

UNIVERSITE DE YAOUNDE I

CENTRE DE RECHERCHE ET DE
FORMATION DOCTORALE EN
SCIENCES (CRFD) HUMAINES, SOCIALE
ET EDUCATIVES

UNITE DE RECHERCHE ET DE
FORMATION DOCTORALE EN
SCIENCES EDUCATIVES ET INGENIERIE
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UNIVERSITY OF YAOUNDE I

POST GRADUATE SCHOOL FOR
HUMAN, SOCIAL AND
EDUCATIONAL SCIENCES

UNIT OF RESEARCH AND
TRAINING IN SCIENCE OF
EDUCATION AND EDUCATIONAL
ENGINEERING

CURRICULUM AND EVALUATION

**THE ROLE OF EDUCATION MANAGEMENT
INFORMATION SYSTEM (EMIS) IN
ENHANCING NON-FORMAL EDUCATION
PROGRAMS IN MFOUNDI DIVISION**

Dissertation presented and defended on the 26 September 2025



Option: Educational Management

Speciality: Management of information systems and educational planning

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by the University of Yaoundé I, a dissertation entitled: “The role of Education Management Information System (EMIS) in Enhancing Non-Formal Education programs in Mfoundi Division.”, in partial fulfilment of the requirements for the award of a Master of Education Degree in Educational Management from the University of Yaoundé I

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To
Mr Mboa Didier Julien and Mrs Betehe Françoise Claude

ACKNOWLEDGEMENTS

I also sincerely thank all those who, in one way or another, supported and helped me during the realization of this work. I especially think of: My thesis supervisor, Dr. SHAIBOU Abdoulai Haji, Lecturer, for trusting me by accepting to supervise this work, for the relevance of the proposed topic, and for his constant support and availability during the writing of this thesis. I have learned a lot by your side.

Pr MAINGARI Daouda, head of Department of curriculum and evaluation, for his willingness to help us overcome our academic challenges and Pr MGBWA Vandelin, Dr. MBIAKOP Martial Thierry, Dr. SII Marie Pascale, Dr. NGUELE Owono Marie, Dr. KENNETH Yuomeyse, for my academic and social training.

My family for their moral, financial, and material support all through my academic journey. I particularly thank : my elder sister Mboa Lydie Annick, and brothers Mboa Owono Michel Ange, Mboa Azegue Romaric, Mboa William Cabrel, Mboa II Ddier Wilfried and my nieces Mgbwa Mboa Cecilia Esmeraldas, Ngoun marie-Dominique, Betehe Grace Divine. And My classmates and friends for their great team spirit. I especially think of Younous Issa, Zoa Ekani Gabriel Manuel, Etta Lewis Bawak, Ngansop Ndeng Cedric, Suwantang Viyof, Tano Sophia, Kelly Etaka.

ABSTRACT

This study investigates the role of the Education Management Information System (EMIS) in enhancing the effectiveness of non-formal education programs in Mfoundi Division, Centre Region of Cameroon. Using a convergent parallel mixed-methods design, the research integrated quantitative data from structured questionnaires with qualitative insights from semi-structured interviews. The study sampled 50 respondents across government, NGO, and private non-formal education centers, complemented by 10 key informant interviews. Findings revealed that while general awareness of EMIS was moderately high, actual utilization remained limited, especially for data-driven decision-making, learner assessment, and resource planning. Major barriers identified included insufficient infrastructure, limited training, weak institutional support, and a fragmented policy framework. However, centers with stronger leadership engagement and donor-funded support demonstrated relatively higher levels of adoption. The study highlights the need for strategic investments in digital infrastructure, tailored capacity-building programs, and inclusive policies to ensure equitable EMIS access across all types of non-formal centers. By triangulating diverse stakeholder perspectives, the research offers actionable recommendations to improve EMIS implementation and support national education reforms aligned with SDG 4. The findings contribute to the broader discourse on education technology and evidence-based planning in sub-Saharan Africa's non-formal education landscape.

Keywords: EMIS, Non-formal Education, Cameroon, Data Use, Educational Technology, SDG 4

RESUME

Cette étude examine le rôle du Système d'information pour la gestion de l'éducation (SIGE) dans l'amélioration de l'efficacité de l'éducation non formelle dans le département du Mfoundi, région du Centre du Cameroun. En utilisant une conception mixte parallèle convergente, la recherche a intégré des données quantitatives issues de questionnaires structurés à des données qualitatives provenant d'entretiens semi-structurés. L'étude a interrogé 50 participants issus de centres d'éducation non formelle publics, communautaires/ONG et privés, complétés par 10 entretiens avec des informateurs clés. Les résultats ont révélé que, bien que la sensibilisation générale au SIGE soit modérément élevée, son utilisation effective reste limitée, notamment pour la prise de décision basée sur les données, l'évaluation des apprenants et la planification des ressources. Les principaux obstacles identifiés incluent l'insuffisance des infrastructures, le manque de formation, le soutien institutionnel faible et un cadre politique fragmenté. Toutefois, les centres bénéficiant d'un leadership engagé et d'un soutien des bailleurs de fonds ont démontré des niveaux d'adoption plus élevés. L'étude recommande des investissements stratégiques dans les infrastructures numériques, des formations adaptées et des politiques inclusives pour garantir un accès équitable au SIGE dans tous les types de centres. Ces résultats contribuent aux réformes éducatives nationales en appui à l'ODD 4 et au débat plus large sur les technologies éducatives en Afrique subsaharienne.

Mots-clés : SIGE, Éducation non formelle, Cameroun, Utilisation des données, Technologie éducative, ODD 4

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ABBREVIATIONS AND ACRONYMS

EMIS: Educational Management Information Systems

UNESCO: United Nations Educational, Scientific and Cultural Organisation

UNICEF: United Nations International Children's Emergency Fund

MDG: Millennium Development Goal

SDG: Sustainable Development Goal

AI: Artificial Intelligence

ICT: Information and Communication Technology

ESSP: Education Sector Strategic Plan

UIS: Institute for statistics

NFE: Non-Formal Education

NPS: National Policy on Education

NGO: Non-Governmental Organisation

NDS30: National Development strategy 2020-2030

SABER: System Approach for Better Education Results

M&E: Monitoring and Evaluation

GIS: Geographic Information System

MINEDUB: Ministry of Basic Education

MINJEC: Ministry of youth Affairs and Civic Education

MIS: Management Information System

GPE: Global Partnership for Education

NSDES: National Strategy for the Development of Education Statistics

SIS: Student Information System

HRIS: Human Resource Information System

SA-SAM: South African School Administration and Management Systems

CHAPTER ONE: INTRODUCTION

Education Management Information Systems (EMIS) are increasingly recognized as vital tools in achieving inclusive and equitable education globally. By systematically collecting, processing, and analyzing educational data, EMIS enables stakeholders to make evidence-based decisions that enhance the efficiency and effectiveness of education programs (UNESCO, 2020). In the realm of non-formal education, which addresses the needs of marginalized and underserved populations, EMIS offers transformative potential by addressing critical challenges such as limited access, inadequate quality, and inefficient resource management (Infed.org, 2023). These systems are instrumental in ensuring that non-formal education programs are not only accessible but also responsive to the diverse needs of learners.

In the Mfoundi Division, the delivery of non-formal education programs faces persistent challenges, including resource constraints and a lack of data-driven planning mechanisms. The integration of EMIS in this context presents an opportunity to overcome these barriers by providing a robust framework for informed decision-making, improved monitoring and evaluation, and targeted interventions. By leveraging the capabilities of EMIS, educational stakeholders can enhance the accessibility, quality, and sustainability of non-formal education initiatives, thereby fostering greater equity in educational opportunities. This research aims to investigate the pivotal role of EMIS in strengthening non-formal education programs within the Mfoundi Division. Grounded in recent literature and case studies, the study examines global best practices alongside local applications to provide a nuanced understanding of EMIS implementation. Ultimately, the research seeks to contribute to the discourse on education management and policy development, particularly within the context of Cameroon. Through this exploration, it highlights the potential of EMIS to address systemic gaps and advance the broader objective of education for all.

Background to the Study

In the realm of modern education management, data has become an indispensable resource for informed decision-making and effective governance. Education Management Information Systems (EMIS) serve as powerful tools that integrate technology, processes, and human expertise to collect, process, and disseminate education-related data. These systems are particularly valuable in addressing the challenges of under-resourced education systems, such as those found in many developing nations, including Cameroon. By leveraging accurate and

timely data, EMIS enables policymakers and administrators to identify gaps, track progress, and allocate resources efficiently.

Non-formal education, on the other hand, is a critical pillar of lifelong learning. It provides alternative pathways for individuals who may not have access to formal schooling due to socio-economic constraints, cultural barriers, or geographic isolation. Non-formal education programs, such as literacy classes, vocational training, and community-based learning initiatives, are designed to empower individuals with the skills and knowledge necessary to improve their quality of life. In Cameroon, particularly in Mfoundi Division of the Centre Region, non-formal education plays a vital role in addressing the needs of marginalized populations, including youth who have dropped out of school, adults seeking literacy skills, and women pursuing economic empowerment.

However, non-formal education programs in Mfoundi Division face significant challenges due to the absence of robust systems for planning, monitoring, and evaluation. Without reliable data, it becomes difficult to assess program effectiveness, identify areas of need, or track learner outcomes. EMIS presents a transformative solution to these challenges by providing a structured framework for managing education data. Through its integration into non-formal education programs, EMIS enhances the ability of administrators to make evidence-based decisions, improve accountability, and maximize the impact of these initiatives.

Historical Background

The history of Educational Management Information Systems (EMIS) reveals an evolution shaped by technological advancements, the recognition of the importance of data in education, and the increasing demand for effective planning and decision-making. Over time, EMIS has grown from basic record-keeping systems to advanced tools that play a critical role in both formal and non-formal education programs, particularly in contexts like Mfoundi Division. In the early 20th century, education systems primarily relied on manual record-keeping to track basic metrics such as student attendance, teacher performance, and school infrastructure.

These records, while rudimentary, laid the foundation for systematic data collection and analysis. Non-formal education, which often operated outside the formal structures, received little attention during this period. The focus on formal education limited the recognition and integration of non-formal programs into broader educational planning. The introduction of computers in the 1960s and 1970s brought the first wave of technological innovation to

education data management. Governments in developed countries began to automate administrative tasks such as payroll and student registration.

Although these early systems were basic, they demonstrated the potential for technology to improve efficiency. However, non-formal education programs continued to face challenges due to their decentralized nature and the lack of systematic data collection. This period highlighted the need for more inclusive and comprehensive approaches to educational data management. By the 1980s, the global push for EMIS began to take shape. International organizations such as UNESCO, the World Bank, and UNICEF emphasized the importance of data-driven education planning to address issues like illiteracy and inequity.

This era also marked the growing recognition of the value of non-formal education in addressing educational disparities. Governments and organizations started to explore ways to integrate non-formal education data into broader systems, although challenges such as limited infrastructure and expertise persisted, particularly in developing regions. In the late 20th century, international organizations began promoting EMIS as a tool to support national educational planning. The adoption of EMIS was part of a broader push to achieve the Millennium Development Goals (MDGs), particularly universal primary education.

The transition from the MDGs to the Sustainable Development Goals (SDGs) in 2015 shifted global priorities towards inclusivity, equity, and quality in education. SDG 4, which emphasizes lifelong learning opportunities, brought non-formal education into sharper focus. EMIS evolved to monitor not just formal education but also adult literacy, skills development, and community education programs. From 2020 onwards, technological innovations such as cloud computing, artificial intelligence, and big data analytics further expanded the capacities of EMIS.

These advancements enabled real-time data collection, analysis, and forecasting, supporting policymakers in addressing pressing issues like school dropouts, gender disparities, and teacher shortages. In Cameroon, the adoption of EMIS can be traced back to the early 2000s when the government began reforming its education sector to align with global trends and standards. Early EMIS initiatives focused on data collection for formal education, including primary and secondary schools. With support from international donors like UNESCO and the World Bank, Cameroon established basic infrastructure for EMIS.

The system gained further traction as the government sought to improve accountability and transparency in the education sector. However, the initial focus was limited to formal education,

leaving gaps in the management of non-formal education programs. Recognizing the critical role of non-formal education in addressing illiteracy, unemployment, and social inequality, the scope of EMIS began to expand by 2020. The turn of the 21st century marked the digital revolution, which brought new possibilities for EMIS.

Web-based platforms, cloud computing, and real-time data collection became standard features, enabling education systems to monitor a wide range of indicators, including those specific to non-formal education programs. EMIS began to play a crucial role in achieving global education goals. In areas like Mfoundi Division, these tools have the potential to bridge gaps in data collection and enhance non-formal education programs by providing actionable insights. In recent years, EMIS has embraced cutting-edge technologies such as big data, artificial intelligence (AI), and machine learning.

These tools have transformed how data is used for predictive analysis, resource allocation, and policy development. Modern EMIS systems are increasingly inclusive, ensuring that non-formal education programs are adequately represented and supported. For regions like Mfoundi Division, these advancements mean better tracking of literacy programs, vocational training, and other non-formal initiatives that are critical for local development. The COVID-19 pandemic further underscored the importance of EMIS in adapting to challenges and ensuring continuity in education.

Since 2020, technological advancements have significantly enhanced the functionality of EMIS in Cameroon. Mobile applications and cloud-based platforms have revolutionized data collection, making it faster and more reliable. These tools have been particularly beneficial in reaching remote and underserved areas, ensuring that data is representative of the entire population. In Mfoundi Division, ICT tools have enabled real-time monitoring and evaluation of non-formal education programs, improving program delivery and accountability.

Technological integration has also allowed for better data visualization and reporting. Dashboards and analytics tools provide stakeholders with clear and actionable insights, enabling them to track progress, identify gaps, and implement targeted interventions. This level of sophistication has elevated EMIS from a simple data collection tool to a comprehensive management system. The Cameroonian government has shown strong commitment to the development of EMIS as part of its broader education reform agenda.

Key policies, such as the Education Sector Strategic Plan (ESSP), highlight the importance of data-driven decision-making in achieving national education goals. Collaboration with international organizations has played a critical role in providing technical expertise, funding, and capacity-building initiatives. Standardized guidelines for data collection and reporting have been introduced to ensure consistency and reliability across the education system. Training programs have been developed to equip educators, administrators, and policymakers with the skills needed to utilize EMIS effectively. Despite its successes, the implementation of EMIS in Cameroon faces several challenges. Limited funding for infrastructure and capacity-building remains a significant obstacle. Many rural and remote areas still lack the necessary ICT tools and internet connectivity to fully benefit from EMIS. Additionally, issues related to data security, system interoperability, and resistance to technological change hinder progress. However, the opportunities for growth are immense. The recognition of EMIS as a cornerstone of educational development provides a strong foundation for future investments.

Continued advancements in technology, coupled with sustained policy commitment, hold the potential to transform EMIS into a truly inclusive and equitable system. Non-formal education programs, in particular, stand to benefit greatly from the expanded use of EMIS, ensuring that marginalized populations are not left behind in Cameroon's quest for educational progress. Finally, the historical development of EMIS from its global origins to its application in Cameroon underscores its critical role in achieving educational equity and inclusivity. By expanding its scope to include non-formal education, EMIS has demonstrated its versatility and effectiveness as a management tool. In Mfoundi Division, it has become a valuable asset in enhancing non-formal education programs, paving the way for social and economic empowerment. As Cameroon continues to address existing challenges, the role of EMIS will undoubtedly remain central to its educational development and progress toward achieving the Sustainable Development Goals.

Conceptual Background

Education Management Information Systems (EMIS) play a pivotal role in the planning, management, and implementation of education systems, particularly in regions facing challenges such as limited resources and educational inequities. According to UNESCO (2020), EMIS refers to an integrated platform designed for the systematic collection, processing, analysis, and dissemination of educational data. This definition highlights the transformative potential of EMIS in ensuring that education systems are data-driven, accountable, and aligned

with global objectives like Sustainable Development Goal 4 (SDG 4), which aims to ensure inclusive and equitable quality education for all. EMIS can improve non-formal education by enhancing data collection and analysis, which helps in strategic decision-making and policy formulation. This can lead to better resource allocation and more effective planning for non-formal education programs, ensuring they are more inclusive and responsive to community needs. Additionally, integrating EMIS with other data systems can help bridge gaps between formal and non-formal education, promoting a more holistic approach to education management.

Tegegn Nuresu Wako (2003) expands on this by describing EMIS as a systemic approach to educational information management, where data is used not only for record-keeping but also as a strategic tool for decision-making and equitable allocation of resources. Similarly, the UNESCO Institute for Statistics (UIS) (2021) identifies EMIS as a critical mechanism for enhancing transparency and efficiency in tracking educational performance indicators at local, regional, and national levels. The present research adopts UNESCO's (2020) definition due to its relevance in capturing the operational, strategic, and impact-driven dimensions of EMIS, which are central to addressing the educational needs of Mfoundi Division.

Non-formal education operates outside the boundaries of formal education systems and is characterized by its flexibility and inclusivity. As defined by Getmyuni (2024), non-formal education encompasses “structured educational activities conducted outside the formal school system, aimed at addressing specific learning needs and promoting lifelong learning.” This form of education is particularly significant in addressing the diverse learning requirements of individuals who are excluded from formal schooling due to economic, social, or geographical constraints. By offering tailored learning opportunities such as adult literacy programs, vocational training, and community-based education, non-formal education plays a crucial role in promoting equity and lifelong learning in underserved regions.

Non-formal education (NFE) serves as an essential complement to formal education systems, especially in communities where traditional schooling is inaccessible or insufficient. Brander et al. (2006) define NFE as structured and organized educational activities conducted outside the formal school framework. This form of education is flexible, participatory, and tailored to the specific needs of learners, focusing on skill acquisition, literacy improvement, and lifelong learning. Melissa Conroy (2021) underscores the role of NFE in providing alternative pathways for individuals who have been excluded from the formal education system, emphasizing its

capacity to promote social inclusion and economic empowerment. Furthermore, the Council of Europe (2020) describes NFE as a learner-centered and community-driven process that encourages active participation and self-reflection among learners. In the context of Mfoundi Division, NFE offers a practical solution to the challenges posed by limited access to formal education, enabling learners to acquire skills, improve literacy, and contribute to the socio-economic development of their communities. This research adopts the definition provided by Brander et al. (2006), as it effectively captures the inclusive and adaptable nature of NFE, which aligns with the specific needs and circumstances of Mfoundi Division.

The integration of EMIS into non-formal education programs marks a significant shift towards data-driven approaches in addressing educational disparities. EMIS enables the systematic collection and analysis of data related to learner demographics, program participation, and resource allocation, thereby ensuring that programs are tailored to meet specific community needs. As highlighted by UNESCO UIS (2023), EMIS “facilitates the collection and analysis of data, enabling stakeholders to monitor program outcomes, allocate resources effectively, and implement evidence-based interventions.” For regions like Mfoundi Division, where educational inequities persist, EMIS can provide the framework necessary to ensure that non-formal education initiatives are inclusive, efficient, and responsive to the needs of learners.

