created data entry form, the data was first entered in Excel and then transferred to SPSS version 16.0 for analysis. Once the data was entered into the SPSS template, the computerized data were further checked for completeness, correctness, and consistency using SPSS frequency function and cross-

tabulation, respectively.

For checking completeness and correctness, the researcher performed frequency functions under descriptive analysis for all the study variables and carefully checked all frequency tables visually. Where there were problems in data entry, the researcher referred back to the questionnaires and corrected all missed entries. To ensure consistency, the researcher performed cross-tabulation statistics for demographic variables to detect inconsistencies, such as cross-tabulations for age and position of respondents, and age and duration of service. Fortunately, the researcher found no inconsistencies in the data. During data entry, any missing data, particularly in the Likert scale questions from the original questionnaires, were declared as missing data. Data analysis for the study commenced only after data were checked for completeness, correctness, and accuracy.

In the analysis, ordinal data were assigned numerical scores. These scores are treated as having both directionality and equal spacing, although individual Likert-type items are typically considered ordinal (Chen & Liu, 2020). This is because while the items have a clear rank order, the intervals between them are not necessarily uniform.

3.12 Data Analysis Methods

Data analysis involves summarizing and organizing collected data to an acceptable standard for accurate interpretation and reporting (Amin, Hertzberg, Kaiser, & Karouby, 2015). In this section, analysis techniques were presented by hypothesis.

3.12.1 Hypothesis 1

To test the hypothesis that there is no significant difference in data management practices in public primary schools in Nwoya District. To arrive at a decision on the levels of each data management practices, descriptive statistics containing frequency

distribution tabulation and measure of central tendency (the mode) were performed. Data management practice score (mode) of 1- 2 was coded poor, i.e, disagreement with the Likert scale affirmative statements, and 4-5 as good practices (i.e, agreeing with the Likert scale affirmative statements). To determine whether there were significance differences among the components of data management practices, Chi square Goodness-of-Fit was used.

3.12.2 Hypothesis 2

For hypothesis 2, the Chi-square Goodness-of-Fit test was employed to examine the difference between levels of decision making in public primary schools. In this analysis, the calculated Chi Square value will be cross-referenced with the critical Chi-Square distribution table based on the study's degrees of freedom, calculated as ($df = k - 1$), where k represents the number of response categories and *df* is the degree of freedom. All statistical inferences will be tested at a 95% confidence level. The statistical decision to reject or retain the null hypothesis will be determined by the resulting asymptotic significance value *(p)*-value: A *p*-value below 0.05 was interpreted as indicating a statistically significant relationship in the levels of decision making, whereas a *p*-value above 0.05 suggested no statistically significant association in the level of decision making.

3.12.3 Hypothesis 3

For hypothesis 3, multiple regression analysis was employed, and a regression model summary was generated to establish the coefficient of determination (R-squared) and the statistical significance levels (*p-values*) in order to examine the relationships among the study variables (Plonsky & Ghanbar, 2018). In addition, Pearson's correlation coefficient was computed to measure the strength and direction of

association between the variables under investigation. Specifically, the correlation analysis assessed the relationships between data collection practices and decision making, data processing practices and decision making, data interpretation practices and decision making, as well as data security practices and decision making in public primary schools. In this study, a *p-value* of less than 0.05 was considered to indicate a statistically significant relationship, whereas a *p-value* greater than 0.05 denoted the absence of a statistically significant relationship with the dependent variable.

3.13 Ethical Considerations

The researcher got an introductory letter from the Faculty of Education and Humanities, Gulu University, which was shown to the respondents before collecting data. The researcher then introduced himself, explained the purpose of the study, and made it clear that participation was completely voluntary. Informed consent was secured by requesting respondents to sign the consent form provided (Appendix E). Respondents were informed that confidentiality would be maintained, with data used solely for the study. Assurance was given that their real names would not be mentioned to ensure anonymity, using pseudonyms instead.

3.14 Assumptions of the Study

In this study, it was assumed that each data management practice is an independent variable that affects the decision-making in primary schools in Nwoya District.

3.15 Limitations

This study was a quantitative study using a survey and a structured tool to collect data from participants. Using a quantitative survey is limited because qualitative perceptions of participants about data management practices and decision-making cannot be captured. This could have affected the depth of understanding of the study

problem. In addition, the study purposively selected head teachers, deputy head teachers, and school management committee chairpersons. Teachers were selected randomly, leaving out other stakeholders like students and parents. Although the regression model has explained the contribution of data management practices on decision-making, the power of the selected variables was low.

Chapter Four

Data Presentation, Analysis and Interpretation

4.1 Introduction

The Chapter provides the demographic characteristics followed by the results and interpretation for each hypothesis

4.2 Demographic Characteristics of the Respondents

The demographic characteristics were analysed to provide context in which the results should be interpreted.

Table 4: Demographics (N=301)

Variable		Frequency	Percentage
Gender	Male	194	64.5
	Female	107	35.5
Position	Education Assistant II	179	59.5
	Senior Education Assistant	14	4.7
	Deputy Head Teacher	22	7.3
	Head teacher (HT)	44	14.6
	Chairperson SMC	42	13.9
Age group	18-22 years	1	0.3
	23-27 years	26	8.6
	28-32 years	30	10.0
	33-37 years	72	23.9
	38-42 years	65	21.6
	43-47 years	49	16.3
	48 years +	58	19.3
Education level	Post Graduate Diploma	1	0.3
	Degree	25	8.3
	Diploma	109	36.2
	Certificates	126	41.9
	UACE	17	5.6
	UCE	23	7.6
Duration in service	1 year and below	46	15.3
	2-5 years	116	38.5
	6-9 years	88	29.2
	10-13	30	10.0
	14-17 years	7	2.3
	18 years and above	14	4.7

Majority of the respondents were male, 192 (64.5%) indicating that there were more male teachers sampled, hence male teachers formed majority of sampled population in the study while females constituted 107 (35.5%) of the sample indicating that the respondents were mixtures of male and female, although there were few female teachers sampled compared to male teachers, hence female teachers formed minority population in the study. The average age of respondents was 43 years old with the majority in the category of age bracket 33-37 years indicating that the participants in the study were the adult population who can understand and objectively respond to the questionnaire and their responses generated data for the study. Most respondents to questionnaire were Education assistants II 179 (59.5%) and the head teachers 44 (14.6%) of which the majority were holders of certificate in education (education assistant II) 126 (41.9%), followed by holders of Diploma (GV) 109 (36.2%) indicating that they can understand and use data daily at school to make decisions. Likewise, the majority of the respondents, 116 (38.9%), had served in their specific position for at least 2-5 years, followed by those who served for 6-9 years, indicating that most of the respondents were already acquainted with the operational, administrative and management settings in the schools they were assessed as shown in Table 4.

4.3 Data Management Practices

Data management practices were analysed by each component to ascertain the practices in public primary schools in Nwoya district. In order to test the hypothesis that there is no significant difference in data management practices in public primary schools in Nwoya District. A Chi square test of Goodness-of-Fit was carried out after checking that the major assumptions of the X^2 – test were met. The results are presented in Table 5 to Table 9.