The conceptual foundation of EMIS in non-formal education can be understood through several theoretical lenses. Systems theory views education as an interconnected system of components such as learners, educators, resources, and policies that work together to achieve common goals. EMIS functions as the central element within this system, integrating diverse data inputs into a cohesive platform that informs program management and evaluation. Additionally, the data-informed decision-making theory emphasizes the role of accurate and timely data in shaping educational policies and practices. By providing reliable data analytics, EMIS empowers educators and policymakers to design interventions that are both effective and contextually appropriate. Finally, the Sustainable Development Goals (SDG) framework, particularly SDG 4, highlights the importance of inclusive and equitable education for all. EMIS aligns with this goal by supporting the development of non-formal education programs that address the unique challenges faced by marginalized populations.

Contextual background

In the context of Mfoundi Division, EMIS offers tangible benefits in enhancing non-formal education programs. Adult literacy programs, for instance, can use EMIS to track learner

progress, monitor attendance, and evaluate program outcomes. Similarly, vocational training centers can leverage EMIS to align their curricula with labor market demands, ensuring that learners acquire relevant skills. Community-based education initiatives can benefit from the real-time data provided by EMIS, enabling educators to identify underserved communities and design targeted interventions. The key benefits of EMIS in these applications include enhanced program efficiency, improved resource allocation, increased accountability, and greater inclusivity. By addressing these critical aspects, EMIS contributes to the sustainability and impact of non-formal education initiatives in Mfoundi Division.

Education Management Information Systems (EMIS) are transformative tools that play an integral role in advancing non-formal education programs, especially in the context of Cameroon's Mfoundi Division. Non-formal education, by design, caters to underserved and marginalized groups such as out-of-school children, adults needing literacy programs, and communities without access to traditional education systems. In recent years, non-formal education has become a focal point for achieving Sustainable Development Goal 4 (SDG4), which underscores inclusivity, equitable access, and lifelong learning.

Cameroon's commitment to SDG4 is evident through its education policies, such as Law 98/004 of 1998. This law laid the foundation for an education system that emphasizes inclusivity, bilingualism (English and French), and universal primary education. These principles have been further strengthened by the 2024 updates to Cameroon's education laws, which aim to synchronize national education goals with global objectives, particularly SDG4. These updates prioritize the use of EMIS to monitor key SDG4 indicators, which include literacy rates, gender parity, and the provision of technical and vocational education. The integration of EMIS ensures that policymakers can track and evaluate the progress made in non-formal education programs while addressing gaps effectively.

EMIS contributes to the achievement of educational equity in several significant ways. First, it collects critical data on enrollment, attendance, and learner outcomes, providing a comprehensive picture of educational access and quality. This information is essential for identifying disparities between rural and urban areas, gender inequalities, and gaps in educational infrastructure. Second, EMIS supports resource allocation by guiding policymakers on where funds and programs should be focused to maximize impact. For instance, by analyzing data from EMIS, authorities in the Mfoundi Division can identify neighborhoods or communities that need additional non-formal education centers or adult literacy

programs. Moreover, EMIS enhances accountability and transparency by enabling the monitoring of progress toward SDG4 indicators. The 169 SDG indicators, spread across 17 goals, serve as a framework for evaluating global and national progress. In the context of education, these indicators provide benchmarks for literacy levels, inclusive education, and the elimination of gender disparities. By aligning with these indicators, EMIS ensures that Cameroon's efforts in education are measurable, trackable, and geared toward achieving tangible results.

The National Policy on Education (NPS) further emphasizes the importance of integrating technological solutions like EMIS to ensure educational quality and equity. The system allows stakeholders to monitor the performance of non-formal education programs and to adapt them to emerging needs. For instance, during the COVID-19 pandemic, the ability to collect and analyze real-time data through EMIS helped governments and organizations globally to adapt educational programs to new challenges lessons that Cameroon can leverage to enhance its educational resilience. EMIS fosters collaboration among stakeholders by providing a centralized platform for data sharing and coordination. Non-formal education programs often involve partnerships between the government, NGOs, and private entities. By offering transparent, reliable data, EMIS facilitates these collaborations, ensuring that all stakeholders are working toward common goals.

The relationship between EMIS and non-formal education is anchored in the capacity of EMIS to provide comprehensive data collection, analysis, and reporting. Non-formal education programs often operate in diverse, decentralized settings, making it challenging to monitor learner enrollment, attendance, and progress. EMIS offers a unified platform to gather data from these programs, enabling policymakers to evaluate their effectiveness and ensure they align with the goals of SDG4, such as promoting lifelong learning and inclusivity. For example, EMIS can track literacy rates among adults participating in non-formal education programs, identify gender disparities, and highlight regions with limited access to educational services.

Cameroon's legal framework, including the 1998 Law on the Orientation of Education (Law 98/004), supports inclusive education and recognizes the importance of lifelong learning. This framework aligns with SDG4 by emphasizing educational access for all, including those in non-formal settings. The 2024 updates to Cameroon's education laws further prioritize the integration of EMIS to monitor and enhance education delivery across both formal and non-formal sectors. By leveraging EMIS, the government can ensure that non-formal education

programs are not sidelined but are given equal attention in terms of resource allocation, program development, and progress tracking. Furthermore, the National Policy on Education (NPS) underscores the importance of integrating technology to improve educational outcomes. For non-formal education, this means using EMIS to provide data-driven insights that guide the design of targeted interventions. For instance, if EMIS data reveals that a specific area within the Mfoundi Division has a high number of illiterate adults, targeted literacy programs can be launched to address this gap. Similarly, EMIS can highlight the success rates of vocational training programs, ensuring that they are aligned with local employment needs and contributing to the socioeconomic development of the region.

EMIS also plays a crucial role in supporting the monitoring of SDG4 indicators specific to non-formal education. These include the participation rates of youth and adults in education and training programs and the achievement of literacy and numeracy skills. By aligning with the 169 SDG indicators and the 17 goals, EMIS ensures that non-formal education programs are not only impactful at the local level but also contribute meaningfully to global education targets. EMIS acts as a bridge between policy and practice, providing the data and insights needed to make non-formal education programs in the Mfoundi Division more effective, inclusive, and sustainable. This integration ensures that non-formal education remains a critical component of the broader education system and plays its part in achieving both national and global education objectives.

Theoretical background

In the context of this study, which investigates the role of Education Management Information Systems (EMIS) in enhancing non-formal education programs in the Mfoundi Division, two theoretical frameworks have been identified as particularly relevant: Systems Theory and the Information Systems Success Model (ISSM). These frameworks not only provide conceptual clarity but also offer methodological tools for analyzing how EMIS functions within decentralized and resource-constrained educational settings.

Systems Theory

Systems Theory, developed by Austrian biologist Ludwig von Bertalanffy in the 1940s and formalized in his 1968 work *General System Theory*, emerged as a response to the fragmented way in which disciplines were studying isolated components of complex structures. Von Bertalanffy proposed that all systems biological, social, mechanical, or organizational consist

of interdependent components working together to achieve a common goal. The theory has since been widely adopted across disciplines including biology, engineering, sociology, and education. In the educational context, Systems Theory provides a lens for understanding schools, ministries, and even learning programs as organized systems composed of subsystems such as administration, teaching, infrastructure, policy, and technology. These subsystems interact through processes involving inputs (resources, policies, learners), throughputs (teaching, data processing), outputs (results, performance indicators), and feedback loops (evaluation, reporting, reforms). A malfunction in any subsystem such as weak data collection or poorly trained staff can affect the overall performance of the system.

Over time, Systems Theory has been applied in various education studies to analyze school effectiveness, resource allocation, policy implementation, and more recently, the integration of technology. For instance, Chapman and Mahlck (2004) used systems approaches to analyze education management reforms in developing countries, highlighting the need for coordinated planning and accurate information flows. In this study, Systems Theory is relevant because it allows us to examine EMIS not as a standalone tool but as part of a broader educational system in non-formal education settings. It helps to highlight the interconnectedness of actors (teachers, program managers, learners), processes (data entry, reporting), and structures (policy frameworks, funding), thereby shedding light on how EMIS functions or fails to function as an integral part of the system.

Information Systems Success Model (ISSM)

The Information Systems Success Model (ISSM), initially proposed by William H. DeLone and Ephraim R. McLean in 1992 and updated in 2003, emerged from the field of management information systems. The model was designed to provide a comprehensive framework for evaluating the effectiveness and impact of information systems in organizational contexts. It has since become one of the most widely used models in information systems research and evaluation. ISSM is grounded in the need to go beyond simple technical measures and assess both technical and human dimensions of system performance. The original model included six dimensions: System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact. In the updated version, DeLone and McLean replaced the last two dimensions with a more holistic measure of Net Benefits, and added Service Quality as a separate dimension recognizing the importance of technical support and training.

Since its development, ISSM has been applied in diverse sectors including healthcare, business, government, and education to evaluate information systems such as learning management systems (LMS), enterprise resource planning (ERP) platforms, and EMIS. Studies such as those by Heeks (2002) and Bwalya et al. (2014) have used the ISSM model to explore the challenges of digital systems in Sub-Saharan Africa, emphasizing issues like usability, data quality, and lack of capacity building as key barriers to success. In the case of EMIS in non-formal education programs, especially within the Mfoundi Division, ISSM is instrumental in assessing why the system is effective in some contexts and less so in others. By examining system quality, data quality, user experiences, and the ultimate benefits to decision-making and learner tracking, the model enables a holistic evaluation of both strengths and weaknesses in EMIS deployment. This perspective is crucial given the diversity of non-formal education centers in Mfoundi, which often operate with minimal resources and varying levels of digital literacy among staff.

Integration into the Present Study

Taken together, Systems Theory and ISSM complement one another: Systems Theory provides a macro-level view of EMIS as a component of an educational ecosystem, while ISSM offers a micro-level assessment of the system's usability, user satisfaction, and outcome relevance. Their integration into the theoretical background of this study provides a solid conceptual foundation for analyzing the role of EMIS in planning, coordination, data use, and decision-making within non-formal education settings. By drawing on these well-established theories, the study is positioned to generate findings that are not only empirically grounded but also theoretically meaningful, helping to bridge the gap between system design and actual implementation outcomes in real-world educational environments.

Problems statement

Education Management Information Systems (EMIS) are globally recognized as essential tools for effective educational planning, monitoring, and administration. They provide accurate, timely, and comprehensive data that support decision-making, resource allocation, and policy development across education systems. In an ideal context, EMIS should play a transformative role in enhancing non-formal education programs, particularly in regions like Mfoundi Division, where such programs serve marginalized populations including school dropouts, adult learners, and other underserved groups. A well-functioning EMIS in this setting would facilitate the systematic collection and use of data to track learner enrollment, monitor attendance, evaluate learning outcomes, and inform strategic planning.

However, the reality in Mfoundi Division reflects a significant gap between this ideal and the current situation. Non-formal education programs in the region often operate without a structured or integrated EMIS, relying instead on manual and fragmented data collection practices that are prone to errors, inconsistencies, and incompleteness. As a result, reliable data on learner progress, program performance, and resource allocation are often unavailable, making it difficult to assess impact or improve program effectiveness. This situation is further exacerbated by a shortage of trained personnel capable of managing data systems, as well as the exclusion of non-formal education from national EMIS frameworks. Consequently, non-formal education programs in Mfoundi remain disconnected from national planning processes, underfunded, and marginalized in both policy and practice.

This lack of a functional EMIS not only impedes effective decision-making at local and national levels but also limits progress toward achieving Sustainable Development Goal 4 (SDG 4), which calls for inclusive and equitable quality education for all. Without accurate data, education authorities are unable to identify areas of greatest need, allocate resources efficiently, or implement data-driven reforms. Therefore, addressing the absence of an operational and context-appropriate EMIS in Mfoundi's non-formal education sector is crucial for improving educational equity, strengthening accountability, and enhancing the overall effectiveness of these vital programs.

Research Objectives

Main Objective

The main objective of this study is to evaluate the role of Education Management Information Systems (EMIS) in enhancing the effectiveness and management of non-formal education programs in Mfoundi Division.

Specific Objectives

1. To examine how EMIS supports the planning and coordination of non-formal education programs in Mfoundi Division.
2. To assess the extent to which EMIS facilitates data collection, analysis, and reporting for decision-making in non-formal education management.
3. To evaluate the role of EMIS in monitoring learner enrollment, attendance, and achievement in non-formal education centers.

Research Questions

Main Research Question

What is the role of Education Management Information Systems (EMIS) in enhancing the effectiveness and management of non-formal education programs in Mfoundi Division?

Specific Research Questions

1. How does EMIS support the planning and coordination of non-formal education programs in Mfoundi Division?
2. To what extent does EMIS facilitate data collection, analysis, and reporting for decision-making in the management of non-formal education?
3. What role does EMIS play in monitoring learner enrollment, attendance, and achievement in non-formal education centers in Mfoundi Division?

Significance of the Study

This study is of critical importance to a wide range of stakeholders concerned with improving the governance, quality, and outcomes of non-formal education (NFE) in Cameroon, particularly in the Mfoundi Division. In the face of growing demand for inclusive and lifelong learning opportunities, non-formal education plays a key role in reaching out-of-school youth, adult learners, internally displaced persons, and other marginalized populations. However, the management of NFE programs remains a significant challenge due to fragmented data systems, weak planning structures, and limited monitoring mechanisms. The integration and effective use of Education Management Information Systems (EMIS) can serve as a transformative solution to these challenges.

- **To the policy makers**

For policy makers at the Ministry of Basic Education, this study will provide evidence-based insights into how EMIS contributes to the planning, coordination, and evaluation of NFE programs. It will highlight the policy gaps and operational limitations that hinder the effective use of EMIS in non-formal settings, thereby guiding the formulation of strategic frameworks and resource allocation in line with national priorities such as the *National Development Strategy 2020–2030 (NDS30)* and the *Law No. 98/004 of April 1998 on the orientation of education in Cameroon*.

- **Education administrators**

For education administrators at the regional and divisional levels, particularly those tasked with managing literacy centers, vocational programs, and community education initiatives, the study offers practical recommendations on how to leverage EMIS for improved data collection, reporting, and performance monitoring. Strengthening administrative effectiveness through EMIS will lead to better resource planning, improved learner tracking, and enhanced transparency and accountability.

- **Non-formal education practitioners and facilitators**

Non-formal education practitioners and facilitators will also benefit, as the study identifies how EMIS can support them in monitoring learner progress, ensuring accurate enrollment data, and adapting teaching strategies based on real-time feedback. Additionally, development partners, NGOs, and civil society organizations involved in education will gain insights into how to align their interventions with national EMIS frameworks for greater impact and sustainability.

- **Researchers and scholars**

Researchers and scholars in the field of educational planning and technology will find this study valuable for expanding the knowledge base on EMIS applications in non-formal education, particularly within the African context. The study is also aligned with *Sustainable Development Goal 4*, which advocates for inclusive, equitable, and quality education and lifelong learning for all, ensuring no one is left behind in the educational development process.

Delimitation of the study

Geographical delimitation

The study will focus on the Mfoundi Division, specifically targeting non-formal education programs. These programs are often managed by a variety of stakeholders, including local education authorities, community organizations, and non-governmental bodies. The research aims to explore how EMIS is utilized within this setting to enhance program efficiency, particularly in planning, execution, monitoring, and evaluation. By investigating the local application of EMIS, the study intends to uncover region-specific insights that may guide improvements.

Thematic Delimitation

the research falls within the realm of education management information systems, with an emphasis on their role in non-formal education. It aims to assess the effectiveness of EMIS in supporting the delivery of quality education in this context, using international standards and benchmarks such as the Systems Approach for Better Education Results (SABER) - EMIS framework. The study seeks to identify challenges, gaps, and opportunities to optimize EMIS for non-formal education in the Mfoundi Division. This research is vital as it seeks to bridge gaps in the application of EMIS to non-formal education, an area often underrepresented in broader educational reforms. By identifying challenges and opportunities, the study aims to provide actionable recommendations to enhance the effectiveness of EMIS in achieving educational goals within Mfoundi Division.

Organisation of work

The study will follow a five-chapter structure. Chapter One introduces the study by presenting a general background to the research. It includes the historical, conceptual, contextual, and theoretical foundations of the topic, while clearly defining the research problem, objectives, and questions. It also outlines the significance, scope, and operational definitions used in the study. Chapter Two reviews the existing literature and theoretical foundations relevant to the study. This chapter provides conceptual clarifications, examines the components and global trends of EMIS, explores its applications in planning, monitoring, and decision-making, and highlights challenges and progress in its implementation, particularly within the Cameroonian context. It concludes by identifying key research gaps that justify the present study. Chapter Three presents the research methodology, including the research design, study area, target population, sampling strategy, data collection instruments, and analysis techniques. This chapter also addresses issues of validity, reliability, and ethical considerations, with an emphasis on both qualitative and quantitative approaches. Chapter Four presents the findings obtained from the fieldwork, including the demographic profile of respondents, interpretation of results, and an integrated analysis of the data. Chapter Five offers a discussion of the key findings, drawing connections with the literature reviewed and research objectives. It concludes the study by providing relevant recommendations for policy, practice, and system development, as well as suggestions for further research to improve EMIS support in non-formal education programs within the Mfoundi Division.

Operational definition of terms

Education

Education comes from the Latin word “educare”, the action of educating, training, instructing someone. Education is an essential process in human development. According to Adesemowo and Sotonade (2022), education is the act or process of educating or applying discipline on the mind or a process of character training. Education is expected to affect or condition the social behavior of the person being educated.

Education Management Information System

An EMIS can be defined as the ensemble of operational systems and processes increasingly supported by digital technology – that enables the collection, aggregation, analysis and use of data and information in education, including for management and administration, planning, policy formulation and monitoring and evaluation (M&E). This definition insists on the systemic nature of EMIS, a fact which is often overlooked in efforts to reinforce government information systems (UNESCO, 2018).

Information

Information refers to data that have been converted into a meaningful and useful context for specific end users. Thus, information is generated through the transformation of data (Al-Mamary and Aziati, 2014)

Non - Formal Education

Non-formal education refers to structured learning activities outside the formal school system. It is designed to meet the needs of specific groups, focusing on practical skills, literacy, and community development. It is flexible in terms of age, duration, and delivery methods, catering to learners who may not have access to traditional education systems (UNESCO, 2020).