Table 5: Results on Data Collection Practices

Item	S.D (1)	D (2)	NS (3)	A (4)	SA(5)	Min	Max	Mode	Chi^2	*df*	*p*-value
This school always collects data to enable the generation of information on and for the operation of the school.	10	24	23	183	61	1	5	4	337.123[a]	4	0.000
In this school, data identification is always done before data collection is done.	15	33	64	155	34	1	5	4	207.156[a]	4	0.000
In this school, data are always collected based on their relevance to the school stakeholders.	21	41	46	143	50	1	5	4	150.611[a]	4	0.000
Data collected is always consistent and reliable; therefore, the school depends on it for decision-making.	20	32	52	131	66	1	5	4	124.997[a]	4	0.000
This school always collects data on time to allow for timely data processing.	14	40	156	44	47	1	5	3	203.067[b]	4	0.000
Most data collected in this school always meets its exact intended purpose.	15	47	63	141	35	1	5	4	155.960[a]	4	0.000
This school has trained personnel who manage all the data that is collected.	20	85	57	107	32	1	5	4	86.824[a]	4	0.000
This school always ensures there is accuracy and completeness of data when collecting data.	12	42	65	147	35	1	5	4	180.179[a]	4	0.000
This school has specific data collection tools that are always used for collecting data.	25	47	71	116	40	1	5	4	158.640[c]	5	0.000

SD=Strongly Disagree, *D*= Disagree, *NS*=Not Sure, *A*= Agree, and *SA*= Strongly Agree

NB: Mode (1-3 coded as disagree, Mode (4-5) coded as agree), df=degree of freedom Agree

Concerning data management practices relating to data collection practices, the data analysis shows that the majority of respondents generally agreed that they practice these data collection practices; data collection, data identification, data relevance, data consistency, data purpose and data personnel. were practiced. From the responses in the nine (9) statements, the majority of respondents agreed on 08 data collection practices (mode =4). Least practised data collection practices were noted on the timely data collection to allow for timely processing (mode =03), Table 5. The test statistics in Table 5 showed that there were significant differences among schools in data collection *p-value* <0.05.

Table 6: Results on Data Processing Practices

Item	S.D (1)	D (2)	NS (3)	A (4)	SA (5)	Mode	*Chi2*	*df*	*p-value*
In this school, data cleaning is always done on the data collected to detect inaccurate data.	24	58	90	117	12	4	128.784[a]	4	0.000
This school always does data coding for all qualitative data collected.	24	57	109	97	14	3	119.449[a]	4	0.000
In this school, data is always transformed from one data format to another.	24	61	108	89	19	3	101.708[a]	4	0.000
This school always caters to missing data in the data set of the school.	23	59	68	132	19	4	137.854[a]	4	0.000
This school always does its data processing using computer software.	68	92	51	73	17	2	52.937[a]	4	0.000
Proper data entry is always done for all data collected in this school.	30	64	65	117	24	4	91.433[b]	4	0.000
This school always analyses its data using descriptive statistics like, frequency tables, graphs, charts, etc.	31	68	72	106	24	4	74.100[a]	4	0.000
In this school, processed data is always shared with the stakeholders to be utilized in making decisions in the school.	16	51	47	146	41	4	165.163[a]	4	0.000

SD=Strongly Disagree, D= Disagree, NS=Not Sure, A= Agree, and SA= Strongly Agree
NB: Mode (1-2) coded as disagree, Mode (4-5) coded as agree), df=degree of freedom Agree

As shown in Table 6, data processing practices were averagely practiced in the items' scores. Of the 8 statements, most respondents agreed (mode=4) to have always practised the following data processing practices: data cleaning, handling missing data,

sharing of processed data with stakeholders, proper data entry, and data analysis using descriptive statistics. However, respondents were not sure whether the data processing practice of data coding for all qualitative data collected and data transformation from one format to another was being practised. On the other hand, most respondents disagreed that data processing using computer software was not practised in schools. The test statistics in Table 6 showed that there were significant differences among schools in data processing *p-value* <0.05.

Table 7: Results on Data Interpretation Practices

Item	S.D (1)	D (2)	N S (3)	A (4)	S.A (5)	Min	Max	Mode	Chi2	*df*	*p-value*
In this school, data is always interpreted and explained to stakeholders before it is put to use.	15	35	32	171	48	1	5	4	264.100[a]	4	0.000
This school's stakeholders always compare and contrast its different data sets to predict trends in performance.	14	60	60	141	26	1	5	4	163.336[a]	4	0.000
During data interpretation, outlier data (data that are unique from the rest) are always identified.	16	47	101	110	25	1	5	4	207.840[b]	5	0.000
In this school, existing data are reinterpreted and used to make future trend predictions	11	46	64	151	29	1	5	4	196.924[a]	4	0.000
In this school, data interpretation limitations are always addressed to ensure the data meets its intended purpose.	15	44	75	135	30	1	5	4	151.017[c]	4	0.000
This school stakeholder always tests the significance/importance of the data collected.	24	42	67	133	35	1	5	4	126.625[a]	4	0.000
In this school, stakeholders always present data in graphs, charts, and tables to ensure easy visualization and interpretation.	33	62	114	73	19	1	5	3	91.342[a]	4	0.000
In this school, stakeholders always use information from data interpretation to make decisions.	14	56	65	140	26	1	5	4	161.342[a]	4	0.000

SD=Strongly Disagree, *D*= Disagree, *NS*=Not Sure, *A*= Agree, and *SA*= Strongly NB: Mode (1-2) coded as disagree, Mode (4-5) coded as agree), df=degree of freedom Agree

Of the 8 statements, the majority of respondents agreed (mode=4) that there were

good practices in their schools concerning data interpretation practices. The majority of the respondents also disagreed (mode=03) on the aspects of presenting data in graphs, charts and tables to ensure easy visualization and interpretation, and always using information from data interpretation to decide on their schools. The test statistics in Table 7 showed that there were significant differences among schools in data interpretation practices, *p*-value <0.05

Table 8: Results on Data Security Practices

Item	S.D (1)	D (2)	N S (3)	A (4)	S. A (5)	Min	Max	Mode	Chi2	*df*	*p-value*
In this school, there is a secure data storage instruments used for storing data.	27	73	52	113	36	1	5	2	78.186[a]	4	0.000
This school's data are always backed up using files, computers, and or computerized devices like; external hard disk, and flask disk and on the internet.	33	57	38	131	42	1	5	4	109.415[a]	4	0.000
There is a system in place that always limits both physical and digital access to critical school data	32	81	82	87	19	1	5	3	68.419[a]	4	0.000
There are arrangements in place that accurately identifies data users before they have access to school data.	27	68	78	110	18	1	5	3	95.362[a]	4	0.000
There are rules and regulations governing using the data of this school.	22	66	60	121	32	1	5	4	99.415[a]	4	0.000
There is a practice in place to eliminate sensitive school data that is no longer necessary for ongoing activities.	23	77	86	87	28	1	5	3	99.415[a]	4	0.000
Data are converted into different forms and stored in the different formats Like, text converted into Audio and or video recordings and vice- versa and stored.	52	81	62	89	17	1	5	3	53.136[a]	4	0.000
In this school, data is always memorized by the stakeholders and are reproduced when required.	32	61	49	130	28	30	1	5	113.833[b]	4	0.000

SD=Strongly Disagree, *D*= Disagree, *NS*=Not Sure, *A*= Agree, and *SA*= Strongly Agree

NB: Mode ((1-2) coded as disagree, Mode (4-5) coded as agree)

Table 8 above indicates practices relating to data security. Of the 8 statements, the majority of respondents agreed that good practices were itemized on having back-up using files (mode=04), having rules and regulations governing the use of data of the school (mode =04 and ensuring data is always memorized by the stakeholders and is reproduced when required (mode=04). Meanwhile majority of respondents disagreed and were not sure (mode ranging from 1-3) of having these practices with regards to data interpretation in the areas of; having secure data storage instruments for use for storing data., having a system in place that always limits both physical and digital access to critical school data, having a practice in place to eliminate sensitive school data that is no longer necessary for ongoing activities and ensuring data are converted into different forms and stored in the different formats. The test statistics in Table 8 showed that there were significant differences among schools in data security practices, *p-value* <0.05.

Table 9: Test of significance on data management practices

Test Statistics				
	Data_collection	Data_processing	Data_interpretation	Data_Security
Chi-Square	234.930[a]	118.392[b]	210.551[c]	84.478[b]
Df	34	28	30	28
Asymp. Sig.	.000	.000	.000	.000

Table 9 above shows the cross tabulation of chi square test of goodness of fit showing association between components of data management practices. Overall the *p-value* across all components were less than 0.05 ($p<0.05$). We therefore reject the null hypothesis and conclude that there are significance differences on data management practices (data collection, data processing, data interpretation and data security) across all the public primary schools in Nwoya district.

4.4 Decision-making in Public Primary Schools in Nwoya District

In order to test the hypothesis that there is no significant difference in the levels

of decision-making in public primary schools in Nwoya District. A Chi square test of Goodness-of-Fit was carried out after checking that the major assumptions of the χ^2 – test were met. The results are presented in Table 10 to Table 13.

Table 10: Strategic Decision-Making

Item	S.D (1)	D (2)	NS (3)	A (4)	S.A (5)	Min	Max	Mode	Chi^2	*df*	*p-value*
The School Management Committee (SMC) of this school makes all strategic decisions required for the long-term operation of this school.	14	40	44	160	43	1	5	4	216.957[a]	4	0.000
In this School, SMC makes resource allocation decisions with input of information from school data.	17	34	53	159	38	1	5	4	213.601[a]	4	0.000
In this School, SMC build consensus with inputs from other levels of decision-making, but they make the final decisions.	9	44	47	149	52	1	5	4	182.904[a]	4	0.000
The SMC of this school always vote to choose an item/action to become a decision of management to implement.	12	34	62	146	46	1	5	4	176.267[b]	4	0.000
The SMC of this school delegate their decision to be taken by the administrators of this school.	12	29	56	150	54	1	5	4	189.648[a]	4	0.000
The SMC of this school always communicate timely the decisions they have made to the administrators for implementation.	13	40	38	169	41	1	5	4	254.731[a]	4	0.000
The SMC of this school always evaluate decisions they have made and provides recommendations to the administration for implementation.	14	41	62	146	38	1	5	4	172.106[a]	4	0.000

SD=Strongly Disagree, D= Disagree, NS=Not Sure, A= Agree, and SA= Strongly Agree
NB: Mode (1-2) coded as disagree, Mode (4-5) coded as agree)

Table 10 shows that all (100%) respondents agreed (mode=4) that strategic decision-making was practiced across all test scores. These scores range from the SMC of this school making all strategic decisions necessary for its long-term operation,

including resource allocation decisions based on data from the school, to SMC building consensus with input from other levels of decision-making. However, they make the final decisions, often voting to select an item or action for management implementation, delegating decision-making roles to school administrators and SMC. Similarly, the SMC communicates their decisions to administrators in a timely manner for implementation. The SMC also consistently evaluates the decisions they have made and provides recommendations to the administration for execution. The test statistics in table 10 showed that there were significant differences among schools in Strategic Decision-Making, *p-value* <0.05

Table 11: Tactical Decision Making

Items	S.D (1)	D (2)	NS (3)	A (4)	S.A (5)	Min	Max	Mode	Chi2	*df*	*p-value*
The administrators of this school make all decisions required for the medium-term operation of this school.	13	35	33	181	39	1	5	4	309.714[a]	4	0.000
The administrators of this school make medium-term decisions from strategic direction from the School Management Committee (SMC).	8	30	46	178	39	1	5	4	301.741[a]	4	0.000
The administrators build consensus with inputs from departments, but the administrators make the final decisions.	10	42	43	162	44	1	5	4	228.784[a]	4	0.000
The administrators vote to choose the course of action to form tactical decisions.	8	46	60	145	42	1	5	4	173.568[a]	4	0.000
The administrators of this school are able to use data quickly and effectively to make decisions	9	30	60	149	53	1	5	4	190.545[a]	4	0.000
The administrators of this school fully delegate the decision to departments, the department discuss, discern, and decide on behalf of the school.	14	27	35	161	68	1	5	4	165.030[a]	4	0.000
The administrators of this school timely communicate decisions made to the teachers for implementation	10	27	35	161	68	1	5	4	240.512[a]	4	0.000
The administrators of this school always monitor and evaluate decisions made and make necessary recommendations to the stakeholders	4	38	36	164	59	1	5	4	249.382[a]	4	0.000

SD=Strongly Disagree, D= Disagree, NS=Not Sure, A= Agree, and SA= Strongly Agree

NB: Mode (1-2) coded as disagree, Mode (4-5) coded as agree)

Table 11 illustrates the levels of tactical decision-making at the school level. All respondents (mode=4) agreed that tactical decisions were being implemented across all scores by teachers, with school administrators making all decisions required for medium-term operation (*freq*=181, mode=4). Teachers were also able to use data quickly and effectively to make operational decisions (*freq*=178, mode=4), and they consistently made cost-effective operational choices because they rely on available data to base their decisions (*freq*=162, mode=4), The administrators vote to choose the course of action to form tactical decisions (*freq*=145, mode=4), administrators of school are able to use data quickly and effectively to make decisions (*freq*=149, mode=4), administrators of school fully delegate the decision to departments, the department discuss, discern, and decide on behalf of the school (*freq*=161, mode=4), The administrators of this school timely communicate decisions made to the teachers for implementation (*freq*=161, mode=4) and administrators of school always monitoring and evaluating decisions made while making necessary recommendations to the stakeholders (*freq*=164, mode=4). The test statistics in Table 11 showed that there were significant differences among schools in taking tactical decision making, *p-value* <0.05

Table 12: Operational Decision Making

Item	SD (1)	D (2)	NS (3)	A (4)	SA (5)	Min	Max	Mode	Chi2	*df*	*p-value*
Teachers of this school make decisions on day-to-day activities of the school.	12	34	23	186	46	1	5	4	339.216[a]	4	0.00
This school has a simple repetitive routine arrangement that guides day to day operational decision making.	11	37	41	158	54	1	5	4	214.797[a]	4	0.00
Teachers of this school are able to use data quickly and effectively to make operational decisions.	9	47	39	154	52	1	5	4	201.176[a]	4	0.00
Teachers of this school always base their decisions making on how the previous decisions were made to make current decisions	5	48	36	165	47	1	5	4	248.153[a]	4	0.00
Teachers of this school always make cost-effective operational decisions because they use the available data to base their decisions.	4	54	54	159	30	1	5	4	231.043[a]	4	0.00
Teachers of this school timely and effectively implement decisions made at different levels.	8	32	47	152	62	1	5	4	201.409[a]	4	0.00
Teachers of this school communicate (report) timely and effectively on decisions they have made and or implemented to the stakeholders.	7	32	39	177	46	1	5	4	297.654[a]	4	0.00
The teachers of this school always monitor and evaluate decisions made and make necessary recommendations to the stakeholders	11	34	41	164	50	1	5	4	239.233[b]	4	0.00

SD=Strongly Disagree, D= Disagree, NS=Not Sure, A= Agree, and SA= Strongly Agree
NB: Mode (1-2) coded as disagree, Mode (4-5) coded as agree)