CHAPTER TWO: LITERATURE REVIEW

The integration of digital technologies into education management has become increasingly vital in achieving educational effectiveness and transparency. Education Management Information Systems (EMIS) serve as strategic tools for data-driven planning, decision-making, and performance monitoring in education systems (UNESCO, 2022). In Cameroon, the growing demand for efficiency in educational governance particularly in urban centers such as Mfoundi Division necessitates the deployment of robust EMIS platforms to manage expanding school populations, resource constraints, and administrative complexity (MINESEC, 2023).

This chapter reviews the conceptual, theoretical, and empirical literature surrounding EMIS and its relevance to administrative effectiveness in secondary schools. It offers insights into global trends, regional practices, and Cameroonian realities. The literature review is structured around key themes including EMIS functionalities, theoretical foundations, administrative processes, and implementation challenges. This lays the groundwork for understanding how EMIS can improve educational management in line with the Sustainable Development Goals (SDG 4), the National Development Strategy 2020–2030 (Republic of Cameroon, 2020), and the Education Sector Strategy Plan 2023–2030 (MINESEC, 2023).

Conceptual Clarifications

Education Management Information System (EMIS)

An Education Management Information System (EMIS) is a digital system designed to collect, manage, process, and report education-related data to inform strategic planning and decision-making (UNESCO Institute for Statistics [UIS], 2023). It typically integrates data across domains such as student enrollment, staffing, infrastructure, finance, and assessment to create a unified database accessible to different administrative levels.

Recent studies emphasize that EMIS is a foundational tool for improving education quality, enabling governments and institutions to use accurate, timely, and disaggregated data (World Bank, 2023). In Cameroon, EMIS is increasingly seen as a vital asset in strengthening accountability and decentralization processes within secondary education (Ngwana, 2022).

Technological advancements have further expanded EMIS functionalities. Modern EMIS platforms support mobile data collection, real-time dashboards, artificial intelligence (AI) for

predictive analysis, and geographic information systems (GIS) for school mapping (Peters et al., 2021). Such innovations are particularly important in urban education management where administrators require fast, evidence-based insights to address systemic gaps.

Administrative Effectiveness

Administrative effectiveness refers to the extent to which educational institutions successfully execute planning, organizing, coordination, leadership, and control functions to fulfil their objectives (Bush & Glover, 2016). In secondary education, effective administration encompasses human resource planning, curriculum supervision, budget management, discipline enforcement, and stakeholder engagement.

Effective administration is data dependent. Without accurate information on student performance, staff deployment, infrastructure status, or financial resources, school leaders cannot formulate responsive strategies (Leithwood, Harris, & Hopkins, 2020). As such, EMIS provides a foundation for enhancing operational efficiency, reducing duplication, and optimizing the use of resources.

In Cameroon, secondary schools face administrative challenges such as teacher shortages, infrastructure deficits, and delays in funding, which affect service delivery (Tchombe & Nkwetisama, 2021). By integrating EMIS, school administrators can better plan resource allocation, track academic performance, and report progress to higher authorities, thereby fostering accountability and results-oriented governance.

Non-Formal Education

Although this study mainly focuses on formal secondary schools, it is also very important to understand the place of non-formal education (NFE) in the education system and in the use of EMIS. Non-formal education refers to all types of learning that take place outside the regular school system. It is specially designed to support out-of-school youth, adults, dropouts, and community members who still need education or specific skills. According to UNESCO (2023), non-formal education is essential because it promotes basic literacy, vocational training, life skills, and community development.

In the Education Management Information System (EMIS), non-formal education is sometimes forgotten or not fully included. Yet, EMIS can help non-formal education providers by tracking important data such as the number of learners, gender balance, program completion rates, and

learner progress. This kind of data helps decision-makers know how well non-formal programs are performing and where more support is needed. EMIS can also help the government plan and improve the non-formal education sector by providing accurate information on the learning needs of different groups in the society.

In Cameroon, non-formal education is managed by both the Ministry of Basic Education (MINEDUB) and the Ministry of Youth Affairs and Civic Education (MINJEC). These two ministries oversee community literacy programs, youth training centers, and civic education for people who are outside the formal school system. Even though Cameroon recognizes the importance of non-formal education, the country still faces challenges in including non-formal education data in EMIS. A study by the African Union (2021) showed that in many African countries, including Cameroon, EMIS often does not capture enough data on non-formal education. This creates a big gap in national education statistics and limits proper planning and support for non-formal learners.

The lack of proper data on non-formal education makes it difficult for the government to track the progress of inclusive education policies. It also affects how resources are distributed to non-formal programs. Without strong data, non-formal education is often left out when decisions are made about funding, infrastructure, or teacher recruitment. This situation slows down efforts to achieve Sustainable Development Goal 4 (SDG 4), which focuses on providing quality education and lifelong learning opportunities for all.

One of the main problems in Cameroon is that many non-formal education centres do not have the tools, training, or capacity to collect and report data correctly. Most of these centres are located in rural areas and operate under very difficult conditions. They often use paper-based systems and do not have access to digital reporting platforms. This makes it hard to gather reliable and timely information from the non-formal sector. Even when some data is collected, it is usually stored in isolated files and is not connected to the central EMIS database used by the ministries.

To solve these problems, Cameroon needs to make sure that non-formal education is fully included in EMIS. This can be done by improving the data collection process in non-formal centres, training staff on how to use EMIS tools, and making the system easier to access, especially in rural areas. The country can also adopt mobile-based data reporting solutions to help centres with limited infrastructure. More cooperation between MINEDUB, MINJEC, and

other partners is also necessary to create a strong, unified system that properly tracks all education sectors.

Integrating non-formal education into EMIS would bring many benefits. It would help the government and stakeholders understand the real number of learners in the country, both inside and outside the formal school system. It would also help policymakers design better education programs that meet the needs of every learner, including the most vulnerable groups like school dropouts, young mothers, internally displaced persons, and rural youth. This integration would also improve the country's ability to plan, finance, and monitor non-formal education in the same way as formal education.

Even though this study focuses on formal secondary education, non-formal education cannot be ignored. It is a key part of Cameroon's education system and plays an important role in building a literate, skilled, and inclusive society. By expanding EMIS to fully cover non-formal education, Cameroon will move closer to achieving its national education goals and its international commitments to provide education for all throughout life.

Theoretical Framework

To guide the analysis of EMIS and its influence on administrative effectiveness, this study adopts two complementary theoretical frameworks: Systems Theory and Management Information Systems (MIS) Theory.

Systems Theory

Systems Theory, as articulated by von Bertalanffy (1968), views an organization as an interconnected system in which different components interact dynamically. In educational institutions, this theory implies that different functional areas such as enrolment, staffing, curriculum, finance, and infrastructure must work in synergy to achieve systemic efficiency.

EMIS acts as a unifying element that connects these sub-systems by collecting and processing data across domains. As suggested by Caldwell and Spinks (2013), data integration and feedback mechanisms are critical for continuous improvement in schools. In Cameroonian secondary schools, EMIS can bridge communication gaps between school management, regional delegations, and central education authorities.

Systems Theory also emphasizes feedback loops. For instance, if data from EMIS shows a declining trend in student attendance, administrators can adjust teaching schedules or introduce interventions to improve engagement. Without such timely feedback, system responses become reactive rather than strategic (Mansaray, 2022).

Management Information Systems (MIS) Theory

MIS Theory, developed in the field of business and information systems, examines how digital tools are used to enhance organizational effectiveness. MIS are designed to support managerial decision-making by providing relevant, timely, and accurate information (Laudon & Laudon, 2022). In the education sector, EMIS represents an adaptation of MIS principles for school administration.

MIS Theory highlights the importance of user-interface design, data quality, institutional capacity, and technological infrastructure in the success of information systems (O'Brien & Marakas, 2019). Applying this framework to EMIS in Cameroonian schools allows the study to assess not only the availability of data but also how school leaders interpret and utilize that data for management purposes.

Moreover, MIS Theory underscores the role of training and change management. Administrators may resist adopting EMIS tools if they perceive them as burdensome or misaligned with their existing workflows (Meddling et al., 2020). This theory, therefore, informs the investigation of factors affecting EMIS adoption and institutional readiness in the Mfoundi Division.

Evolution and Global Trends in EMIS

Globally, EMIS has evolved from basic data-entry systems into advanced platforms supporting strategic planning and real-time performance monitoring. Early EMIS, typically spreadsheet-based and centralized, were limited in scope and plagued by delays in data processing (Carrizo, Sauvageot, & Bella, 2003). Over time, innovations in cloud computing, AI, and mobile data collection have transformed EMIS into more responsive and decentralized systems.

A recent report by the Global Partnership for Education (GPE, 2022) notes that next-generation EMIS now offer dashboards with key performance indicators, GIS-based school mapping, and modules for tracking teacher absenteeism, gender disparities, and resource gaps. Countries like

Rwanda and Ghana have adopted such systems to inform education financing and teacher deployment.

In Africa, EMIS is increasingly linked to results-based financing and national education accounts (Sabates et al., 2022). In Kenya, for example, EMIS supports curriculum reform tracking and school-level budgeting, while Ethiopia's EMIS is used to monitor dropout rates and equity indicators.

In Cameroon, EMIS development has been guided by the National Strategy for the Development of Education Statistics (NSDES) and the Education Sector Strategy Plan (2023–2030), which advocate for digitization, harmonization, and decentralization of data systems (MINESEC, 2023). Despite these policy frameworks, challenges such as inadequate infrastructure, limited internet access, and insufficient data validation persist (Fonkem & Neba, 2023).

To address these gaps, partnerships with international agencies such as UNESCO, UNICEF, and the World Bank have supported the deployment of Open EMIS in pilot zones. However, uptake remains inconsistent, and most secondary schools in urban areas like Yaoundé still rely on semi-automated systems or paper-based records, limiting the full potential of EMIS (Ngum & Taku, 2023).

Components and Functionalities of EMIS

Education Management Information Systems (EMIS) are composed of multiple interrelated modules that collect and manage various types of data needed to support educational planning and administration. These modules often include Student Information Systems (SIS), Human Resources Information Systems (HRIS), finance and budget modules, school infrastructure records, and learning outcomes data dashboards (UIS, 2023; UNESCO, 2022).

Student Information System (SIS)

The Student Information System (SIS) is a critical component of EMIS that manages detailed records on student enrolment, demographics, performance, promotion, transfers, attendance, and disciplinary actions. This data enables school administrators to track individual learner progress, identify trends in dropout and repetition, and plan targeted interventions (Sabates et al., 2022).

In Cameroonian secondary schools, most SIS are either partially digitized or manually managed. According to Ngwana (2022), while urban institutions such as those in Yaoundé and Douala have made progress in adopting basic SIS platforms, many schools still lack the capacity for real-time student data management. Where systems exist, the data often remains underutilized due to lack of training and integration with national EMIS platforms (MINESEC, 2023). Effective use of SIS can support early warning systems for at-risk students and enable data-informed counselling, particularly when integrated with assessment and attendance records (UNICEF, 2022). For example, a sudden drop in attendance coupled with low test scores could trigger a counsellor-led intervention, if such signals are detected through EMIS.

Human Resource Information System (HRIS)

HRIS within EMIS is responsible for managing data related to education personnel, including teacher profiles, qualifications, deployment, promotions, in-service training, and attendance. These systems help central and school-level administrators make informed decisions on staffing needs, training priorities, and compliance with professional standards (UNESCO, 2023). Cameroon's secondary education sector faces chronic challenges related to teacher distribution, absenteeism, and professional development. A robust HRIS could enhance transparency in teacher deployment and ensure that qualified personnel are equitably distributed across schools (Tchombe & Nkwetisama, 2021). However, research by Fonkem and Neba (2023) shows that many regional delegations still rely on fragmented spreadsheets or hardcopy files, which limits efficiency.

The integration of biometric attendance tracking into HRIS has proven successful in countries like Ghana and Uganda, where it has significantly reduced teacher absenteeism and strengthened accountability (World Bank, 2022). A similar system could be piloted in urban Cameroonian schools, given their relatively higher digital infrastructure.

Finance and Fee Management Systems

The Finance and Fee Management System is a very important part of the Education Management Information System (EMIS). This system helps schools and the government to carefully track all money activities. It keeps records of school budgets, how money is spent, school fees collected from students, and the government money sent to schools (subsidies). When schools use this finance system correctly, it brings financial transparency. This means that the way money is collected and spent in schools becomes clear to everyone. It also helps

to reduce fraud, fight against corruption, and make sure that schools are funded fairly. According to the Global Partnership for Education (GPE, 2022), finance systems inside EMIS make it easy for the government to share money based on real-time information from the schools. This helps to make sure that the schools that need help the most can receive the necessary support.

These systems are very important, especially in places where schools manage their own money and must report how they are using it. When schools have control over their budgets, there must be accountability. This means that school principals, bursars, and managers must give correct reports that explain how they are spending the money. When EMIS is used for finance management, reporting becomes faster, easier, and more accurate.

In many Cameroonian schools, the management of school fees is still done manually using paper files. According to MINESEC (2023), most bursars or school principals are still the ones handling this process by hand, which can easily cause mistakes, delays, and sometimes fraud. It is also common for money records to get missing, or for errors to appear when calculating school budgets or expenses. This manual way of working makes the system weak and unreliable.

If schools in Cameroon start using a digital finance and fee management system connected to EMIS, the situation can improve. A digitized system will help school leaders to properly track all the money coming in and going out of the school. It will also help them to quickly see how much money is remaining, where the money was spent, and whether the school is respecting its budget. When financial information is well organized in the system, it is also easier for schools to plan for future needs. For example, school leaders can use the system to forecast next term's budget based on past expenses. This helps to avoid last-minute financial problems.

The finance module in EMIS can also help schools to send their financial reports to the Ministry of Secondary Education on time. Currently, many schools delay in sending reports because the process is slow and tiring when done on paper. Sometimes, information is lost or incomplete. But when schools use a digital finance system inside EMIS, they can submit their reports quickly, safely, and correctly to the central authorities. This helps the Ministry to have a clear and updated picture of school finances at all times.

One of the biggest benefits of using a finance system in EMIS is that it helps to reduce fraud and mismanagement of school funds. Because all financial records are kept inside the system,

it becomes easy to track every transaction. This makes it difficult for school money to be misused without being noticed. When there is a mistake or a suspicious transaction, the system can raise an alert so that the problem can be checked and corrected immediately. This helps to make the management of school finances more honest and transparent.

In summary, Finance and Fee Management Systems in EMIS are very useful to help schools in Cameroon manage their money in a clear and correct way. It helps to reduce mistakes, fight corruption, and improve the planning and reporting of school budgets. To fully benefit from this system, Cameroonian schools need to move from manual records to digital finance systems that are well integrated with EMIS. This will make financial management in schools faster, safer, and more reliable, and will help to build a better education system for all.

Infrastructure and Asset Management

When people talk about the Education Management Information System (EMIS), they usually think only about student numbers, exam results, and teacher information. But there is another part that is very important, which many people do not talk about enough. This is infrastructure and asset management. This part of EMIS helps schools to keep correct records of their buildings and school materials like the number of classrooms, toilets, libraries, laboratories, chairs, tables, computers, and other equipment. When schools have this information well arranged, it helps the government and school managers to plan well and to know which schools need help.

In Cameroon, especially in towns like Yaoundé, many schools are facing big infrastructure problems. Ngum and Taku (2023) explained that many schools in Yaoundé are too full, the classrooms and toilets are not in good condition, and school equipment is too old or not enough. One of the reasons why these problems continue is because many schools are not keeping good records. They are still using paper files, which can easily get missing or damaged. Because of that, it is hard for the government to know which schools need new buildings or repairs.

If schools in Cameroon start using EMIS to manage their school buildings and materials, things can really improve. EMIS can help the schools to know when a classroom, toilet, or equipment needs repair before it completely gets bad. It can also help the government to send money, chairs, or other materials to the schools that really need them, instead of sharing things equally without checking who needs help most. This can help reduce the big difference we see between schools in towns and schools in villages.

EMIS can also help us to plan. For example, if a school is having more students every year, EMIS can show that soon the school will not have enough classrooms. This will help the government and the school to plan quickly before the problem becomes too big. EMIS can also help to know when equipment like computers, chairs, or laboratory tools are getting old so that they can be repaired or replaced on time. Another important thing is that EMIS keeps all this information in one place, so it is easy to check and follow how money and materials are being used. This can help to fight against corruption and make sure that resources are used properly.

Let's take a simple example. A secondary school in Yaoundé may have too many students but very few classrooms. EMIS can show this problem quickly so that the government can either build more classrooms or send some students to other nearby schools with enough space. If the same school has old laboratory equipment that has not been checked for many years, EMIS can send a message that it is time to do maintenance or buy new ones. This will help the students to always have good materials to use for their studies.

In short, infrastructure and asset management in EMIS is very important because it can really help to make our schools better. It helps the government and schools to plan well, to share resources fairly, and to keep the school buildings and materials in good condition. For this to work well in Cameroon, schools must update their information in EMIS all the time. This will help us to solve many of the problems we see today and make sure that all students, whether in town or in the village, can study in safe and good environments.

Role of EMIS in Educational Planning and Administration

The Education Management Information System (EMIS) is very important for planning and managing the education system. Without good information, it is very hard for schools and the government to plan well. EMIS provides the right data that helps school leaders and education authorities to set realistic goals, share resources fairly, and check the progress of different school activities. According to UNESCO (2022), EMIS is a key tool that supports planning in all areas of education.

In secondary schools, EMIS helps with short-term planning like how to arrange classrooms, how to send teachers to schools that need them, and how to manage the school timetable. It also supports medium-term planning such as making annual schoolwork plans and preparing school budgets for each academic year. For the long-term, EMIS helps in planning big projects like

building new classrooms, creating new schools, or expanding school facilities to meet future needs.

In Cameroon, the Education Sector Strategy Plan (ESSP 2023–2030) shows that EMIS is a very important system that can make educational planning more effective, especially at the local level. The government wants schools and local education offices to manage their own activities (decentralized planning). According to the Republic of Cameroon (2020), EMIS helps regional education delegations to make decisions based on correct information from their own areas. This means that each region can solve its own school problems using data that really shows what is happening on the ground.

EMIS also helps in forecasting and scenario planning. For example, if many children are now completing primary school, EMIS can help predict that there will soon be more students entering secondary schools. With this information, the government can start planning early by building more classrooms, training more teachers, and preparing more learning materials before the problem becomes serious. In cities like Yaoundé, where the number of people is growing very fast and schools are becoming overcrowded, EMIS is very useful to help the government plan for the future.

Another important role of EMIS is to promote fairness and equality in education. According to UNICEF (2023), EMIS can collect and arrange school data in different groups, for example by gender (boys and girls), location (urban or rural), disability status, and family income levels. When the data is separated in this way, it helps school managers and the government to see if some groups of children are being left behind. This can help the Ministry of Education to create special programs like scholarships for poor children, extra support for girls, or special materials for children with disabilities. EMIS can also help in planning where to send teachers, making sure that schools in rural areas are not forgotten. In addition, EMIS helps school leaders and education planners to quickly check the impact of their decisions. If a region receives more teachers or builds more classrooms, the system can show if this is really improving school attendance and student performance. This helps education managers to see what is working and what needs to be improved.