Table 12 shows operational decision-making level at the school level. All (mode=4) respondents agreed that operational decisions were being implemented across all scores by teachers ranging from timely and effective implementation of decisions made at different levels

and communicating (reporting) timely and effectively on decisions they have made and/or implemented to the stakeholders (*freq*=186, mode=04), Teachers of the school being able to use data quickly and effectively to make operational decisions (*freq*=159, mode=04), as well as always making cost-effective operational decisions because they use the available data to base their decision. The test statistics in Table 12 showed that there were significant differences among schools in implementing operational decision making, *p-value* <0.05

4.4.1 Level of Decision making in public primary schools in Nwoya

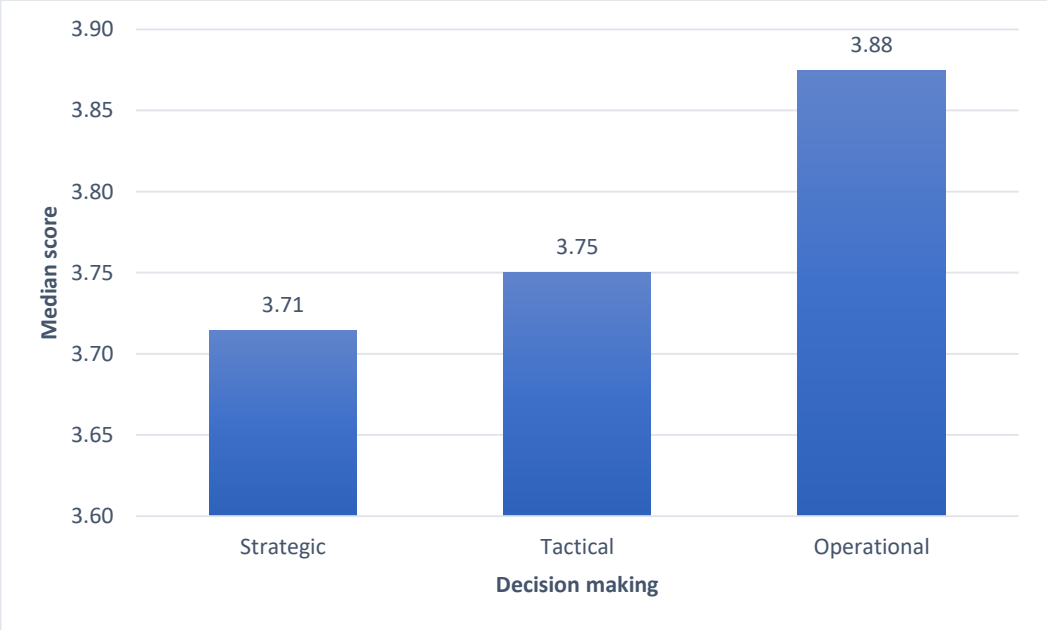


Fig. 2 Median Score on Decision Making levels in Nwoya Public Primary Schools

Figure 2 showed that operational decision making was highly practiced in Nwoya public primary schools. This was followed by tactical decision making. Strategic decision-making levels was least practices in schools.

Table 13 showing association of components of decision making in Nwoya district public primary schools

Test Statistics			
	strategic decision	Tactical decision	Operational decision
Chi-Square	241.977[a]	156.203[b]	151.538[b]
df	27	25	25
Asymp. Sig.	.000	.000	.000

The chi-square test results presented in Table 13 indicate that the level of strategic, tactical, and operational decision-making in public schools in Nwoya District were all statistically significant. Consequently, we reject the null hypothesis two (H_2) and conclude that significant differences exist in decision-making levels among public primary school teachers, administrators, and management. Specifically, operational decision-making recorded a chi-square value of 151.538[b] with a *p*-value < 0.05, confirming the observed differences across the stakeholder groups.

4.5 Relationship between data management practices and decision making in public primary schools in Nwoya District

In order to test the hypothesis that there is no significant relationship between data management practices and decision-making in public primary schools in Nwoya District, the Pearson correlation analysis and multiple regression at 95% confidence interval were used. Prior to using the analysis, the data were checked for the satisfaction of the assumptions. The results are presented in Table 15 to Table 17.

Regression Analysis showing relationship between data management practices and Decision making

Table 14: Regression Model Summary

Model Summary[b]

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	*F* Change	*df1*	*df2*	*Sig. F* Change
1	.720[a]	.518	.511	.42437	.518	79.502	4	296	.000

a. Predictors: (Constant), data security, data collection, Data interpretation, data processing
b. Dependent Variable: Decision making

In Table 14 above, Multiple Regression Analysis was used to analyse the four main data management practices variables of data collection practice, data processing practice, data interpretation practice, and data security practice on a single computed variable of level of decision-making in public primary schools. The regression model and regression analysis are presented in Tables 15 and 16.

Table 15: ANOVA[a]

Model		Sum of Squares	*Df*	Mean Square	*F*	Sig.
1	Regression	57.271	4	14.318	79.502	
	Residual	53.307	296	0.180		0.000[b]
	Total	110.578	300			

a. Dependent Variable: Decision making
b. Predictors: (Constant), data security, data collect, data interpretation, data processing

In Table 15, the analysis showed a good model summary: F (1,296) = 79.502, adjusted R squared=0.413 and R squared=0.405, meaning the model can predict decision-making level by 40.5%. In addition, multiple regression analysis was performed to measure the relationship between data management practice and decision-making as indicated in Table 15. The model also satisfied the assumption of multi-collinearity (VIF=1.94, 2.894).

Table 16: Regression Coefficients

Coefficients[a]									
Model	Unstandardized Coefficients		Standardize Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
(Constant)	1.323	.135		9.778	.000	1.057	1.589		
DCP	.286	.046	.336	6.239	.000	.196	.376	.561	1.782
DPP	-.110	.055	-.138	-2.005	.046	-.218	-.002	.346	2.892
DIP	.282	.047	.356	6.012	.000	.190	.374	.464	2.155
DSP	.228	.042	.303	5.418	.000	.145	.311	.522	1.914

a. Dependent Variable: Data-driven Decision making

Key: Data Collection Practice; DCP – Data Processing Practice; DIP – Data Interpretation Practice; DSP – Data Security Practice.

The multiple linear regression model revealed that, with the exception of data processing practices, all the independent variables had positive coefficients. The findings indicated that significantly data management practices associated with decision making in public primary schools in Nwoya, these included data collection, data interpretation, and data security practices. Specifically, a one (01)-unit increase in data collection practices was associated with a 0.286-unit increase in the level of decision-making mean score ($\beta = 0.286$, CI = 0.196–0.376, $p < 0.05$). Similarly, a one (01)-unit increase in data interpretation practices corresponded to a 0.282-unit increase in the level of decision-making mean score ($\beta = 0.282$, CI = 0.190–0.374, $p < 0.05$). Furthermore, a one (01)-unit increase in data security practices resulted in a 0.228-unit increase in the decision-making mean score ($\beta = 0.228$, $CI = 0.145–0.311$, $p < 0.05$). Conversely, the analysis showed that a one (01)-unit increase in data processing practices was associated with a 0.110-unit decrease in the level of decision-making mean score ($\beta = -0.110$, $CI =$

-0.218 to -0.002, $p < 0.05$), suggesting that this variable was not a significant predictor of decision making in the study context.