In summary, EMIS plays a big role in helping schools and the education system in Cameroon to plan well, manage resources fairly, and solve problems early. It supports planning at the school, regional, and national levels. EMIS also makes sure that all children whether rich or

poor, boys or girls, children in the city or in the village have a fair chance to succeed. For EMIS to fully help the Cameroonian education system, schools and education offices must always collect good data, update it regularly, and use it to make smart decisions.

EMIS and Decision-Making Processes in Education

One of the biggest advantages of the Education Management Information System (EMIS) is that it helps school leaders and education authorities to make better decisions based on real data. This is what we call data-driven decision-making. EMIS provides correct, timely, and useful information that can guide all education managers, from the school level to the national level, to plan well and solve problems quickly.

At the school level, principals, bursars, and heads of departments can use EMIS reports to track student attendance, check which teachers are doing well or having challenges, and monitor how school resources like books, classrooms, and materials are being used. According to Olanrewaju & Yusuf (2022), when school leaders use EMIS to follow these key areas, they can quickly see where problems are coming from and act immediately. For example, if student attendance is dropping in some classes, the principal can investigate early to understand the reason and solve it before the situation gets worse.

At the central and regional levels, policymakers and education officers can use the combined (aggregated) EMIS data from many schools to see the big picture of the whole education system. This helps them to know which regions have overcrowded schools, where there are not enough teachers, and where school performance is low. With this information, the Ministry of Education can plan new reforms, send more teachers, build more schools, or create special programs to solve the problems. Without EMIS, it would be very difficult to get this type of clear information quickly.

However, for EMIS to help decision-making, the data must be reliable, updated, and usable. This is still a big problem in Cameroon. According to the World Bank (2022), many Cameroonian schools still face challenges with poor data entry, delays in updating school records, and different ways of reporting information from one region to another. Sometimes, schools do not have trained staff to handle EMIS properly, and this reduces the quality of the data. When school data is not correct or arrives too late, it becomes difficult for education managers to make good decisions based on it.

When EMIS is used properly, it can help school leaders make real-time decisions that improve school operations. For example, if a principal uses EMIS to notice that some teachers have too much workload while others have less, the principal can quickly adjust the timetable and share the work fairly. EMIS can also show which classes are becoming too crowded, so the school can request extra teachers or more classrooms from the education delegation. These small, day-to-day decisions may seem minor, but when they are added together, they can greatly improve the overall performance of the school and make the school more effective in delivering quality education. According to Tchombe & Nkwetisama (2021), these small but timely decisions can help schools solve problems quickly, making the whole system stronger.

In addition, EMIS allows the Ministry of Education to react quickly to urgent issues. For example, if the system shows that school dropouts are increasing in a particular region, the Ministry can immediately investigate and send support to that area. Without EMIS, such problems may only be noticed after many months or even years, by which time the situation may have already caused great harm to students. Another important point is that EMIS encourages accountability. When school heads know that their data is being checked regularly at the central level, they will be more careful to manage school resources correctly and follow up on student performance. It creates a system where everyone is expected to do their part well, from the smallest primary school to the largest government office.

All in all, EMIS plays a key role in helping education managers at all levels to make smart, fast, and well-informed decisions. It helps schools to solve problems early, allows the government to see system-wide issues, and promotes fairness and accountability. For Cameroon to fully benefit from EMIS in decision-making, the government must train school staff to collect and manage good quality data and ensure that the system is well used in all schools across the country. When this is done, EMIS will greatly contribute to improving the quality and management of education in Cameroon.

EMIS and Monitoring & Evaluation (M&E)

Monitoring and Evaluation (M&E) is very important in schools because it helps school managers and the government to see if the education system is working well. Monitoring means regularly checking how activities are going in schools, while evaluation means studying whether the plans and objectives are being achieved. Through M&E, education leaders can know if students are learning well, if teachers are doing their work correctly, and if school resources are being used properly.

The Education Management Information System (EMIS) makes Monitoring and Evaluation easier and faster. EMIS helps schools and education offices to follow many things at the same time. For example, it can track the materials that schools receive, such as textbooks, computers, and furniture (these are called inputs). It can also track what schools are doing every day, like teaching and organizing activities (these are processes). EMIS shows results like the number of students passing exams and the number of teachers trained (these are outputs). Finally, it helps to measure the final success, like how much students have learned or how many students finish their studies (these are outcomes). According to UNESCO (2022), when schools and education authorities use EMIS, they can easily follow all these important areas.

EMIS also helps in formative and summative evaluation. Formative evaluation happens while activities are still going on. It gives quick feedback so that schools and education managers can make improvements immediately. For example, if teachers start using a new teaching method, EMIS can show quickly if students are improving or not. Schools can then make changes early if needed. On the other hand, summative evaluation is done at the end of a project or program. It checks whether the planned objectives were achieved. According to UIS (2023), EMIS can help the government to study whether programs like teacher training really help to improve student performance.

In many Cameroonian secondary schools, Monitoring and Evaluation is still weak. According to Ngwana (2022), many schools keep poor records, and school inspectors do not visit regularly. Schools usually write their reports on paper, which is slow and can easily get lost. Often, schools wait until the end of the term or year to send reports, and sometimes the information is missing or arrives too late. Because of this, problems in schools are not solved quickly. When EMIS is used well, it can change M&E from a slow, paper-based system to a fast, digital one. With EMIS, education managers can follow what is happening in schools in real time, even without visiting the schools every day. EMIS dashboards can show which schools are doing well and which schools are struggling. The system can also provide performance scorecards to compare schools in different regions. EMIS can even send automatic alerts when problems start, such as when students stop attending school regularly, when school results are dropping, or when resources have not reached the schools.

When education authorities receive this information early, they can act quickly. For example, they can send more teachers, extra learning materials, or school inspectors to support the schools that are facing challenges. This helps to solve problems before they become too big.

EMIS also makes it easier for the Ministry of Education to supervise many schools at once, without always traveling to each school. Finally, EMIS improves transparency and accountability. When schools know that their work is being checked regularly, they will try to do their best and manage school resources properly. EMIS makes it harder for people to hide problems or misuse school materials.

In total, EMIS can make Monitoring and Evaluation in Cameroonian secondary schools faster, easier, and more effective. It helps schools and the government to track resources, monitor school activities, and follow student performance regularly. It allows education managers to make quick and correct decisions to improve the quality of education. For EMIS to help in M&E, school staff must be well trained to collect good data and use the system properly.

Administrative Effectiveness in Secondary Education

Dimensions of Administrative Effectiveness

Administrative effectiveness in secondary schools simply means how well school leaders can manage their schools to achieve good results. It includes how school principals organize people, use resources, manage finances, and make sure that teaching and learning activities are moving forward correctly. According to Leithwood et al. (2020), when administration is effective, schools perform better, teachers work harder, students achieve more, and the school gains a good reputation in the community.

Some of the key areas of administrative effectiveness include:

- Leadership and governance: This means how school principals and other leaders guide the school, follow rules, and make decisions that help the school move forward.
- Human resource management: This is about how the school manages teachers and other staff, including recruitment, training, and supervision.
- Financial management: This involves planning, using, and controlling the school's money properly.
- Communication and stakeholder engagement: This is how the school shares information and works with teachers, parents, the community, and education authorities.
- Instructional supervision: This means how school leaders follow up to make sure that teachers are teaching well and students are learning.
- Strategic planning and evaluation: This is about setting school goals, making plans to achieve them, and checking regularly to see if the school is moving in the right direction.

When all these areas are well managed, schools are likely to perform better, teachers will feel supported, and students will have more chances to succeed. According to Bush & Glover (2016), effective school administration depends on good decision-making, regular supervision, strong accountability, and a clear vision for improvement.

In Cameroon, secondary school principals are responsible for both teaching leadership and general school administration. They do not only supervise teachers but also manage the school's day-to-day activities, staff records, financial reports, and community relations. According to Fonkem & Neba (2023), for principals to succeed in their work, they need timely and reliable data. This is where the Education Management Information System (EMIS) becomes very useful. EMIS gives school leaders quick access to important information like student numbers, teacher assignments, attendance records, financial reports, and school performance, making their work much easier.

Key Indicators of Administrative Effectiveness

There are specific indicators that can help education managers to check if school administration is effective. These include:

- Timely completion of annual work plans: Schools should prepare and complete their yearly plans on time.
- Accurate staff and student records: Schools must keep up-to-date records of teachers, students, and other staff.
- Budget execution rate: Schools must use the money they receive properly and according to the budget.
- Teacher attendance and punctuality: Teachers should come to school regularly and on time.
- Student retention and success rates: Schools should work to keep students in school and help them pass their exams.
- Stakeholder satisfaction levels: Parents, teachers, and community members should be happy with the way the school is managed.

These indicators are very important because they help school leaders and education authorities to measure whether the school is moving in the right direction. When schools use EMIS dashboards, they can follow these indicators regularly. For example, if the EMIS shows that many teachers are regularly absent, the school principal can take quick action by speaking to

the teachers, reporting to the hierarchy, or requesting more support. If EMIS data shows that many students are dropping out of school, school leaders can plan special programs to help those students return and continue learning.

The World Bank (2023) explains that using EMIS to monitor these indicators follows international standards of good school management. In modern education systems, school performance is no longer managed by guesswork but by real-time data. EMIS gives school managers the right tools to make decisions based on facts, not just personal opinions.

Conditions for EMIS to Support Administrative Effectiveness

However, the success of EMIS in improving administration depends on some important conditions.

First, school staff and education managers must know how to use the EMIS well. Without proper training, many school principals and bursars may not know how to enter data correctly or how to use the information provided by the system.

Second, the EMIS system itself must be reliable and functional. If the system is always breaking down or if internet access is poor, the benefits will be limited.

Third, school leadership must fully support the use of EMIS. If principals do not take the system seriously or if they do not encourage teachers and staff to update data regularly, EMIS will not be helpful.

When these conditions are met, EMIS can become a very strong tool to improve school management. It can help principals to supervise staff better, manage school money carefully, follow up on student success, and plan future school activities with confidence.

Administrative effectiveness is very important for the success of secondary schools in Cameroon. It helps schools to run smoothly, manage resources properly, and provide better learning opportunities for students. EMIS can play a key role in supporting effective administration by giving school leaders quick and reliable access to the information they need to make good decisions. For EMIS to truly help in school management, school staff must be trained, the system must work well, and school principals must take leadership in using EMIS regularly. When this happens, administrative effectiveness in Cameroonian secondary schools will greatly improve.

EMIS and Administrative Effectiveness: Empirical Studies

Many studies from different countries have shown that using Education Management Information Systems (EMIS) in schools can help improve the way schools are managed. EMIS helps schools to keep clear records, plan activities better, use school resources properly, and monitor what is happening in schools at all times. According to UNESCO (2023) and the World Bank (2022), when EMIS is well used, it brings a lot of positive changes to education management. In Nigeria, a big study done by Adeyemi and Ige (2021) looked at how EMIS was working in secondary schools. The study found that schools using EMIS were performing better in many areas. They were able to track their budgets correctly, plan the movement of teachers better, and follow the academic progress of their students. School principals could make quick decisions because the system was giving them fresh and accurate information. The study concluded that EMIS helped school administrators to plan well and also helped schools to work in line with government education plans.

In Ghana, a study by Mensah and Agyapong (2020) found that EMIS helped to make school management more transparent and responsible. When EMIS was used in schools, school leaders became more careful in managing money and reporting their activities because they knew they were being followed through the system. EMIS also helped to collect data that showed clearly the number of boys and girls attending school. This type of gender data helped the government to make better policies that included both boys and girls equally. It also allowed schools to quickly identify groups of learners who needed special attention.

In South Africa, Naidoo (2019) studied the use of the South African School Administration and Management System (SA-SAMS), which works in a similar way as EMIS. Naidoo found that the system helped schools to handle financial issues better and submit their reports on time. The schools that used SA-SAMS were able to keep better financial records. However, the study also found some difficulties. Many schools did not have enough trained staff to operate the system properly. Also, many schools did not receive regular system updates, which made the work more difficult. Without enough training and proper technical support, the system could not work well in some schools.

In Cameroon, studies about EMIS are still limited, but some researchers have started exploring how EMIS is working in the country. One of the key studies was done by Ngwana (2022) in public secondary schools in Yaoundé. Ngwana found that EMIS helped school principals to manage teacher attendance better. With EMIS, principals could easily see which teachers were

attending their classes regularly and which teachers were absent. However, the study also showed that EMIS was not yet helping schools to properly track and report their financial information. Many schools still faced problems like slow internet, lack of computers, poor supervision, and lack of proper training for school staff. These challenges made it difficult for the schools to enjoy the full benefits of EMIS.

Another study by Tambo and Fomban (2021) focused on schools in the North West Region of Cameroon. They found that most of the EMIS systems in that region were introduced through support from international donors, and not through local government funding. This created a problem because when donor support stopped, many schools could not continue using the system effectively. The study also showed that there was little training for school leaders on how to properly use EMIS. Tambo and Fomban advised that EMIS should be better included in national education policies and that school leaders should receive regular training to make sure the system can work well in the long term.

When we look at all these studies from Nigeria, Ghana, South Africa, and Cameroon, it is clear that EMIS can strongly improve school administration. It can help schools to plan better, manage money well, track teacher and student performance, and make fast decisions based on reliable data. EMIS can also help schools to follow international standards for managing performance and ensuring quality education.

However, all the studies agree that EMIS can only succeed if certain conditions are respected. First, school principals, teachers, and administrative staff must receive proper training on how to use EMIS. Second, the system must always be updated and there must be good technical support. Third, there must be enough computers and internet access to run the system well. Finally, the government must fully support EMIS and include it in national education policies so that the system can last for many years.

Conclusively EMIS is a powerful tool that can help make school administration in Cameroon more effective. It can help principals, teachers, and school managers to make good decisions, use resources well, and improve the quality of education. But for EMIS to succeed, there must be serious efforts to train users, provide good infrastructure, and ensure that schools and the government take full responsibility for running the system. If these things are done, EMIS can help to build a stronger, more effective education system in Cameroon.

EMIS Implementation in Sub-Saharan Africa

The experience of EMIS implementation in Sub-Saharan Africa presents a mixed situation, with both encouraging progress and serious challenges. Many countries in the region have decided to use EMIS to improve the management of their education systems, make schools more transparent, and ensure better planning. However, several countries still face big problems, especially concerning poor infrastructure, lack of skilled workers, weak data management practices, and poor coordination between different education authorities (UIS, 2023).

Progress and Best Practices

Even with these challenges, some countries in Sub-Saharan Africa have made very good progress in using EMIS effectively. One good example is Rwanda. Rwanda has successfully introduced an EMIS that includes real-time dashboards, mobile data entry, and geographic mapping tools (GIS). This system helps the Ministry of Education to quickly see where schools are located, follow up on student dropouts, and monitor the academic performance of schools in real time. According to the Rwanda Ministry of Education (2021), this system has made it easier for the government to plan education activities and to share resources fairly between schools.

In Ethiopia, the government has built a centralized EMIS system that connects the school data directly to the national education finance system. This system helps the country to track how education budgets are used and to make sure money is allocated based on real results, not just estimates. According to Sabates et al. (2022), this system has made education financing more transparent and more efficient.

Ghana has also made very good progress. Ghana's EMIS is fully linked to the Education Accountability Dashboard, a powerful system that brings together school management information and student learning results. This helps the Ghanaian education authorities to track school performance, teacher attendance, and student outcomes in one place. According to the World Bank (2022), this has greatly improved school supervision and made it easier to hold school leaders accountable.

These countries share some best practices that have made their EMIS work well. First, there is strong government support and EMIS is well integrated into national education policies. Second, schools and local education offices are allowed to access and use the system directly,

making data management faster and more accurate. Third, these countries have special EMIS teams at both national and regional levels that focus on maintaining and updating the system. Finally, they invest regularly in training teachers, school principals, and education officers to make sure they know how to use the system properly.

Common Challenges

Even though there has been progress, many common challenges still exist in Sub-Saharan Africa when it comes to using EMIS successfully. One major problem is limited infrastructure. Many schools, especially those in rural villages and hard-to-reach areas, do not have stable electricity or reliable internet access. Without these basic tools, using EMIS becomes very difficult. Another big challenge is the problem of data quality. In many schools, the information that is entered into EMIS is sometimes incomplete, entered late, or contains mistakes. Some schools even enter the same data twice, which causes confusion and makes the system unreliable. When the data is not correct, school leaders and government officers cannot make good decisions. Added to the above point, low usage of the system is a big issue. Even when EMIS is available, many school administrators and teachers do not use it regularly. Sometimes this happens because they are not trained well. Other times, it happens because they are not motivated or do not understand the importance of the system.

to conclude, there is the problem of fragmentation. In some countries, there are different EMIS platforms being used for various education sectors like basic education, technical schools, and secondary education. When these systems do not talk to each other or are not connected, it creates duplication and makes it difficult to get a complete picture of the whole education system.

Lessons for Cameroon

When we look at the experiences of other African countries, Cameroon can learn valuable lessons. First, Cameroon should adopt scalable and flexible systems like OpenEMIS, which is an open-source platform that many developing countries are using successfully. OpenEMIS is cheaper, easy to customize, and works even in places with low internet coverage.

Second, Cameroon must invest in improving school infrastructure, especially in rural areas. Without electricity, computers, and good internet, EMIS cannot work properly. There must also be continuous training programs to help school principals, administrative staff, and teachers to develop the necessary skills to use the system effectively.

Third, Cameroon should aim to fully integrate EMIS into its national education planning. This means that EMIS should not only be seen as a project supported by donors but as a long-term strategy supported by the government, with proper budgets and follow-up structures.

Finally, Cameroon can benefit by making sure that all levels of the education system school, regional, and national are connected. Schools should be able to send data directly to the central system and also use the system to improve their own daily management. The Sub-Saharan African experience shows that EMIS is a very powerful tool that can help countries improve their education systems. However, EMIS can only work well if it is properly supported with good infrastructure, strong leadership, committed users, and national policies that make it part of everyday school management. Cameroon has the chance to build on the successes of other countries and avoid some of their mistakes by planning carefully and investing wisely.

Challenges in the Implementation and Utilization of EMIS

Implementation of EMIS in educational systems is often fraught with operational, technical, and institutional barriers. In Cameroon and similar developing contexts, these challenges significantly limit the effectiveness of EMIS at the school level.