Table 17: Pearson correlation analysis

N=301	DCP	**DPP**	DIP	DSP	DMP
Data Collection Practice (DCP)	1				
Data Processing Practice (DPP)	0.640**	1			
Data Interpretation Practice (DIP)	0.568**	0.699**	1		
Data Security Practice (DSP)	0.439**	0.672**	0.584**	1	
Decision Making (DM)	0.583**	0.530**	0.628**	0.566**	1

**. Correlation is significant at the 0.05 level (2-tailed). Key: DCP – Data Collection Practice; DPP –Data Processing Practice; DIP – Data Interpretation Practice; DSP – Data Security Practice; DM –

Results presented in Table 17 show that data collection practices were positively correlated with decision making, $r(301) = 0.583$, $p < 0.05$; data processing practices were positively correlated with decision making, $r(301) = 0.530$, $p < 0.05$; data interpretation practices were positively correlated with decision making, $r(301) = 0.628$, $p < 0.05$; and data security practices were positively correlated with decision making, $r(301) = 0.566$, $p < 0.05$. These findings indicate that all the variables were significantly correlated both among themselves and with decision making. Consequently, the null hypothesis two (H_{o2}) was rejected, leading to the conclusion that there exists a positive relationship between data management practices and decision making. This implies that improvement in data management practices specifically in the areas of data collection, data processing, data interpretation, and data security enhances the quality of decision making at all levels in public primary schools.

4.6 Summary of Findings

The study determined the relationship between data collection practice, data processing practice, data interpretation practices, data security practices and decision making in public primary schools. The correlation analysis revealed that all study variables were significantly correlated with each other and with the level of decision-making in primary schools. Positive correlations existed between data interpretation practices, data security practices, data collection practices, and decision-making in primary schools. When regression analysis was performed, data interpretation practice emerged as the strongest predictor and was positively and significantly related to decision-making, followed by data collection practices and data security practices. Data processing practices, however, was not significant and was negatively related to decision-making. Thus, the interpretation of the regression analysis suggested that improvements in data interpretation, collection, and security practices could enhance decision-making in primary schools, while data processing practices could potentially reduce it.

Chapter Five

Discussion, Conclusions, and Recommendations

5.1 Introduction

This study aimed to examines how data management practices affect decision-making in public primary schools in Nwoya District, Northern Uganda. This chapter presents the key findings in relation to the research objectives and discusses the results in the context of existing literature. It also presents the conclusions of the study, provides recommendations based on the findings, and suggests areas for further research.

5.2 Summary of Findings

5.2.1 Data Management Practices

The cross tabulation of Chi Square Test of Goodness-of-Fit on difference between components of data management practices (data collection, data processing, data interpretation, data security). Overall the *p-value* across all components were less than 0.05 ($p<0.05$). Hence, the null hypothesis is reject and concluded that there are significance differences on data management practices across all the public primary schools in Nwoya district.

5.2.2 Level of Decision Making

The Chi-Square Test results indicated that the levels of strategic, tactical, and operational decision-making in public schools in Nwoya District were all statistically significant. Hence, the null hypothesis two (H_2) is rejected and objective two concluded that there are significant differences in decision-making levels among public primary school teachers, administrators, and management.

5.2.3 Relationship Between Data Management Practices and Decision Making

The Multiple Linear Regression Analysis revealed that, three independent variables (data collection, data interpretation, and data security practices) had positive coefficients, indicating that data management practices significantly associated with decision making. Generally, an increased implementation of these practices in schools are associated with increase in the quality of decision-making. Conversely, the analysis showed that an increase in data processing practices was associated with a decrease in the level of decision-making, suggesting that in this study, this variable was not a significant predictor of decision making.

5.3 Discussion of Results

5.3.1 Data Management Practices

This study demonstrated that there was a significant difference in data management practices across the mechanisms of data collection, data processing, data interpretation and data security practices, implying that they were practiced on different scales among the schools. Specifically, data collection was the most practiced in Nwoya public primary schools. This is linked to day-to-day operational decisions in schools that teachers, administrators and managers make. Silva, et al. (2021) observed that although schools frequently engage in data collection, the systematic monitoring of academic progress is often neglected. Their findings further revealed that the use of data to inform instructional or intervention decisions is not embedded within regular school practices. Similarly, Ruble, McGrew, Wong, and Missall (2018), drawing from the theory of planned behaviour, examined three determinants of teachers' behavioural intention to collect data: attitudes towards data collection, social norms supporting data collection, and perceived behavioural control over data collection. Their study established that all three factors were positively correlated with teachers' reported

intentions to collect data. However, only perceived behavioural control in relation to barriers was found to have a positive association with actual data collection practices.

In this study, poor data management practices were noted in the component of data processing, interpretation and security practices. Similar findings from various studies done reveals that poorly practised components of data management (Wagner et al., 2021, Zagallo et al., 2016, Owan et al.,2020).

Data management practices on schools should generally involve the collection, analysis, and use of student information to inform decision-making and improve educational outcomes. These practices include utilising data from assessments, attendance records, and disciplinary actions to guide instruction, track learners progress, and allocate resources effectively. The implementation of these practices can vary, with some schools using systems like School Education Management Information Systems (EMIS) while others rely on manual record-keeping. Most public primary school's adherence to data sharing on EMIS is overwhelming with challenges to analysis and interpretation.

5.3.2 Level of Decision Making

The second Hypothesis examined whether there were significant differences in the levels of decision-making within public primary schools in Nwoya District. The study established that a statistically significant difference exists in decision-making levels across public primary schools. Analysis of strategic, tactical, and operational decision-making levels revealed notable variations between classroom teachers, school administrators, and management, indicating that decision-making authority and involvement are not uniformly distributed among the different categories of stakeholders. Operational (day-to-day) decision was majorly practiced by classroom teachers, followed by tactical decision by School administrators and strategic decision

by school management. School administrators hold a substantially higher level of influence when it comes to critical strategic choices, often leaving management with limited input or decision-making power in such areas yet this was least practiced. In schools, data-driven decision making can occur at multiple levels, including individual student level (classroom), grade level, school-wide, and district-wide; with teachers using data to inform individual student instruction, while administrators analyse data across larger groups to make decisions about resource allocation and school-wide interventions. A study on creating a system for data-driven decision-making, using the principal–agent framework, suggested that school-level educators need both support from the system and enough autonomy to make decisions based on data that suit their specific school context (Wohlstetter, Datnow, & Park, 2008).

Sarafidou and Chatziioannidis (2013) found that teachers were highly involved in decisions related to learners and teaching matters, but had limited involvement in managerial decisions. This gap in participation highlighted significant disparities across decision-making areas. Similarly, the differences seen in data-based decision-making in schools in Nwoya District point to the need for more structured professional development in data use, with a focus on strengthening school leadership. Supporting this, Yibrie (2019) stressed that school inspection processes should better respond to school improvement needs by integrating data-based decision-making and making it a central part of school culture.

5.3.3 ***Relationship between data management practices and decision making***

For the third objective, the study examined the relationship between data management practices and decision-making. The findings indicated a positive relationship, suggesting that improvements in data management practices including data collection, data processing, data interpretation, and data security would enhance

decision-making in schools within Nwoya District, and conversely, weak data management practices could hinder decision-making. Supporting this, Silva, Collier-Meek, et al. (2021) observed that although screening data is frequently collected in schools, academic progress monitoring is often neglected, and the use of data to guide instructional or intervention decisions is generally not part of routine practice. Conversely, Borghi and Van Gulick (2021) reported relatively strong data management practices among participants, although there was limited standardization within their research group. Nonetheless, participants expressed willingness to modify their practices in response to new technologies, opportunities, or requirements.