Infrastructure Constraints

One of the primary barriers to EMIS implementation is inadequate infrastructure. Many schools lack reliable electricity, internet connectivity, and computing equipment. According to MINESEC (2023), only about 45% of public secondary schools in urban areas like Mfoundi Division have stable internet access, while rural areas are even more underserved. Without the necessary hardware and connectivity, data collection and reporting become delayed and fragmented. This undermines the entire purpose of having an integrated management system and limits school autonomy in using EMIS for internal decision-making (Fonkem & Neba, 2023).

Human Capacity and Training Gaps

Another persistent challenge is the lack of capacity among school administrators and support staff to operate EMIS tools. Many school heads lack formal ICT training, and EMIS platforms often lack user-friendly interfaces. In a national study conducted by the Ministry of Basic Education (MINEDUB, 2022), less than 30% of school principals reported confidence in using EMIS tools without assistance. Training programs, where available, are often donor-funded and

not sustained, leading to low retention of skills and poor institutional memory. Furthermore, lack of support staff such as data clerks places a burden on already overwhelmed school administrators.

Data Quality and Standardization Issues

The value of EMIS lies in the quality of data it processes. However, in many Cameroonian schools, data collection is done manually and digitized later, introducing errors and delays. According to Ngwana (2022), inconsistencies in data definitions, indicators, and validation mechanisms create significant challenges in aggregating and comparing data across schools. Standardization of indicators, integration of verification processes, and automation of data collection tools are necessary to overcome these barriers.

Institutional Coordination and Policy Alignment

Fragmented governance and overlapping mandates between MINEDUB, MINESEC, and regional delegations impede smooth EMIS implementation. Although the Education Sector Strategy Plan (2023–2030) calls for integrated planning and unified data systems, institutional silos persist (Republic of Cameroon, 2020). Moreover, many schools perceive EMIS as a tool for upward accountability only, rather than as a resource to support school-level planning and improvement (Tambo & Fomban, 2021). This perception undermines motivation and utilization of EMIS at the local level.

The Cameroonian Context of EMIS Use National Education Policies and EMIS Integration

Cameroon’s commitment to education sector reform is reflected in several key policy documents:

- **Law No. 98/004 of 14 April 1998** lays the foundation for the organization of the education system and encourages the use of technologies in educational planning and management.
- **National Development Strategy 2020–2030 (NDS30)** emphasizes the digital transformation of public services, including education.
- **Education Sector Strategy Plan 2023–2030** explicitly highlights EMIS as a strategic pillar in improving planning, budgeting, and monitoring in the education sector.

These policies provide a favourable framework for EMIS expansion, but effective implementation at the school level remains inconsistent. For example, despite the inclusion of EMIS in strategic planning documents, school administrators often lack the autonomy and capacity to use the system for local decision-making (MINESEC, 2023). In Cameroon, the government has shown strong interest in improving the education sector by using modern management tools like the Education Management Information System (EMIS). Several important national education policies and development plans clearly support the introduction and use of EMIS at different levels of the education system.

One key policy is Law No. 98/004 of 14 April 1998, which sets the general structure and organization of education in Cameroon. This law encourages the use of new technologies to improve the way schools are managed and how education is planned across the country. It shows that even from the early stages, Cameroon was thinking about modernizing its education system using technology.

Another major national document is the National Development Strategy 2020–2030 (NDS30). This strategy highlights the importance of digital transformation in public services, including education. The NDS30 encourages the use of information systems to make government operations faster, more transparent, and more effective. In the education sector, this means schools, regional delegations, and the Ministry of Secondary Education (MINESEC) should all use digital tools like EMIS to manage their work better.

Furthermore, the Education Sector Strategy Plan (ESSP) 2023–2030 is a very important document that directly places EMIS at the centre of educational reform. The plan identifies EMIS as a strategic pillar that can help improve planning, budgeting, monitoring, and evaluation in the education sector. The ESSP shows that EMIS is not just an optional tool—it is seen as essential for making sure that education resources are well managed and that student learning outcomes are improved across the country.

Policy Framework versus Implementation Reality

Although Cameroon has good education policies that support the use of EMIS, there is still a big difference between what is written in the documents and what happens in schools. Many schools and local education offices struggle to implement EMIS effectively. In theory, EMIS should help schools collect data, plan activities, manage resources, and make decisions based on accurate information. However, in practice, the situation is different.

According to MINESEC (2023), many school administrators in Cameroon do not yet have the freedom, training, or proper equipment to fully use EMIS for their day-to-day management. In some cases, EMIS is still seen as a tool that is controlled by the central administration, with limited access for schools and regional offices. This limits the ability of school principals to use EMIS for local decision-making. For example, they may not be able to generate reports on student performance or staff attendance in real-time, even though the system is designed to do exactly that.

Another challenge is that in many schools, the infrastructure is not yet in place to support the regular use of EMIS. Some schools lack computers, stable internet connections, and reliable electricity, especially in rural areas. In addition, many school staff members have not been properly trained to use EMIS, making it difficult for them to enter data correctly, produce reports, or use the system to guide their management decisions. There is also a problem of supervision and follow-up. Even though EMIS is promoted at the national level, there is often weak monitoring to ensure that schools are using the system regularly and correctly. This gap reduces the value of the data that EMIS can provide because if data is not regularly updated or is poorly entered, decision-makers at higher levels may be working with inaccurate information.

Moving Toward Effective EMIS Utilization

To fully benefit from the EMIS system, Cameroon needs to bridge the gap between policy and practice. First, there should be stronger investments in infrastructure and capacity building at the school level, especially in rural and underserved areas. Computers, internet access, and electricity must be made available to support EMIS use.

Second, school principals, bursars, secretaries, and education officers should receive continuous, practical training on how to use EMIS not just as a reporting tool, but as a decision-making and planning system that can help them improve school management daily.

Third, decentralization must be more effective. Schools should have more freedom and control over how they use EMIS data to manage their resources and solve their local problems. When EMIS is fully accessible to schools, it can help them to track attendance, manage finances, monitor student performance, and plan school activities more efficiently and finally, Cameroon should strengthen supervision, monitoring, and technical support at all levels. Regional and divisional education offices must regularly check how EMIS is being used in schools and provide assistance where needed to ensure that the system is being properly implemented.

EMIS in Mfoundi Division Secondary Schools

The Mfoundi Division, which includes Yaoundé, the capital city of Cameroon, provides a unique setting for the use of the Education Management Information System (EMIS) in secondary schools. Compared to many rural areas in the country, schools in Mfoundi Division generally have better infrastructure, more stable electricity, improved internet access, and closer supervision from educational authorities. These factors create a more favourable environment for EMIS adoption. However, despite these advantages, the use of EMIS in secondary schools in the Mfoundi Division still faces several serious limitations.

Partial Adoption of EMIS Modules

Research shows that many secondary schools in Yaoundé and its surrounding areas still rely on hybrid management systems. This means that schools combine both paper-based records and digital tools, instead of fully moving to computerized systems. According to Ngwana (2022), this mixed approach reduces the effectiveness of EMIS because the system is not being fully used to manage school activities. In most cases, schools continue to keep physical registers for student records, staff attendance, and financial transactions, while only a few processes, like student registration and examination tracking, are handled digitally.

Preliminary surveys conducted in selected secondary schools in Yaoundé confirm that while Student Information Systems (SIS) modules used for student enrolment, class lists, and exam result recording are being introduced, other important EMIS modules are largely ignored. For example, Human Resource Information Systems (HRIS), which are supposed to help track teacher deployment, attendance, and workload, are not yet widely used. Similarly, financial management modules, which can improve transparency and control of school budgets, are almost absent at the school level. This limited use of the system reduces the potential of EMIS to fully support school management and decision-making.

EMIS Used Mainly for Ministry Reporting

Another major issue in the Mfoundi Division is that EMIS is often used only for administrative reporting to satisfy the requirements of the Ministry of Secondary Education (MINESEC). Schools are mostly concerned with entering data that is requested by higher authorities, such as student enrolments numbers, examination statistics, or staff lists. The use of EMIS as a tool to actively manage school performance, monitor internal processes, and support local decision-making is very low. In most cases, school principals and staff see EMIS as a reporting obligation

rather than as a tool that can help them solve everyday management problems. This limited view of EMIS weakens its impact at the school level.

Capacity Building and Coordination Challenges

The Regional Delegation for Secondary Education in the Centre Region has played an important role in promoting EMIS in secondary schools in Yaoundé. The delegation has provided some training sessions and basic sensitization to encourage school administrators to use the system. However, there are still big gaps in coordination and technical support. According to Tambo & Fomban (2021), many schools struggle with a lack of user manuals, limited access to software updates, and irregular training opportunities. These challenges make it difficult for school staff to fully understand how to use EMIS and to keep their systems up to date. Schools often face IT support problems. When technical issues occur, such as system errors or login failures, there are no local IT officers available to provide quick solutions. School staff are sometimes forced to abandon the system and return to manual records because they cannot solve the technical problems on their own. This situation leads to frustration and discourages the regular use of EMIS.

Limited Local Ownership and Motivation

Another challenge is the lack of strong ownership and motivation among school administrators and teachers. Because EMIS is often seen as a top-down system controlled by the central ministry, many school leaders do not feel that they have real control or benefits from using it. Some staff view EMIS as an extra workload, especially when they are required to enter data but receive no feedback or support to help them use the information for school improvement. This weakens the commitment of school staff to actively engage with the system and take advantage of its full capabilities.

The Way Forward

For EMIS to be fully effective in the Mfoundi Division, several actions need to be taken. First, capacity-building activities must be strengthened. Training should not only cover how to enter data but also how to use EMIS for internal planning, monitoring, and evaluation. Second, technical support teams should be available at the divisional or sub-divisional levels to assist schools with system maintenance, software updates, and troubleshooting.

Third, schools should be given greater decision-making power and encouragement to use EMIS not just for ministry reports but as a daily management tool that can help them improve student learning, track staff performance, and manage school resources better. Finally, the Ministry of Secondary Education should work on improving feedback mechanisms, so that schools can see how the data they provide contributes to policymaking and school improvement strategies. While secondary schools in the Mfoundi Division are in a better position to adopt EMIS due to their location in the capital city, the system is still underutilized and faces many practical challenges. With improved training, stronger local support, better system updates, and increased school-level ownership, EMIS can become a powerful tool to support effective school management and improve the overall quality of education in the division.

Research Gaps

Despite a substantial body of literature on Education Management Information Systems (EMIS), several critical gaps remain especially in relation to their application in Sub-Saharan African contexts and, more specifically, in Cameroon's secondary education system. These gaps are evident across theoretical, empirical, and contextual dimensions and justify the relevance of the present study.

Limited Contextual Research in Cameroon

Although EMIS is recognized in Cameroon's Education Sector Strategy Plan (2023–2030) as a priority tool for planning and monitoring, few empirical studies have systematically investigated its impact on administrative effectiveness in Cameroonian secondary schools. Existing research such as Ngwana (2022) and Tambo and Fomban (2021) focuses primarily on structural challenges, neglecting school-level outcomes and user engagement. The lack of localized, disaggregated research hinders the formulation of context-specific policies and capacity-building programs.

Moreover, most EMIS-related studies in Cameroon are concentrated at the central ministry level or on macro policy frameworks. Little is known about how secondary school administrators in urban divisions like Mfoundi perceive, interact with, and utilize EMIS in their day-to-day operations. Understanding these micro-level dynamics is essential to improving system design and implementation strategies.

Lack of Integration with Administrative Effectiveness Frameworks

International studies link EMIS usage to improved administrative performance (Naidoo, 2019; Adeyemi & Ige, 2021), few studies use comprehensive school administration frameworks to measure effectiveness. The absence of standard benchmarks such as indicators for timeliness, accuracy, accountability, and responsiveness limits comparative and evaluative analysis. Consequently, the relationship between EMIS and specific dimensions of school leadership and governance remains under-theorized. This study addresses the gap by aligning EMIS functionalities with administrative effectiveness indicators such as human resource management, financial management, communication, instructional supervision, and decision-making. This will enable the derivation of empirical relationships and contextualized recommendations.

Fragmented Evidence on EMIS Functional Modules

Another gap in the literature is the inconsistent examination of EMIS functional modules. Most studies discuss EMIS as a holistic tool without disaggregating its various components such as Student Information Systems (SIS), Human Resources Information Systems (HRIS), and finance modules. This generalization masks potential discrepancies in implementation and performance across modules. For instance, a school may effectively use SIS for tracking enrollment but fail to utilize HRIS or fee management tools due to system complexity or lack of training. This study aims to evaluate each module separately to identify strengths and weaknesses and to suggest targeted improvements.

Limited Focus on Urban Educational Challenges

Urban divisions like Mfoundi face specific administrative challenges such as overcrowding, high student-teacher ratios, and complex stakeholder expectations. Most EMIS research in Africa is rural-focused, exploring access disparities and infrastructural gaps (Sabates et al., 2022). While important, this leaves a gap in understanding how EMIS can support urban school leadership in high-pressure environments. Given that urban areas often serve as models for national policy rollouts, analysing EMIS effectiveness in Mfoundi Division can yield scalable insights for other regions. This study fills this gap by exploring EMIS performance in an urban education context.

Absence of Stakeholder-Centred Analysis

Finally, existing EMIS literature seldom integrates the voices of frontline users' school principals, administrative assistants, and regional education officers. Most studies are top-down, focusing on policy or system architecture rather than actual user experiences and constraints. This omission limits the design of responsive training, support, and feedback mechanisms. By employing a mixed-methods approach including interviews and document analysis, this study centres the perspectives of school-level actors, thereby enriching the literature with grounded, practical insights that can inform future EMIS improvements in Cameroon.

Summary of Literature Review

This chapter provided a comprehensive review of scholarly and policy literature on the role of Education Management Information Systems (EMIS) in promoting administrative effectiveness in education, with specific reference to secondary schools in Mfoundi Division, Yaoundé. The key findings and conclusions drawn from the literature are summarized thematically below.

Conceptual and Theoretical Insights

The review began by clarifying key concepts EMIS, administrative effectiveness, and, where applicable, non-formal education. EMIS was defined as a digital system for data collection, management, and use to support educational planning and decision-making (UNESCO, 2023). Administrative effectiveness was framed around performance indicators in school leadership, resource management, communication, and governance. Two theoretical frameworks underpinned the analysis: Systems Theory, which conceptualizes schools as interdependent sub-systems requiring integration through EMIS; and Management Information Systems (MIS) Theory, which explores how information technologies support institutional goals and managerial processes. These theories justified the use of EMIS as a system-level tool to improve school administration and performance.

Functionalities and Applications of EMIS

The chapter reviewed the key modules of EMIS Student Information Systems (SIS), Human Resource Information Systems (HRIS), finance modules, and infrastructure tracking tools. Evidence from global and regional contexts confirmed that EMIS contributes to:

- Enhanced enrolments and attendance tracking (SIS)
- Improved teacher deployment and evaluation (HRIS)
- Transparent fee collection and budget monitoring (Finance Modules)
- Data-informed infrastructure planning (GIS integration)

In Cameroon, however, the utilization of these modules is uneven, with most schools relying on manual or semi-digital systems due to capacity, training, and infrastructure gaps.

Role of EMIS in Planning, Decision-Making, and M&E

A major finding across reviewed studies was that EMIS facilitates evidence-based decision-making, real-time planning, and continuous monitoring and evaluation. These capabilities are critical for both routine administration and strategic development. Nevertheless, data quality issues, lack of institutional ownership, and technical fragmentation continue to undermine the effectiveness of EMIS, particularly in decentralized contexts like Mfoundi. The literature also emphasized that EMIS could contribute to educational equity by generating disaggregated data for gender, disability, and region. However, these possibilities remain underexploited in the Cameroonian context.

Empirical Evidence and Regional Trends

Empirical studies from Nigeria, Ghana, Rwanda, and South Africa demonstrated that EMIS positively impacts transparency, teacher accountability, and financial management provided that adequate infrastructure and training are available. In contrast, evidence from Cameroon is sparse and mostly limited to pilot programs and top-down evaluations, with little focus on secondary schools or end-users. The literature from Sub-Saharan Africa revealed shared challenges such as low institutional capacity, poor data culture, and system duplication. However, it also highlighted best practices in government ownership, user training, and integration with performance-based financing.

Challenges and Contextual Realities in Cameroon

Cameroon's policy framework comprising Law No. 98/004 (1998), NDS 2030, and the ESSP (2023–2030) recognizes EMIS as a cornerstone of educational reform. Nevertheless, challenges such as fragmented data systems, underfunded training, low system uptake, and infrastructural constraints remain persistent. In Mfoundi Division, some secondary schools have adopted digital student records and basic EMIS modules. However, usage remains compliance-driven

rather than decision-driven. This limits the system's utility in enhancing administrative effectiveness.

Identified Research Gaps

The literature review concluded by highlighting key research gaps, including:

- Lack of school-level and urban-focused studies in Cameroon
- Inadequate alignment of EMIS studies with comprehensive administrative effectiveness frameworks
- Underrepresentation of user perspectives and system functionality breakdowns

These gaps justify the relevance of the current study, which seeks to explore the role of EMIS in enhancing administrative effectiveness in selected secondary schools in Mfoundi Division through a multi-dimensional and context-sensitive lens.

CHAPTER THREE: RESEARCH METHODOLOGY

This chapter describes the research methodology adopted to investigate the role of the Education Management Information System (EMIS) in enhancing non-formal education in Mfoundi Division, Cameroon. Methodology is the structured, systematic plan that guides the entire research process from defining the research questions to collecting, analysing, and interpreting data (Creswell & Creswell, 2018). A robust methodology ensures the study's credibility, reliability, and validity, allowing other researchers to understand, evaluate, and replicate the work if needed. Given the study's complex objectives assessing EMIS awareness, adoption, barriers, and its use for planning, data management, and monitoring a comprehensive and well-justified methodological framework was essential. This chapter outlines the philosophical paradigm that guided the study, explains the choice of research design, details the rationale for a mixed-methods approach, describes the area of the study, defines the population and sampling strategies, and elaborates on data collection instruments, pilot testing, procedures, analysis techniques, trustworthiness measures, researcher positionality, ethical considerations, and limitations.

Research Paradigm

The research is grounded in the pragmatic paradigm, which is increasingly favoured in applied educational research for its flexibility and problem-centred orientation (Creswell & Plano Clark, 2017; Tashakkori & Teddlie, 2010). Pragmatism moves beyond the rigid dichotomy between positivism (associated with quantitative methods) and constructivism/interpretivism (associated with qualitative methods). Instead, it prioritizes practical solutions to real-world problems using all available methodological tools. In this study, the pragmatic paradigm was adopted because of the complex, multi-layered nature of EMIS adoption in non-formal education contexts. Issues such as training gaps, infrastructural challenges, organizational culture, policy mandates, and staff perceptions cannot be captured fully by either quantitative or qualitative approaches alone.