This study found that data interpretation practice was the strongest predictor and had a positive and significant relationship with decision-making in primary schools. The data interpretation practice is one of the most important parts of data management. Schildkamp et al. (2013) suggested that data management practices contribute to good decision-makings, for example about policy and practice. For instance, they argued that data informed the budget process, and improved planning for the schools. Furthermore, Öz and Arastaman (2022) found out that administrators used and interpret data to help in making decisions so that they meet the needs of management and other school stakeholders. This particular finding means that the more the participants practice the activity of data interpretation, the better decision-making in schools would be achieved Yibrie and Schildkamp (2015) argued that one of the important components of data management is data interpretation which if done correctly and the data used well will change the functioning of the school, practices and result into better student outcome. The awareness created that data interpretation positively relates to decision-making in primary schools is a good starting point for government, school administrators, school management committees and teachers to consider putting

interventions for training in data management so as to improve the quality of decision that they make.

In addition, the study found that data collection practices had a positive and significant relationship with decision-making in primary schools. The study also found that only a few public primary schools in Nwoya district were at a good level of practicing data collection. Data forms part of the data management practices that schools should take seriously. Yibrie and Schildkamp (2015) pointed out that when school administrators and teachers have good experience of data collection, there will likely be availability and use of data that could positively influence the decision that affects practices and student outcomes. Yibrie and Schildkamp (2015) found that in high-performing schools, teachers take an active role in collecting and analysing data, using student achievement records, classroom observation notes, and lesson plans. These practices help teachers identify areas where they need professional development and set priorities, goals, and targets when planning school interventions. Similarly, Swain, Hagaman, et al. (2022) reported that the use of utilizing effective data collection methods to track student progress on Individual Education Program (IEP) goals is essential to quality programming and meeting each student's specific needs, with teachers reported lack of time, resources, and training as barriers to data collection. In the present study, it was observed that data security practices were moderately implemented and showed a positive and significant relationship with decision-making in primary schools. Parsons et al. (2015) also suggested that strengthening an organization's security culture positively influences employee behaviour, which in turn enhances decisions related to compliance with security policies and other organizational activities. Data security encompasses the confidentiality, integrity, and availability of information, protecting systems, resources, and data from unauthorized access. Secure data can foster trust among users, encouraging

its use in decision-making (Peralta et al., 2024). The implication for schools is that improving data security practices is critical for building confidence in using data to inform decision-making.

Also, this study found that data processing practices were not significant and negatively related to decision-making in primary schools. This finding means that the reduction of data processing practices equally leads to a reduction in decision-making. Ndiku et al. (2014) similarly reported that school principals and teachers were not fully familiar with the student data required for effective planning. Their study concluded that ineffective student data management adversely affected school planning. In contrast, the Cafiero et al. (2022) highlighted data processing as a key factor supporting effective decision-making. Properly processed data ensures quality and accuracy, facilitates timely access for staff, allows for better data disaggregation, and promotes collaborative use of data aligned with clear objectives to support school decision-making (Kjeldsen, 2010). Challenges in data management may stem from the lack of data-based planning at the school level, inadequate human resource capacity, limited stakeholder support, and organizational culture (Nurzen, 2022). Furthermore, the observed negative relationship between data processing practices and decision-making could be influenced by the completeness of the data and the attitudes of those using it for school purposes. Therefore, improving data processing practices in primary schools through targeted training and enhanced infrastructure for data management is essential.

The study shows that data processing was poorly practiced in Nwoya district which is negatively regressing effective decision making in in the public schools within the district. This is likely due to the capacity gap and technology limitation (availability, access and usage) in schools, where majority of school teachers,

administrators, and management still have inadequate knowledge and basics on data processing practices. Poor data processing does not merely stall administration, but actively misguides strategic choices and resource allocation.

While alternative explanations might attribute poor decision-making to severe financial constraints in schools, infrastructural deficits, or rigid top-down political directives, this study argues that inadequate data management acts as the foundational bottleneck that exacerbates these external pressures

In a study conducted in Uganda, Cambodia and Georgia revealed lack of expertise of data users as major constraint to good practices on data in Uganda (Winters, et al. 2022). This is an implication for training and capacity building in Nwoya district. In Ugandan primary schools, strong data management practices directly enhance the quality, timeliness, and effectiveness of decision-making at both school and policy levels. The observed variations in the levels of data-based decision-making in public schools in Nwoya District highlight the need for urgent intervention. Strengthening data management systems, providing targeted training for staff, and digitizing data processes could substantially improve school governance and, in turn, learning outcomes.

5.4 Conclusions

In light of the study findings the discussions, the study concluded that.

1. The Four data management practices assessed, data collection was found to be the most practiced at the expense of processing, interpretation and security which were not well practiced in Nwoya public primary schools. The lessons learned from the public primary schools reveal that significant differences in data management practices are primarily driven by infrastructure disparities, varying digital literacy levels, and the shift from manual to digital systems. This limit tracking attendance and performance,

however, many public primary schools still rely on manual paper records, leading to inefficiencies and data loss.

2. This study further showed that a significant disparity exists among the components and levels of decision making in public primary schools in the district highlighting the need to scale up interventions for improving data management practices and relevant decision making in public primary school. The significant disparity among the components and levels of decision-making in public primary schools highlights a major barrier to educational equity and quality. Evidence shows that even within districts, school-level autonomy, teacher involvement, and parent engagement vary widely, resulting in disparate academic outcomes.

3. The study findings demonstrated the need for improvement in data management practices concerning the components of data collection, data processing, data interpretation and data security which would improve decision making in Nwoya public primary schools. The lessons learned indicate that improving data management practices specifically, using real-time assessment data strengthens instructional decisions, enables early intervention for at-risk students, and enhances student engagement in primary schools. Effective data-driven decision-making requires accurate, centralized data, teacher training in data literacy, and a cultural shift toward using, not just collecting, information

5.5 Recommendations for Policy and Practice

To address the problems highlighted in the discussion and conclusion, the following practical solutions are proposed.

1. Stakeholders directly concerned with promoting quality education should consider putting interventions for training their school stakeholders on data management

practices. Training school stakeholders in data management practices is a critical intervention for promoting quality education because it builds a culture of evidence-based decision-making. When stakeholders like teachers, administrators, and school management committees are equipped with data skills, they can more effectively track student progress, allocate resources, and improve school performance.

2. Stakeholders directly concerned with promoting quality education should consider putting interventions for training their school stakeholders at different levels of decision making. It is therefore, recommended that educational managers consider decentralising decision making moving it closure to the classroom and fostering shared, distributed leadership are necessary to increase transparency, improve stakeholders' morale, teachers' retention and create a sense of collective ownership, hence students' performances.
3. It is recommended that government, school administrators, school management committees, and teachers should consider putting interventions for training in data management to improve the quality of decisions that they make. The primary school's stakeholders should adopt a three-tier model focusing on people training /culture), Process (data-driven routines), and technology (systematic tools). Key recommendations include building a strong data-use culture, enhancing digital literacy, ensuring data security, and adopting collaborative, evidence-based decision-making for improved student outcomes.

5.6 Recommendation for Further Research

Based on the study limitations and the unanswered questions in the discussion, the following areas for further research are recommended.

1. Future research in this area could adopt qualitative or mixed-methods approaches to explore the effects of data management practices on decision-making in primary

schools.

2. Additionally, since the findings of this study are limited to public primary schools in Nwoya District, subsequent studies could expand the scope using comparative design to include public, community, and private primary and secondary schools to provide a more comprehensive understanding of data management and decision-making practices across different school types.

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Appendix A: Work Plan

S/No	Activity	Sept - Dec, 2020	Feb - May 2021	June – July 2023	Aug - Dec 2023	Jan - Dec 2025	Jan – April 2026	Jan- May 2026
1	Preparation of Proposal, submission and Defence							
2	Pilot Study							
3	Collection of Data							
4	Organization, Analysis and Interpretation of Data							
5	Writing Report							
6	Submission of Dissertation							
7	Examination							
8	Publication							

Appendix B: Research Budget

S/No.	Item	Quantity	Unit Cost	Amount
1	Stationery Ream of paper Envelopes A3	 5 Reams 2 package	 30,000/= 30,000/=	 150,000/= 60,000/=
2	Allowances for research assistants	3 for 10 days	3x10x50,000	1,500,000/=
	Refreshment	10 days	20,000/=	200,000/=
3	Transport (fuel) +70,000	100liters	100 x 5000/=	500,000/=
4	Hire of vehicles	2 vehicles	500,000/=	1,000,000/=
5	Secretarial services; Printing and photocopying Binding dissertation	3500 pages 6 copies	100 120,000/=	350,000/= 720,000/=
6	Data Collection and Analysis	1	1	600,000=
7	Contingency	1	1	500,000/=
8	Resource persons	2	400,000/=	800,000/=
9	Internet services	GBs	2 x 60,000/=	120,000/=
	TOTAL			6,500,000/=

Appendix C: Morgan Table

Sample Sizes(S) Required for the Given Population Sizes (N)

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	256	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	**1400**	**302**	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

Source: Adapted from R.V.Krejcie & D.W.Morgan (1970).

Respondent S/No…….

Appendix D: Questionnaire Data Collection

This Questionnaire is for Chairperson SMCs, Head Teachers, Deputy Head Teachers and Teachers. Dear Respondent,

My name is Oryema Phillip, a student pursuing Master of Education in Education Management from Gulu University. I am carrying out research on the topic data management practices and decision making in primary schools in Nwoya district. This research is purely for academic purposes and all the responses will be treated with utmost confidentiality. Please take time to answer these few questions by ticking the appropriate options as your views will play a very important role in the process of this study. Thank you so much for your cooperation in advance. **SECTION A: Bio-data**

Position by appointment in this School	**Teacher**	**Deputy Head Teacher**	**Head Teacher**	**SMC**	**Others specify**
Tick Only one which is most appropriate					

Gender	**Male**	**Female**	**Other, specify**
Tick Only one which is most appropriate			

Age group	18-22 years	23-27 years	28-32 years	33-37 years	38-42 years	42-47 years	48 Years and above
Tick Only one which is most appropriate							

The highest academic Qualification attained	PhD	Post Graduate degree	Post Graduate diploma	Degree	Diploma	Certificates	UACE	UCE
Tick Only one which is most appropriate								

Your duration of service at the current school (Years).	1 year below	2-5 years	6-9 years	0-13 years	14-17 years	18 years and above
Tick Only one which is most						

SECTION B: Data Management Practices

Instructions: Please read the following statements and tick the one which best describes your opinion.

Number	1	2	3	4	5
Scale	Strongly Disagree (SD)	Disagree (D)	Not Sure (NS)	Agree (A)	Strongly Agree (SA)

Please indicate the extent to which you agree with the following statements on data Collection practices in this school *(Tick Only **one** which is most*	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
This school always collects data to enable the generation of information on and for the operation of the school.					
In this school, data identification is always done before data collection is done.					
In this school, data are always collected based on their relevance to the school stakeholders.					
Data collected is always consistent and reliable; therefore, the school depends on it for decision-making.					
This school always collects data on time to allow for timely data processing.					

Most data collected in this school always meets its exact intended purpose.					
This school has trained personnel who manage all the data that is collected.					
This school always ensures there is accuracy and completeness of data when collecting data.					
This school has specific data collection tools that are always used for collecting data.					

Please indicate the extent to which you agree with the following statements on Data	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
In this school, data cleaning is always done on the data collected to detect inaccurate data.					
This school always does data coding for all qualitative data collected.					
In this school, data is always transformed from one data format to another format.					
This school always caters to missing data in the data set of the school.					
This school always does its data processing using computer software.					
Proper data entry is always done for all data collected in this school.					
This school always analyses its data using descriptive statistics like, frequency tables, graphs, charts, etc.					
In this school, processed data is always shared with the stakeholders to be utilized in making decisions in the					

Please indicate the extent to which you agree with the following statements on Data Interpretation Practices *(Tick only **one** which is most appropriate to you).*	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
In this school, data is always interpreted and explained to stakeholders before it is put to use.					
This school's stakeholders always compare and contrast its different data sets to predict trends in performance.					
During data interpretation, outlier data (data that are unique from the rest) are always identified.					
In this school, existing data are reinterpreted and used to make future trend predictions.					
In this school, data interpretation limitations are always addressed to ensure the data meets its intended					
This school stakeholder always tests the significance/importance of the data collected.					
In this school, stakeholders always present data in graphs, charts, and tables to ensure easy visualization and interpretation.					
In this school, stakeholders always use information from data interpretation to					

Please indicate the extent to which you agree with the following statements on Data Security Practices *(Tick Only **one** which is most appropriate to you).*	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
In this school, there is a secure data storage instruments are used for					
This school's data are always backed up using files, computers, and or computerized devices like; external					
There is a system in place that always limits both physical and digital access to					
There are arrangements in place that accurately identifies data users before they have access to school data.					
There are rules and regulations governing using the data of this					
There is a practice in place to eliminate sensitive school data that is no longer necessary for ongoing					
Data are converted into different forms and stored in the different formats Like, text converted into Audio and or video recordings and vice- versa					
In this school, data is always memorized by the stakeholders and are					

SECTION C: Decision Making in Schools

Please indicate the extent to which you agree with the following statements on Strategic level of decision making in this school *(Tick Only **one** which is most appropriate*	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
The School Management Committee (SMC) of this school makes all strategic decisions					

In this School, SMC makes resource allocation decisions with input of information from school data.					
In this School, SMC build consensus with inputs from other levels of decision-making, but they make the final decisions.					
The SMC of this school always vote to choose an item/action to become a decision of management to implement.					
The SMC of this school delegate their decision to be taken by the administrators of this school.					
The SMC of this school always communicate timely the decisions they have made to the administrators for implementation.					
The SMC of this school always evaluate decisions they have made and provides recommendations to the administration for implementation.					

Please indicate the extent to which you agree with the following statements on Tactical level of decision making in this school *(Tick Only **one** which is most appropriate to you).*	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
The administrators of this school make all decisions required for medium-term operation of this school.					
The administrators of this school make medium-term decisions from strategic direction from the School Management Committee (SMC).					
The administrators build consensus with inputs from departments, but the administrators make the final decisions.					
The administrators vote to choose the course of action to form tactical decisions					

The administrators of this school are able to use data quickly and effectively to make decisions					
The administrators of this school fully delegate the decision to departments, the department discuss, discern, and decide on behalf of the school.					
The administrators of this school timely communicate decisions made to the teachers for implementation.					
The administrators of this school always monitor and evaluate decisions made and make necessary recommendations to the stakeholders					

Please indicate the extent to which you agree with the following statements on Operational level of decision making in this school *(Tick Only **one** which is most appropriate to you).*	**Strongly Disagree**	**Disagree**	**Not Sure**	**Agree**	**Strongly Agree**
Teachers of this school make decisions on day-to-day activities of the school.					
This school has a simple repetitive routine arrangement that guide the day-to-day operational decision making.					
Teachers of this school are able to use data quickly and effectively to make operational decisions.					
Teachers of this school always base their decisions making on how the previous decisions were made to make current decisions.					
Teachers of this school always make cost-effective operational decisions because they use the available data to base their decisions.					