Pragmatism justifies combining these approaches in an integrated way to provide a more comprehensive answer to the research questions. As Johnson and Onwuegbuzie (2004) note, the pragmatic paradigm allows researchers to “use what works” to achieve the best understanding of the phenomenon under investigation. By embracing this paradigm, the study

ensures relevance to policymakers, educators, and administrators aiming to improve EMIS implementation in the Cameroonian context.

Research Design

Convergent parallel mixed-methods design

The study employed a convergent parallel mixed-methods design, one of the most widely accepted models for integrating quantitative and qualitative data in educational research (Creswell & Plano Clark, 2017). In this design, both types of data are collected during the same phase of the research process, analysed separately to preserve the integrity of each dataset, and then merged during interpretation to develop a richer, more nuanced understanding of the research problem. This approach recognizes that complex educational issues, such as the adoption and use of EMIS in non-formal education settings, cannot be fully understood through a single methodological lens. By conducting quantitative surveys and qualitative interviews concurrently, the study ensured that numerical trends and descriptive patterns could be interpreted alongside participants detailed personal accounts, creating a more holistic picture of EMIS implementation.

This design was deliberately chosen to align with the study's specific objectives, which required both breadth and depth. Quantitatively, the study sought to measure the extent of EMIS awareness, adoption, and usage patterns across different types of non-formal education centers. Qualitatively, it aimed to explore in depth the human, organizational, and infrastructural barriers that influence EMIS adoption and effectiveness. Collecting both types of data concurrently allowed for triangulation, a strategy that enhances validity by cross-verifying findings from multiple sources (Greene, Caracelli, & Graham, 1989). For instance, survey data showing low rates of EMIS use for monitoring learning achievement could be directly compared with interview narratives explaining barriers such as inadequate training, lack of standardized assessment tools, or infrastructural challenges. This complementary integration strengthened the study's capacity to offer practical, evidence-based recommendations for policymakers and educators.

Table 1: Alignment of Research Questions with Methods

Research Question	Quantitative Method	Qualitative Method
How does EMIS support planning and coordination in non-formal education?	Structured questionnaire (frequencies, cross-tabs)	Semi-structured interviews (experiences, perceptions)
How does EMIS facilitate data collection, analysis, and reporting?	Structured questionnaire (descriptive stats)	Semi-structured interviews (barriers, context)
What role does EMIS play in monitoring enrolment, attendance, achievement?	Structured questionnaire (usage rates)	Semi-structured interviews (practical challenges)

This table demonstrates how each research question was addressed using both quantitative and qualitative tools, ensuring comprehensive coverage. The convergent design was especially well-suited to education management research in Cameroon because of the need to inform both policy (requiring quantifiable trends) and practice (requiring contextual understanding). As advised by Creswell and Creswell (2018), convergent designs are valuable when both types of data are equally important to addressing the problem.

The decision to adopt a mixed-methods approach was guided by both the nature of the research problem and theoretical considerations. EMIS adoption in non-formal education is not simply a technical question of whether staff know how to enter data. It is a complex systems issue involving training, infrastructure, leadership support, policy compliance pressures, staff attitudes, and cultural resistance to change.

Quantitative data alone would provide descriptive statistics about who is aware of EMIS, how often it is used, and where gaps exist. While valuable, such data cannot explain why those gaps exist or how staff experience the barriers in practice. For example, Chapter Four’s quantitative finding that 55% of centers “never” record achievement data in EMIS would be incomplete without qualitative explanations about the lack of standardized assessment tools or unreliable internet preventing real-time entry. Qualitative data, on the other hand, offers depth and context, capturing the voices of center directors, instructors, and administrative staff in their own words. Interviews revealed themes like fragmented manual systems, capacity gaps, infrastructural inequities, and perceptions of EMIS as a mere compliance burden rather than a planning tool.

By combining both strands, the study achieves complementarity (Greene et al., 1989), where quantitative results identify the scale of issues and qualitative results explain the underlying causes. Furthermore, policy relevance demanded mixed-methods rigor. Decision-makers

require both solid data on adoption rates (to justify investments) and rich explanations of barriers (to design effective interventions). As Tashakkori and Teddlie (2010) argue, mixed-methods approaches are particularly well-suited for applied research aiming to inform policy and practice in complex social systems.

Area of the Study

The study was conducted in Mfoundi Division, located in the Centre Region of Cameroon, which serves as both the administrative and political heart of the country. Mfoundi hosts Yaoundé, the national capital, and embodies a unique convergence of urban, peri-urban, and rural contexts that significantly shape education policy implementation and service delivery. This diversity creates complex challenges and opportunities for educational planning, resource allocation, and data management systems like EMIS. Given its role as the seat of national government, Mfoundi benefits from relatively advanced infrastructure in some areas, but it also includes under-resourced communities where access to technology and trained personnel can be uneven. These contrasts make it a strategically important setting for exploring how EMIS functions across different operational realities within the same administrative division.

Non-formal education in Mfoundi encompasses a wide-ranging network of government literacy centers, NGO and community-based organizations, and private training institutes, each with distinct funding models, governance structures, and service priorities. Government centers often receive more direct support, formal oversight, and alignment with Ministry of Basic Education policies, including EMISs mandates. In contrast, NGO and community-based centers frequently depend on donor funding, volunteer instructors, and locally driven management approaches, which can limit their access to standardized training and technological resources. Importantly, Mfoundi has also served as a priority region for national EMIS roll-out initiatives, making it a highly relevant case study for assessing both the successes and persistent gaps in system adoption. The presence of the Ministry's central offices and regional delegations in Yaoundé further facilitated access to key policymakers and administrators who influence EMIS policy design, capacity-building efforts, and implementation practices throughout Cameroon.

Population of the Study

The study's population comprised all administrators and instructional staff engaged in non-formal education in Mfoundi Division. This included Center Directors, who are responsible for planning, management, and preparing official reports that feed into EMIS; Literacy Instructors,

who deliver learning programs, enroll students, and maintain learner records essential for EMIS data entry; Data Clerks and Administrative Staff, who handle the day-to-day data entry, record-keeping, and submission of EMIS reports; and Regional or Divisional Education Officers, who oversee policy implementation, provide supervision, and monitor compliance with national EMIS guidelines. These diverse roles reflect the organizational layers through which EMIS is expected to operate, from grassroots data collection to strategic planning and oversight at the divisional level.

This population was carefully chosen because these stakeholder groups collectively mediate EMIS use in non-formal education settings. Their participation was essential for understanding not only EMIS awareness and training needs, but also the practical challenges of data entry, such as inconsistencies, delays, and limited digital literacy. Furthermore, these groups could speak directly to infrastructural and resource gaps, including unreliable internet and insufficient equipment, which limit EMIS adoption. By engaging both frontline staff and higher-level administrators, the study ensured it would capture a holistic perspective on barriers and opportunities for EMIS integration, including the influence of organizational culture, leadership commitment, and policy enforcement in shaping system adoption and effectiveness.

Table 2 : Key Stakeholder Groups in the Study Population

Role	Main Responsibilities	Relevance to EMIS Use
Center Directors	Management, planning, supervision	Oversee EMIS reporting, ensure data quality
Literacy Instructors	Teaching, enrollment, attendance management	Enter and track learner data in EMIS
Data Clerks/Administrative Staff	Data entry, record-keeping, reporting	Directly handle EMIS system
Regional/Divisional Officers	Policy supervision, oversight, training, facilitation	Ensure compliance, guide center-level implementation

Sampling Strategy

Given the study’s mixed-methods design, a multi-stage sampling strategy was adopted to ensure both representativeness for the quantitative survey and depth for the qualitative interviews. This approach combined stratified random sampling for the quantitative component with purposive sampling for the qualitative component, in line with best practices in educational research (Creswell & Plano Clark, 2017). For the survey, the sampling frame consisted of all identified

non-formal education centers in Mfoundi Division, which were stratified by institution type: government literacy centers, NGO/community-based centers, and private training centers. Stratification was essential to ensure proportional representation of these categories, recognizing that EMIS adoption, infrastructure quality, and funding sources differ significantly between them. Within each stratum, centers were randomly selected to minimize selection bias, ensuring that the sample reflected the diverse operational realities across the division.

For the qualitative component, purposive sampling was used to identify participants with deep, relevant experience who could provide rich, context-specific insights into EMIS adoption and barriers. This strategy targeted Ministry officials and regional delegates responsible for policy oversight and supervision, NGO managers familiar with the challenges of donor-dependent operations, center directors who manage EMIS reporting obligations, and instructors and clerks who perform daily data entry and monitoring tasks. Such deliberate selection ensured that the interviews captured diverse perspectives across institutional hierarchies and operational roles. By choosing participants with firsthand knowledge of EMIS processes, challenges, and training experiences, purposive sampling supported the study’s goal of revealing the complex, layered barriers and practical challenges that would remain hidden in a purely survey-based approach.

Table 3 : Sampling Strategy by Component

Component	Sampling Method	Justification
Quantitative Survey	Stratified Random Sampling	Ensure proportional representation across institution types
Qualitative Interviews	Purposive Sampling	Select knowledgeable participants for in-depth insights

This table shows how sampling strategies were tailored to the distinct goals of each methodological component.

Sample Size Justification

Sample size decisions in this study were carefully guided by established methodological recommendations, practical field realities, and the need to balance breadth and depth of insight. For the quantitative component, a total of 50 participants completed the structured questionnaire. This sample size was justified on multiple grounds. First, it ensured sufficient cases for meaningful subgroup analysis by institution type, satisfying the recommended minimum cell sizes of 10–15 respondents for reliable cross-tabulations (Cohen, Manion, & Morrison, 2018). Second, it maintained a balance between representativeness and feasibility,

considering logistical challenges, limited resources, and time constraints involved in field data collection across diverse centers. Third, it exceeded the minimum thresholds typically recommended for descriptive survey research in single-region educational studies, which often rely on sample sizes of 30–50 participants to identify and interpret meaningful trends (Creswell, 2018). The sample was also proportionally stratified to reflect the actual landscape of non-formal education centers in Mfoundi Division: approximately 40% government centers, 50% NGO/community-based centers, and 10% private training centers. This proportional distribution ensured that the survey results would capture the varied experiences and contexts influencing EMIS adoption.

For the qualitative component, the study purposively selected 10 key informants for in-depth, semi-structured interviews. This sample size was chosen strategically to achieve thematic saturation, which is generally attained with 6–12 interviews when participants are carefully selected for their relevance and knowledge (Guest, Bunce, & Johnson, 2006). The selection emphasized diversity of roles and perspectives, including Ministry officials, regional delegates, NGO managers, center directors, and instructors or data clerks directly engaged with EMIS tasks. Such diversity was crucial for uncovering the multi-dimensional barriers to EMIS adoption and for contextualizing quantitative trends with rich, qualitative insights. By combining these carefully calculated sample sizes, the study maintained methodological rigor and analytic depth while remaining feasible and manageable within the available resources and time constraints of a master’s-level research project.

Table 4 : Sample Size Distribution

Component	Sample Size	Distribution Criteria
Quantitative Survey	50	Stratified by institution type
Qualitative Interviews	10	Purposive selection of knowledgeable informants

This table summarizes how sample sizes were determined to match the study’s objectives and methodological standards.

Data Collection Instruments

The study employed two primary data collection instruments that aligned with its convergent mixed-methods design, ensuring both breadth and depth in exploring EMIS adoption in non-formal education settings. First, a structured questionnaire was developed for the quantitative component to systematically capture descriptive and quantifiable data. This instrument gathered

information on respondents’ demographic and professional characteristics, levels of EMIS awareness, frequency and types of EMIS use, and perceived barriers to effective adoption. Items were primarily closed-ended and included Likert-type scales to facilitate consistent responses and support statistical analysis. Questions were carefully organized thematically to directly mirror the research objectives, ensuring logical flow and coherence throughout the instrument (Bryman, 2016). For example, dedicated sections addressed EMIS use for enrolment tracking, planning and coordination, data analysis and reporting, attendance monitoring, and recording learning achievement, reflecting the categories analysed in Chapter Four. This structured design ensured the generation of reliable, comparable data across diverse institution types and participant roles.

The semi-structured interview guide was developed for the qualitative component to complement the survey by providing in-depth, nuanced insights into participants’ experiences with EMIS. This instrument featured open-ended questions and flexible prompts designed to encourage participants to share rich, detailed accounts of their day-to-day challenges, successes, training experiences, infrastructural constraints, and the influence of organizational culture on EMIS use. By allowing participants to express their perspectives in their own words, the guide enabled the researcher to uncover underlying reasons behind quantitative patterns such as why certain EMIS functions were underused or what specific barriers inhibited adoption. As Creswell (2018) emphasizes, semi-structured interviews are essential tools for understanding complex social phenomena in context, allowing researchers to probe beyond surface-level responses and capture the depth of meaning that shapes human behaviour and institutional practice. Together, these two instruments ensured that the study produced integrated, policy-relevant insights grounded in both statistical trends and lived experience.

Table 5 : Overview of Data Collection Instruments

Instrument	Purpose	Data Captured
Structured Questionnaire	Quantify awareness, adoption, barriers	Demographics, EMIS use frequency, barriers
Semi-Structured Interview Guide	Explore experiences, perceptions	Training gaps, infrastructure issues, cultural factors

This table shows how each instrument was aligned with the study’s research questions and mixed-methods strategy.

Instrument Development and Validation

Instrument development for this study followed an iterative, evidence-based process to ensure validity, reliability, and contextual appropriateness, critical elements for producing credible educational research. The questionnaire was designed through a thorough review of EMIS adoption literature in Sub-Saharan Africa (UNESCO, 2022; Sabates et al., 2022), identifying common challenges such as infrastructure gaps, training needs, and policy enforcement barriers. This literature provided a solid empirical foundation for item development, ensuring that the survey would capture both globally recognized issues and regionally specific realities. Recognizing Cameroon's bilingual context, initial drafts were carefully developed in both English and French to accommodate local language use, promote inclusivity, and avoid misinterpretation among diverse respondents. The dual-language approach also underscored the commitment to cultural sensitivity and accessibility, helping ensure that respondents from government, NGO, and private institutions could fully understand and engage with the instrument.

To strengthen content validity, the questionnaire and semi-structured interview guide underwent expert review by five professionals, including university-based education researchers and regional non-formal education administrators with direct experience in EMIS policy and practice. Reviewers provided detailed feedback on the clarity and simplicity of wording, helping ensure questions would be easily understood by participants with varying literacy levels and technical backgrounds. They also evaluated the instruments for cultural appropriateness and relevance, ensuring that questions reflected the realities of non-formal education centers in Mfoundi Division. Finally, reviewers assessed the alignment of items with the study's research questions and objectives, ensuring comprehensive coverage of themes such as EMIS awareness, usage patterns, training access, and infrastructural barriers. Based on this expert feedback, the instruments were revised extensively: items were rephrased for clarity, redundant questions were removed, and new items were added to address issues identified during the review, such as questions on internet connectivity challenges a barrier highlighted as critical in the local context.

Table 6 : Instrument Validation Process

Step	Action Taken	Outcome
Literature Review	Identified common EMIS barriers and usage patterns	Informed item development
Expert Review	Five reviewers assessed content and relevance	Revisions for clarity and contextual fit
Language Adaptation	Drafted in English and French	Ensured linguistic and cultural appropriateness

This table outlines the rigorous steps taken to ensure that instruments were valid and suitable for the study context.

Interview Guide Development

Interview guide development followed a similarly rigorous and reflective process, combining insights from literature review and expert consultation to ensure relevance and depth. Drawing on existing research on EMIS adoption and educational management in Sub-Saharan Africa, the semi-structured guide was designed to encourage rich, detailed narratives from participants while maintaining alignment with the study's core research questions. Questions were crafted to cover all thematic areas of interest including EMIS awareness, training experiences, infrastructural challenges, data management practices, and organizational culture without being overly prescriptive. This balance was essential to allow participants the freedom to highlight issues they found most significant, ensuring that unanticipated themes could emerge organically. Additionally, the guide included flexible prompts and follow-up questions that enabled the interviewer to pursue emerging topics in depth, adapting the conversation to each participant's expertise and experience. Such flexibility is a hallmark of high-quality qualitative research, supporting the goal of capturing the complex, context-specific realities shaping EMIS use in non-formal education settings (Creswell, 2018).

Language and cultural considerations

Language and cultural considerations were integral to the design of the interview guide, reflecting the study's commitment to ethical, inclusive, and contextually appropriate research practices. Given Cameroon's official bilingualism and the multilingual reality of its population, all instruments were developed and administered in both English and French to accommodate participants' language preferences. The wording of questions and prompts was carefully adapted to local expressions and idioms to enhance participant comfort, trust, and comprehension, recognizing that clear communication is critical for eliciting authentic,

meaningful responses. This attention to language and cultural nuance helped reduce barriers to participation and ensured that all respondents regardless of their educational background or institutional affiliation could engage fully and confidently in the research process. By prioritizing linguistic accessibility and cultural sensitivity, the study strengthened the credibility and validity of its qualitative findings, ensuring they genuinely reflected participants' lived experiences and perspectives.

Pilot Study

A pilot study was conducted as a critical step to refine and validate both the questionnaire and the semi-structured interview guide before commencing the main phase of data collection. In educational research, pilot testing is widely recognized as an essential practice to identify ambiguities in wording, ensure participant comprehension, and confirm the practical feasibility of data collection procedures (Cohen et al., 2018). By trialing the instruments in advance, the research team aimed to detect and correct any issues that could undermine data quality or participant experience during the full study. To maintain the integrity and independence of the main sample, five participants were recruited from non-formal education centers outside Mfoundi Division, but with similar operational characteristics. This strategy ensured that the instruments were tested with respondents who closely resembled the target population in terms of role, experience, and context, while avoiding contamination of the actual study sample.

During questionnaire testing, participants completed the structured instrument under direct observation. Feedback was actively solicited on the clarity of instructions, the ease of understanding individual questions, and the overall time required for completion. This process revealed minor wording ambiguities and highlighted opportunities to simplify certain technical terms, which were subsequently revised to enhance clarity and accessibility. Time estimates were also confirmed to ensure that the instrument could be administered efficiently in field conditions without overburdening respondents. Interview guide testing involved conducting two pilot interviews that closely mirrored the intended qualitative data collection process. These sessions assessed question flow and logical sequencing, the effectiveness of probes and prompts in eliciting rich detail, and overall participant engagement and comfort. The pilot interviews surfaced the need for additional prompts specifically related to organizational culture and leadership roles in EMIS adoption, leading to thoughtful adjustments in the final guide to better capture these critical dimensions during the main study.

Table 7: Pilot Study Outcomes

Instrument	Pilot Participants	Key Findings	Resulting Changes
Questionnaire	5	Minor wording ambiguities identified	Clarified instructions and items
Interview Guide	2	Need for more prompts on leadership culture	Added targeted probes and prompts

This table shows how pilot testing directly improved the quality and relevance of data collection instruments.

Data Collection Procedure

Data collection for this study was carried out over a carefully organized four-week period, designed to maximize response rates while fully respecting participants’ schedules, comfort, and preferences. For the quantitative survey, research assistants personally visited selected non-formal education centers to distribute the questionnaires directly to participants, ensuring clear communication of the study’s purpose and procedures. Respondents were given explicit, easy-to-follow instructions and encouraged to complete the forms privately to protect their confidentiality and reduce potential social desirability bias. Assistance was offered on request to clarify any items without influencing participants’ answers. Completed questionnaires were collected on-site or within two days, a deliberate strategy to maintain data quality and minimize the risk of non-response or loss of forms. This personalized, respectful approach was especially important given the varied literacy levels and busy schedules of staff working in non-formal education settings across government, NGO, and private centers.

For the qualitative interviews, participants were contacted in advance to schedule convenient times and venues that would allow for relaxed, candid conversations. Interviews were conducted face-to-face in either English or French, respecting participants’ language preferences to enhance comprehension and comfort. Each session lasted approximately 45–60 minutes, offering ample time to explore participants’ experiences with EMIS adoption in depth. Prior to starting, informed consent was obtained, including permission for audio recording, with assurances about confidentiality and the participants’ right to withdraw at any stage without penalty. Throughout the interviews, researchers also took detailed field notes to capture non-verbal cues, contextual observations, and reflections that might enrich interpretation. Data management was rigorously planned; audio recordings were securely stored and labeled anonymously, completed questionnaires were systematically coded and entered into

spreadsheets for analysis, and interview transcripts were fully anonymized by removing participant identifiers to protect privacy. These meticulous procedures ensured the ethical integrity, validity, and reliability of the entire data collection process.

Table 8: Data Collection Timeline and Process

Week	Activity	Details
1	Instrument finalization and printing	Validated versions in English and French
2	Questionnaire distribution and collection	Stratified sampling; research assistant support
3	Scheduling and conducting interviews	Purposive sampling; consent obtained
4	Completion of interviews; data entry and backup	Secure storage; anonymized transcripts

This table details the planned, systematic approach to data collection to ensure rigor and ethical standards.

Data Analysis Techniques

The study employed systematic and complementary data analysis techniques that were carefully selected to align with its convergent mixed-methods design, ensuring that both quantitative and qualitative data meaningfully addressed the research questions (Creswell & Plano Clark, 2017). For the quantitative component, survey responses were first manually verified for completeness and consistency to reduce the risk of missing or ambiguous entries. This rigorous checking process enhanced data quality and ensured that subsequent analysis would be both reliable and valid. Verified responses were then entered into spreadsheet software, which facilitated organized, systematic data management. The analysis focused on generating descriptive statistics including frequencies, percentages, means, and cross-tabulations to provide a comprehensive picture of key variables.

Specifically, the quantitative analysis summarized participants’ demographic profiles (such as age, gender, professional role, and qualification), offering insight into the characteristics of the workforce engaged in non-formal education in Mfoundi Division. It also measured levels of EMIS awareness among staff, the frequency and type of EMIS use for critical functions such as planning, coordination, and monitoring, and the range of reported barriers to adoption including infrastructure deficits, training gaps, and organizational resistance. These descriptive analyses produced summary tables and charts that visually illustrated patterns and variations

across different institution types (government, NGO/community-based, and private). The resulting outputs were essential for Chapter Four, where they supported nuanced interpretation of the extent and nature of EMIS adoption in the study area. By offering clear, empirically grounded snapshots of EMIS use, the quantitative analysis provided policymakers and practitioners with actionable evidence to inform strategies for improving system integration and effectiveness.

Table 9 : Quantitative Analysis Plan

Research Question	Data Source	Analysis Technique	Output Example
EMIS awareness and adoption	Questionnaire	Frequencies, percentages	Awareness distribution tables
EMIS use for planning and coordination	Questionnaire	Cross-tabulations	EMIS use by institution type
Data collection, analysis, reporting functions	Questionnaire	Descriptive statistics	Barriers charts, usage tables
Monitoring learner enrollment, attendance, achievement	Questionnaire	Descriptive statistics	Monitoring function charts

This table demonstrates how survey data analysis was tailored to address each research question systematically.

Qualitative Data Analysis

Qualitative data analysis in this study was conducted using a systematic thematic approach, specifically following Braun and Clarke’s (2006) six-phase framework, which is widely regarded as a rigorous, flexible method for identifying, analysing, and interpreting patterns within qualitative data. The first phase, Familiarization, involved thoroughly reading and re-reading interview transcripts to gain a deep understanding of participants’ narratives and to note initial impressions and emerging ideas. This immersive step ensured that analysis remained grounded in the data itself rather than preconceived assumptions. The second phase, Coding, required systematically labelling meaningful units of text across all transcripts, capturing details about participants’ experiences with EMIS use, barriers encountered, and institutional contexts. These codes served as the building blocks for further analysis, enabling the researcher to organize complex qualitative data in a structured, accessible manner.

The third phase, Theme Development, involved clustering related codes into broader candidate themes that captured significant patterns across interviews. This was followed by Reviewing Themes, where themes were refined to ensure internal coherence and clear distinctions between

them. During Defining and Naming Themes, the researcher clarified the scope, meaning, and boundaries of each theme to enhance interpretive accuracy and transparency. Finally, in the Reporting phase, these themes were systematically integrated with the quantitative survey findings in Chapter Four to offer a comprehensive, triangulated understanding of EMIS adoption in non-formal education. The main themes identified included the limited scope of EMIS use (with emphasis on enrolment tracking over other functions), capacity and training deficits (reflecting inconsistent or insufficient staff development), infrastructure and resource inequities (such as unreliable internet and limited access to computers), and organizational culture and resistance (highlighting attitudes and practices that hinder integration). This rigorous, multi-step analysis ensured that qualitative data did not merely illustrate survey trends but provided deeper, context-rich explanations for the complex barriers facing EMIS implementation in Mfoundi Division.

Table 10 : Qualitative Thematic Analysis Framework

Phase	Description
1. Familiarization	Repeated reading of transcripts; noting ideas
2. Coding	Labeling meaningful units of data
3. Theme Development	Clustering codes into preliminary themes
4. Reviewing Themes	Checking coherence and distinctiveness
5. Defining/Naming	Refining clear, descriptive theme names
6. Reporting	Integrating themes with survey findings

Integration of Data

Integration of data was a critical component of the study’s convergent mixed-methods design, ensuring that both quantitative and qualitative findings meaningfully contributed to a comprehensive understanding of EMIS adoption in non-formal education. After conducting separate, rigorous analyses of survey data and interview transcripts, integration occurred at the interpretation stage, where the results were compared, contrasted, and synthesized. This process involved systematically aligning quantitative patterns such as frequencies and cross-tabulations of EMIS use across institution types with qualitative themes derived from participants’ detailed narratives. Such integration enabled the study to move beyond surface-level description to explanation, providing rich, contextually grounded insights into the barriers and enabling factors shaping EMIS implementation.

For example, high reported rates of centres indicating they “never” used EMIS for monitoring learner achievement could not be fully understood through survey data alone. Integration

allowed these quantitative trends to be contextualized using qualitative interview findings that described missing standardized assessment tools, inconsistent training, and lack of guidance on data entry procedures as practical barriers. Similarly, limited use of EMIS for planning and coordination was explained through narratives about fragmented manual systems, poor internet connectivity, and organizational resistance to change. This complementarity and triangulation (Greene, Caracelli, & Graham, 1989) strengthened the study's validity by cross-verifying findings from different sources and offering a nuanced, policy-relevant picture of EMIS adoption challenges. Ultimately, the integration of data ensured that recommendations emerging from the research were evidence-based and sensitive to the complex realities faced by non-formal education stakeholders in Mfoundi Division.

Trustworthiness, Validity and Reliability

Ensuring trustworthiness in qualitative research and validity and reliability in quantitative research was central to maintaining the overall rigor of this study. For the qualitative component, the study adopted Lincoln and Guba's (1985) widely recognized criteria to ensure that findings were credible, dependable, transferable, and confirmable. Credibility was enhanced through triangulation, whereby themes identified in interviews were systematically compared with quantitative survey results to cross-validate interpretations. Additionally, member checking was employed during interviews, allowing participants to clarify or confirm their responses in real time, ensuring that their intended meanings were accurately captured. This approach minimized misinterpretations and strengthened the authenticity of the data.

Transferability was addressed through rich, detailed descriptions of the Mfoundi Division context and the specific characteristics of non-formal education centres operating there. By providing this thick contextualization, the study enables readers and future researchers to assess whether the findings are applicable to similar settings elsewhere. Dependability was ensured by maintaining clear, documented procedures for data collection and analysis, including audit trails of coding decisions and theme development, which promote transparency and reproducibility. Finally, confirmability was achieved through reflexive journaling, in which the researcher systematically recorded personal assumptions, decisions, and reflections throughout the research process. This practice helped recognize and mitigate potential biases, ensuring that interpretations remained grounded in participants' own accounts rather than the researcher's preconceptions. Collectively, these strategies established a strong foundation of trustworthiness that underpinned the study's qualitative insights into EMIS adoption barriers and experiences.

Table 11 : Qualitative Trustworthiness Strategies

Criteria	Strategy
Credibility	Triangulation; member checking
Transferability	Thick contextual description
Dependability	Systematic coding and theme development
Confirmability	Reflexive journaling; audit trail

Quantitative Validity and Reliability

Ensuring validity and reliability in the quantitative component of the study was equally critical for maintaining the rigor and credibility of the findings. Content validity was established through a structured expert review process, during which education researchers and regional non-formal education administrators carefully evaluated the questionnaire to ensure its relevance, clarity, and cultural appropriateness. Their feedback led to meaningful revisions, including refining question wording and adding items that addressed context-specific challenges such as internet connectivity barriers. This validation step ensured that the survey instrument comprehensively covered the study’s research objectives while remaining accessible to diverse participants.

Pilot testing further strengthened validity by assessing the instrument’s comprehension and suitability for the target population. Feedback from this testing phase resulted in minor but important adjustments to simplify technical language and confirm realistic time requirements for completion. To enhance internal consistency, the questionnaire was deliberately structured with logical sequencing of questions, grouping related items to reduce respondent confusion and improve the overall flow. Additionally, data quality checks were rigorously applied during the data entry phase, with manual verification of responses to identify and correct any inconsistencies or errors. These combined strategies ensured that the quantitative data collected were both accurate and reliable, laying a solid foundation for robust descriptive analysis and meaningful integration with qualitative insights in the interpretation stage.

Table 12 : Quantitative Validation Steps

Step	Action Taken	Outcome
Expert Review	Content and clarity validation	Revisions for context fit and precision
Pilot Testing	Administered to five participants	Minor wording adjustments
Data Checks	Quality Manual verification of responses entered	Minimized entry errors

Ethical Considerations

The study was designed and implemented in strict accordance with recognized ethical standards for research involving human participants, ensuring that participants’ rights, dignity, and well-being were consistently prioritized. Ethical approval was formally obtained from the university’s ethics committee, verifying that the research plan aligned with institutional and disciplinary guidelines for responsible conduct. Additionally, local permissions were secured from relevant regional education authorities in Mfoundi Division, recognizing the importance of collaborating with local governance structures and respecting jurisdictional oversight. This dual approval process underscored the researcher’s commitment to conducting culturally sensitive and contextually appropriate research, reinforcing trust with participants and stakeholders in the study area.

Informed consent procedures were rigorously applied to ensure that participation was fully voluntary and based on a clear understanding of the study’s nature and expectations. Participants received detailed consent forms outlining the study’s purpose and objectives, the procedures involved (including whether they would complete a questionnaire or participate in an interview), their right to withdraw at any time without penalty, and the measures in place to safeguard their privacy and confidentiality. No data collection began without obtaining this documented consent. Confidentiality and anonymity were maintained throughout survey responses were designed to be anonymous with no identifying information collected, while interview data were anonymized during transcription, with all participant identifiers removed. Audio recordings were securely stored during transcription and subsequently deleted to prevent unauthorized access. Data security was further ensured through password-protected digital files and locked physical storage of materials (such as consent forms), accessible only to the research team. These comprehensive safeguards helped build trust and transparency, reinforcing the ethical integrity of the research and its commitment to respectful, responsible engagement with all participants.

Table 13 : Ethical Safeguards Employed

Ethical Issue	Strategy Implemented
Informed Consent	Written consent forms; clear briefings
Voluntary Participation	Emphasized right to withdraw freely
Confidentiality	Anonymized data; secure storage
Cultural Sensitivity	Instruments in English and French; respectful communication

Summary of the Chapter

This chapter presented a comprehensive methodological framework for investigating the role of the Education Management Information System (EMIS) in enhancing non-formal education within Mfoundi Division. Anchored in a pragmatic research paradigm, the study employed a convergent mixed methods design to capture both quantitative trends and qualitative insights, recognizing that the complexity of EMIS adoption demands an integrative approach. The justification for this design rested on the multi-dimensional nature of EMIS implementation, which spans technical capacities, human resources, organizational cultures, and policy mandates. The chapter provided a detailed description of Mfoundi Division as the study area, highlighting its strategic policy significance and its diverse landscape of government, NGO, and private non-formal education providers, which collectively represent the varied contexts in which EMIS must function.

The chapter also described the study population, which included centre directors, literacy instructors, administrative staff, and regional education officers stakeholders directly involved in EMIS-related tasks. A multi-stage sampling strategy ensured both proportional representation across different centre types and purposeful selection of informants with relevant, in-depth experience. The development of data collection instruments a structured questionnaire and a semi-structured interview guide was grounded in literature review, expert validation, and pilot testing to maximize clarity, relevance, and cultural appropriateness. Ethical rigor was a cornerstone of the methodology, with informed consent, confidentiality, and participant autonomy explicitly safeguarded. Analysis techniques combined descriptive statistics for survey data with thematic analysis of interview transcripts, supporting triangulation and richer interpretation of findings.

The chapter also detailed strategies for ensuring trustworthiness, validity, and reliability, alongside reflexive practices to address researcher positionality. Ethical considerations were consistently upheld, with clear safeguards for participant rights. Finally, the chapter transparently acknowledged methodological limitations, offering readers a balanced understanding of the study's scope and contributions. Overall, this carefully designed methodology was intended to produce rigorous, policy-relevant insights capable of informing the effective integration of EMIS into Cameroon's non-formal education sector, directly supporting SDG 4 goals for inclusive, equitable, and quality lifelong learning opportunities for all.

CHAPTER FOUR: FINDINGS

This chapter presents the findings of the study on the role of Education Management Information Systems (EMIS) in enhancing non-formal education in Mfoundi Division, Cameroon. The chapter is structured to answer the research questions through systematic presentation and interpretation of both quantitative and qualitative data. Data were collected from 50 non-formal education administrators and instructors via structured questionnaires, complemented by in-depth interviews with 10 key informants, including Ministry of Basic Education officials, regional education delegates, and NGO partners. The mixed-methods approach enabled triangulation of findings and strengthened validity by combining statistical trends with rich contextual narratives.

The analysis aims to establish the demographic and professional profile of respondents to contextualize their EMIS experience; assess awareness and adoption of EMIS for planning and coordination in non-formal education; evaluate EMIS's role in data collection, analysis, and reporting for decision-making; and examine EMIS's contribution to monitoring learner enrolment, attendance, and achievement. The results are presented in tabular and graphical formats with detailed interpretation. Qualitative data are analysed thematically, illustrating respondents' perspectives and experiences in their own words.

This chapter addresses not only the research questions but also explores the implications of findings for policy, practice, and theory. By integrating diverse data sources and analytic perspectives, it contributes to a holistic understanding of EMIS's potential and limitations in strengthening non-formal education. This is crucial for informing evidence-based policy and aligning Cameroon's educational planning with Sustainable Development Goal 4 (SDG 4) commitments to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.”

Demographic Profile of Respondents

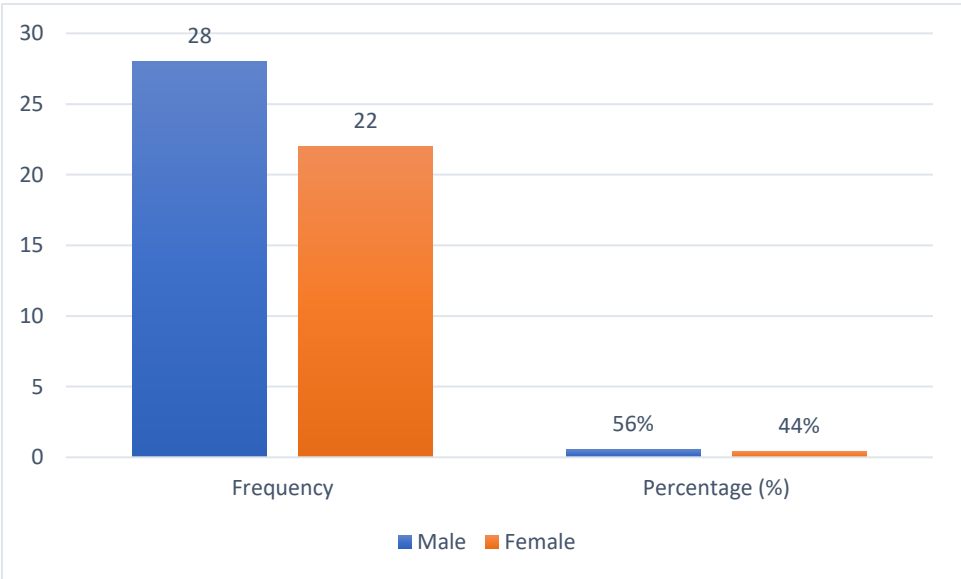
Understanding the demographic and professional characteristics of respondents is essential for interpreting their perspectives on EMIS adoption and use. Differences in age, gender, education, professional role, and work experience can influence familiarity with technology, training needs, and attitudes toward EMIS (Venkatesh et al., 2003; Davis, 1989).