Teachers of this school timely and effectively implement decisions made at different levels.					
Teachers of this school communicate (report) timely and effectively on decisions they have made and or implemented to the stakeholders.					
The teachers of this school always monitor and evaluate decisions made and make necessary recommendations to the stakeholders.					

Appendix E: Consent Form

Dear Respondent,

My name is **Oryema Phillip** a student pursuing Master of Education in Education Management from Gulu University. I am carrying out research on the topic Data Management Practices and Decision Making in Primary Schools in Nwoya District. This research is purely for academic purposes and all the responses will be treated with utmost confidentiality. I am kindly requesting for your consent to take part in this research. Your participation is completely voluntary and the information you give will be treated with utmost confidentiality and will be used for the study only. Thank you very much for accepting to take part in this study.

Please consent to this study by ticking the appropriate response in the table.

Title.....Sex .....Age.....

Statement	
I have read and understood the research background information.	
I have been allowed to ask questions about the research	
I agree to take part in the research to fill the questionnaire	
I understand that taking part in the research is voluntary that I can withdraw when necessary	
I acknowledge that my words maybe quoted in publications, reports and other research.	

Signature of participant: …..... Date: ….....

Name of researcher: ……..Signature: …… Date: …….

Appendix F: Research Clearance Letter

GULU UNIVERSITY

OFFICE OF THE DEAN
FACULTY OF EDUCATION AND HUMANITIES

P.O. BOX 166, GULU UGANDA
TEL:+256 0471-432922

22nd February 2020

TO WHOM IT MAY CONCERN

This is to introduce to you Mr. Oryema Phillip Reg No 17/U/2361/MED, a student pursuing a programme of study leading to the award of masters in Education Management and Administration of Gulu University.

He is undertaking research on the topic:

"Data Management Practices and Decision Making in Public Primary Schools in Nwoya District" which is in partial fulfilment of the requirements for the award.

Any assistance given to him in relation to his research work will be highly appreciated.

Yours sincerely

GULU UNIVERSITY
12 FEB 2021
FACULTY OF EDUCATION AND HUMANITIES

Dr. Bebwa Isingoma
Dean Faculty Education and Humanities

Appendix G: Plagiarism Check

GULU UNIVERSITY

P.O. Box 166
Gulu, Uganda

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Fax: +256 471343095
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Declaration for Originality Form

This form must be completed and signed for all scholarly work produced.

Name: ___ ORYEMA PHILLIP (MR.)_____

Personal File No.(staff) Reg. (student).___ REG. NO. 17/U/2361/MED__

Faculty/Institute:___ FACULTY OF EDUCATION AND HUMANITIES, GULU UNIVERSITY

Department:____ EDUCATION MANAGEMENT AND ADMINISTRATION ___

Title and bibliographic description of the work

DATA MANAGEMENT PRACTICES AND DECISION MAKING IN PUBLIC PRIMARY SCHOOLS IN NWOYA DISTRICT

Declaration.

1. I understand what plagiarism is and I am aware of the University policy on this regard,
2. I declare that this … **Dissertation** … (Proposal, thesis, essay, assignment, paper, report etc.) is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other people's work or my work has been used, this has been properly acknowledged and referenced in accordance with Gulu University requirements,
3. I have not sought or used the services of any professional agency to produce this work,
4. I have not allowed, and shall not allow anyone to copy my work with the intention of passing it off as his/her own,
5. I understand that any false claim of this work shall result in disciplinary action in accordance with University Policy on Plagiarism.

Signature _____ Date 28th/08/2025

Originality Report

The article/thesis/document titled above have been subjected to plagiarism check and the level was found to be……**17%** (percent) this is classified as:

- ✓ Minor
- ☐ Moderate
- ☐ Serious

Yours sincerely,

Manana N Herbert
Ag. University Librarian

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ORYEMA Phillip
Reg: 17/U/2361/MED
C/o: Nwoya District Local Government,
P.O Box 1033 Gulu -Uganda.

Date: 17th June 2026.

To: The Research Supervisor,
Dr. Jerry Bagaya of Gulu University,
P.O. BOX 166, Gulu, Uganda.
Dear Sir/Madam

T. Mr. Onyema,
Please proceed to get clearance from the Dean to print hard copies for binding & submission.
18/06/26

RE: Compliance Reports On Viva Recommendations on Dissertation Titled 'Data Management Practices and Decision Making in Public Primary Schools in Nwoya

S/N	Supervisors' Comment	Remarks	Page
1.	Insert Gulu University Logo On top of the cover page	Gulu University Logo inserted On top of the cover page	Cover pages
2.	Insert Supervisor's name on the cover page	Supervisor's name Inserted on the cover page	Cover pages
3.	Format all the pages; on the left to 1.5, on the right, up and bottom to 1.0	All the pages formatted accordingly	All pages
4.	The declaration page should come before approval page.	Corrected	Declaration & Approval pages.
5.	Edit the grammar on declaration page	Corrected	Declaration page
6.	Insert Acknowledgment and dedications	Insert Acknowledgment and dedications.	
7.	Remove the paragraphing on the abstract.	All the paragraphs on the abstract page removed and it is 242 words in total.	Abstract Page
8.	Edit this reference (Fujimoto, Ogawa, Komukai & Nakayama, (2020).	Corrected	Page 3
9.	Edit this reference (Michelsen & Wells, (2017).	Corrected	Page 7
10.	Edit this reference Schumacher and VandeCreek (2015)	Corrected	Page 12
11.	Edit this reference (educational and administrative)	Corrected	Page 15
12.	Edit this reference (Wang & Cheng, (2020).	Corrected	Page 19
13.	Edit this reference (Barriball & While, 1999).	Corrected	Page 20
14.	Edit this reference (Chen & Liu, (2020).	Corrected	Page 26

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15.	Edit the grammar to the hypothesis on page 8	Edited as guided	3.12.1 Page 26
16.	Edit this reference (Plonsky & Ghanbar, 2018).	Edited as guided	Page 27
17.	Capitalized words tables "Table 5 to Table 9 and Table 10 to Table 13.."	Edited as guided	Page 31
18.	Fit all tables on one page	All tables fitted on its page	All pages with tables
19.	Correct the formula of χ^2 - test	Correct formula inserted	Page 39
20.	The prefix, *Fig.* should be in italic	Edited as guided	Page 44
21.	Correct the title of 5.2.1 Data Management Practices	Corrected	Page 50
22.	Correct the title of 5.2.2 Level of Decision Making	Corrected	Page 50
23.	Correct the title of 5.2.3 Relationship between data management practices and decision making	Corrected	Page 50
24.	Correct the title of 5.3.1 Data Management Practices	Corrected	Page 51
25.	Correct the title of 5.3.2 Level of Decision Making	Corrected	Page 52
26.	Correct the title of 5.3.3 Relationship between data management practices and decision making	Corrected	Page 53
27.	Peralta, A. (2024) is cited in text on page 55	maintained	Page 55
28.	Introduce & Correct the Numbering Under 5.4	Corrected	Page 56
29.	Introduce & Correct the Numbering Under 5.5	Corrected	Page 57
30.	Introduce & Correct the Numbering Under 5.6	Corrected	Page 58
31.	Correct the reference 'McBurnie, C. (2021).	Corrected	Page 62
32.	Correct the reference 'Ministry of ICT and National Guidance. (2024).'	Corrected	Page 63
33.	References that were not cited in text were deleted	Were deleted	Page 65
34.	Uganda Bureau of Statistics. (2024).	Corrected	Page 67

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