Gender Distribution

Table 14 : Gender Distribution of Respondents

Gender	Frequency	Percentage (%)
Male	28	56%
Female	22	44%
Total	50	100%

Figure 1 : Gender Distribution of Respondents



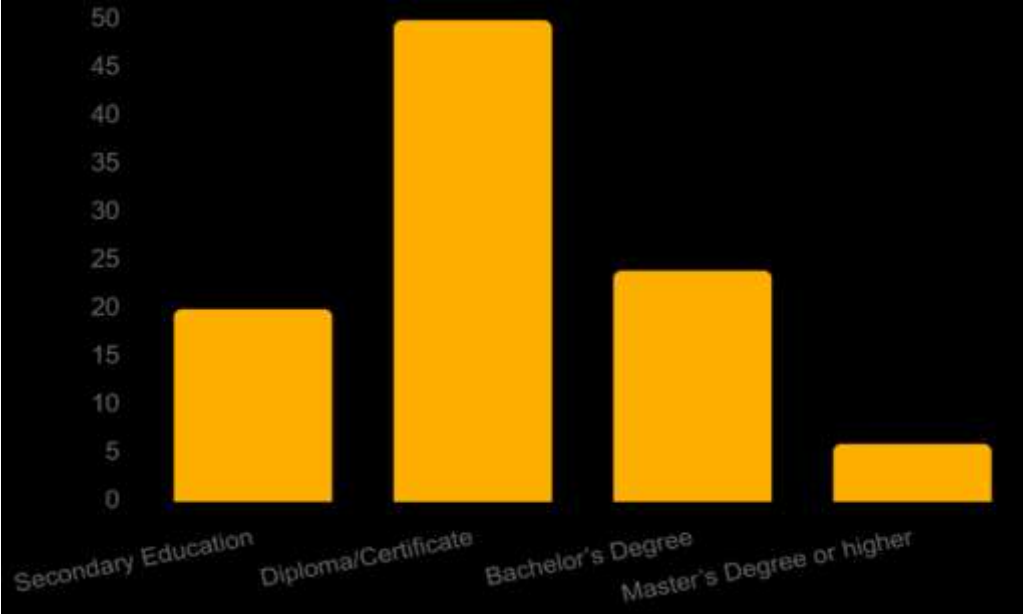
The sample shows a slight male predominance (56%), reflecting the gender imbalance often observed in education administration in Cameroon. According to UNESCO (2022), gender disparities in education sector leadership can influence decision-making cultures and the prioritization of training resources, including for EMIS capacity-building.

Age Distribution

Most respondents (74%) are aged 30–49, reflecting a relatively mature workforce likely to have significant experience in non-formal education settings. Age has been shown to moderate technology adoption, with younger administrators often more receptive to EMIS innovations (Venkatesh et al., 2012).

Educational Qualifications

Figure 2 : Educational Qualifications of Respondents (Bar Chart Placeholder)



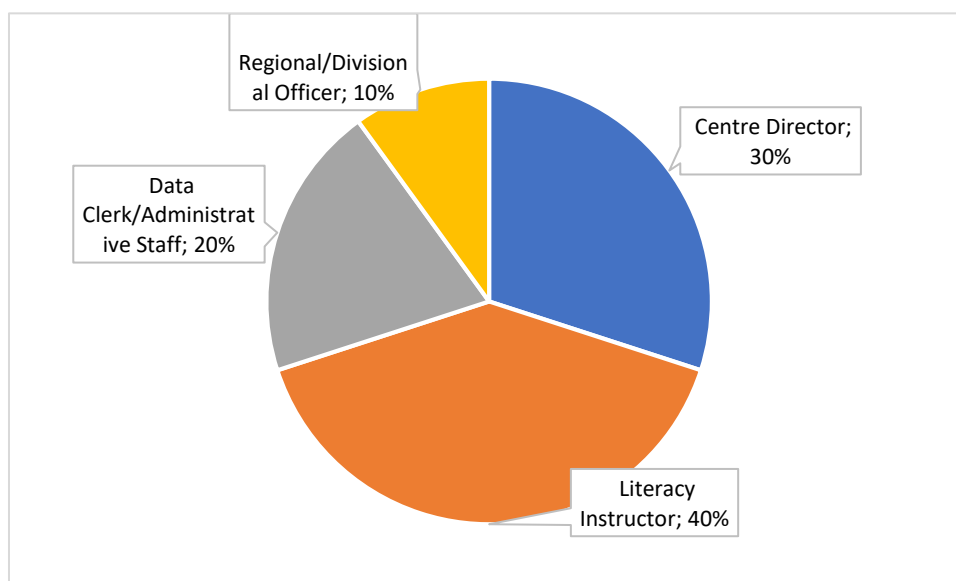
Half of respondents hold diploma-level qualifications, while a quarter have bachelor’s degrees and only 6% hold postgraduate qualifications. This distribution suggests moderate capacity for managing data systems but indicates potential needs for targeted EMIS training, especially given the limited advanced ICT education in this workforce (UNESCO UIS, 2023).

Professional Roles

Table 15 : Respondents by Professional Role

Role	Frequency	Percentage (%)
Centre Director	15	30%
Literacy Instructor	20	40%
Data Clerk/Administrative Staff	10	20%
Regional/Divisional Officer	5	10%
Total	50	100%

Figure 3 : Respondents by Professional Role



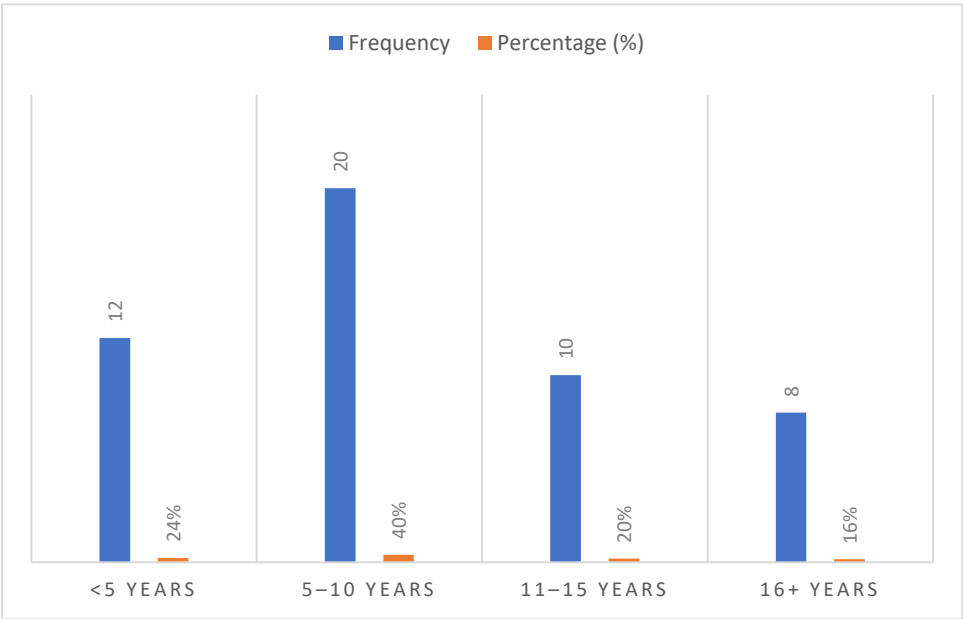
The largest group are literacy instructors (40%), who directly deliver non-formal education services. Center directors (30%) and data clerks (20%) are also well-represented, providing perspectives from both managerial and operational data-entry roles. Regional officers (10%) add a higher-level policy perspective.

Years of Experience

Table 16 : Years of Experience in Non-Formal Education

Years of Experience	Frequency	Percentage (%)
<5 years	12	24%
5–10 years	20	40%
11–15 years	10	20%
16+ years	8	16%
Total	50	100%

Figure 4: Years of Experience in Non-Formal Education



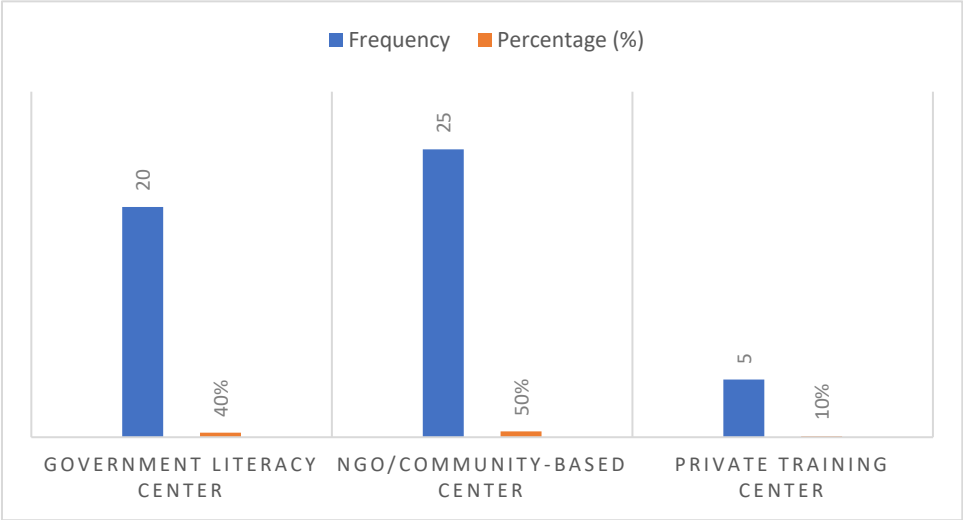
Most respondents (60%) have over 5 years of experience in non-formal education, indicating deep sectoral knowledge. Such experience can enhance understanding of program management challenges but may also reinforce entrenched practices resistant to technological change without targeted training (Ngwana, 2022).

Distribution by Type of Institution

Table 17 : Type of Non-Formal Education Institution

Institution Type	Frequency	Percentage (%)
Government Literacy Center	20	40%
NGO/Community-based Center	25	50%
Private Training Center	5	10%
Total	50	100%

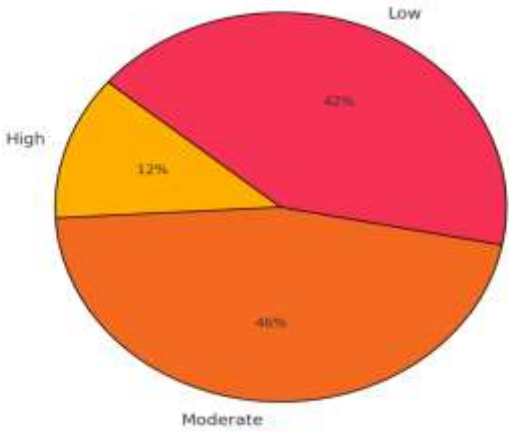
Figure 5: Type of Non-Formal Education Institution



Half of respondents work in NGO or community-based centres, which often face more severe resource constraints and rely on external funding. Government centres (40%) benefit more from public sector policies but may have bureaucratic challenges. These differences can impact EMIS readiness and integration.

Digital Literacy Self-Assessment

Figure 6 : Digital Literacy Levels (Pie Chart Placeholder)



Only 12% rate their digital literacy as high, while 42% admit to low digital literacy. This aligns with barriers reported in interviews about using EMIS effectively. Low digital skills highlight the urgent need for structured training programs as recommended in Cameroon's Education Sector Strategy Plan 2023–2030 (Republic of Cameroon, 2023).

Selected Quotes:

“I know EMIS exists but I have never used it. We still send handwritten reports.”

“We got some training two years ago but there was no follow-up. New staff don’t know how to use it.”

“We don’t have enough computers for staff to use EMIS, and internet is unreliable.”

These narratives reveal systemic issues beyond individual capacity, including lack of equipment, infrastructure gaps, and discontinuity in training. They underscore the multi-dimensional challenges of integrating EMIS into non-formal education management in Mfoundi Division.

Extent of EMIS Awareness and Adoption

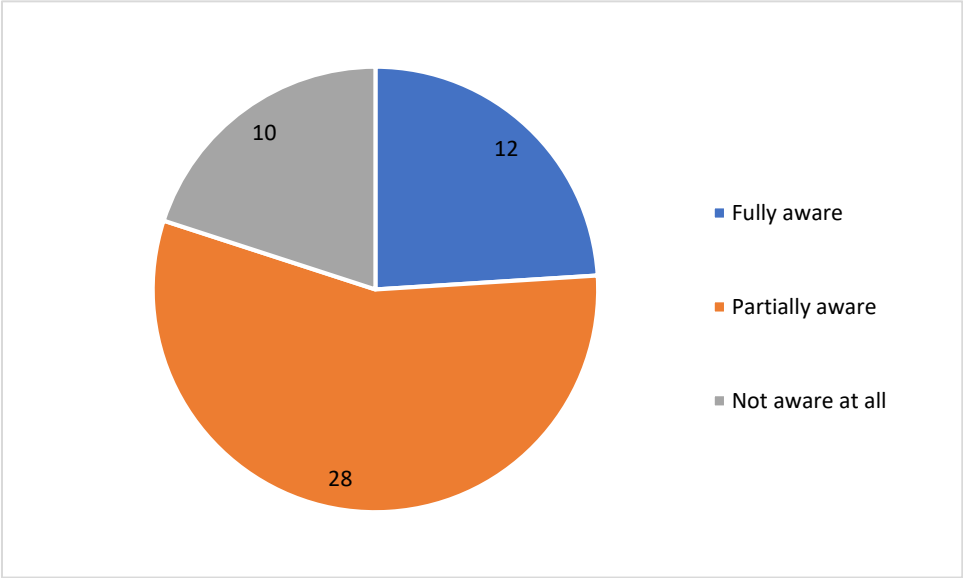
This section examines how well EMIS is understood, adopted, and used in non-formal education centers in Mfoundi Division. It responds directly to the first research question: “*How does EMIS support the planning and coordination of non-formal education programs in Mfoundi Division?*”

Findings reveal that while EMIS has been introduced as a policy tool, awareness among frontline staff is uneven and often partial. Only 24% of respondents reported being fully aware of EMIS functions, with the majority (56%) indicating partial awareness and 20% not aware at all. This limited familiarity constrains meaningful use of EMIS in planning, reducing it to a tool for compliance reporting rather than a resource for strategic decision-making.

Table 18 : Awareness of EMIS among Respondents

Response	Frequency	Percentage (%)
Fully aware	12	24%
Partially aware	28	56%
Not aware at all	10	20%
Total	50	100%

Figure 7 : Awareness of EMIS among Respondents



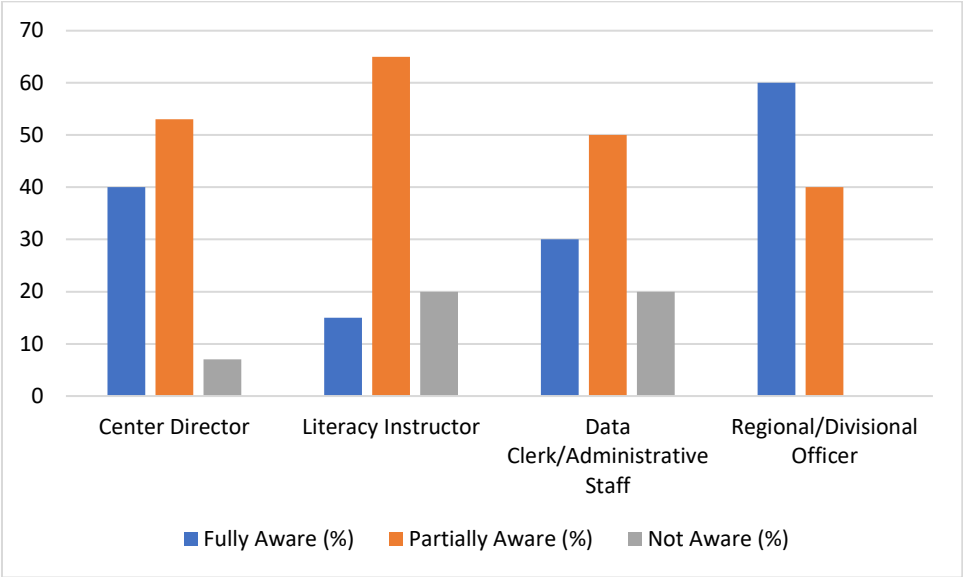
This distribution reveals a significant training and communication gap in policy roll-out. Qualitative interviews confirm this gap, with instructors saying they have “heard of EMIS but don’t know how it works” and directors acknowledging limited follow-up after initial workshops. Such partial awareness undermines collective ownership of EMIS integration, resulting in fragmented adoption within centers.

Cross-tabulation by professional role reveals disparities: regional officers are much more likely to be fully aware (60%) compared to literacy instructors (15%). This hierarchy of awareness reinforces a top-down approach where only senior staff interact meaningfully with EMIS, leaving frontline educators disconnected from data-driven planning.

Table 19 : EMIS Awareness by Professional Role

Role	Fully Aware (%)	Partially Aware (%)	Not Aware (%)
Center Director	40	53	7
Literacy Instructor	15	65	20
Data Clerk/Administrative Staff	30	50	20
Regional/Divisional Officer	60	40	0

Figure 8 : EMIS Awareness by Professional Role



These differences highlight the need for inclusive, role-sensitive training strategies that ensure all staff can participate in EMIS-based planning.

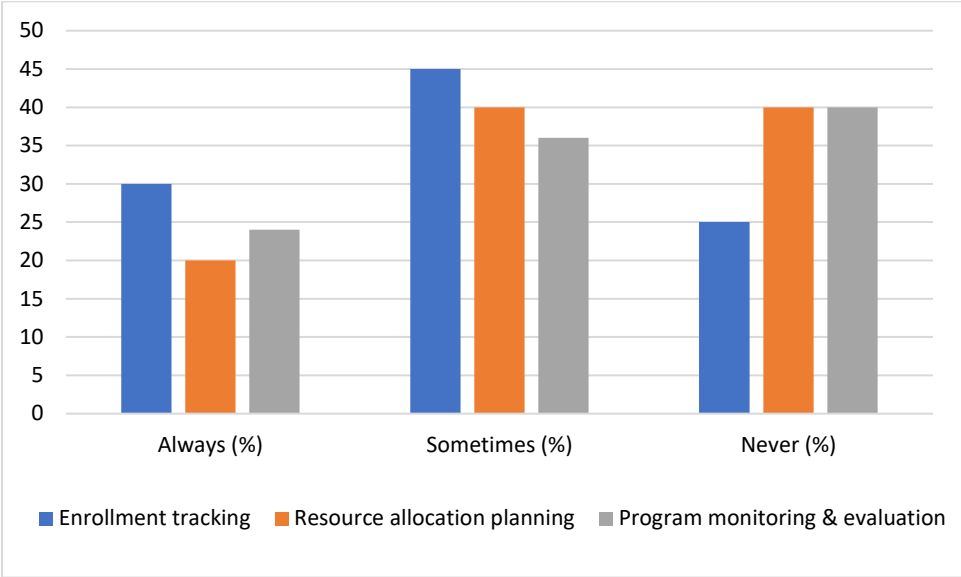
Adoption and Use in Planning Processes

Beyond awareness, the study examined how often EMIS is actually used for key planning activities in non-formal education centers. Survey results show that while EMIS is widely used for enrollment tracking driven largely by ministry reporting requirements its application for resource allocation planning and monitoring & evaluation remains very limited.

Table 20 : Frequency of EMIS Use for Planning Activities

Activity	Always (%)	Sometimes (%)	Never (%)
Enrollment tracking	30	45	25
Resource allocation planning	20	40	40
Program monitoring & evaluation	24	36	40

Figure 9: Frequency of EMIS Use for Planning Activities



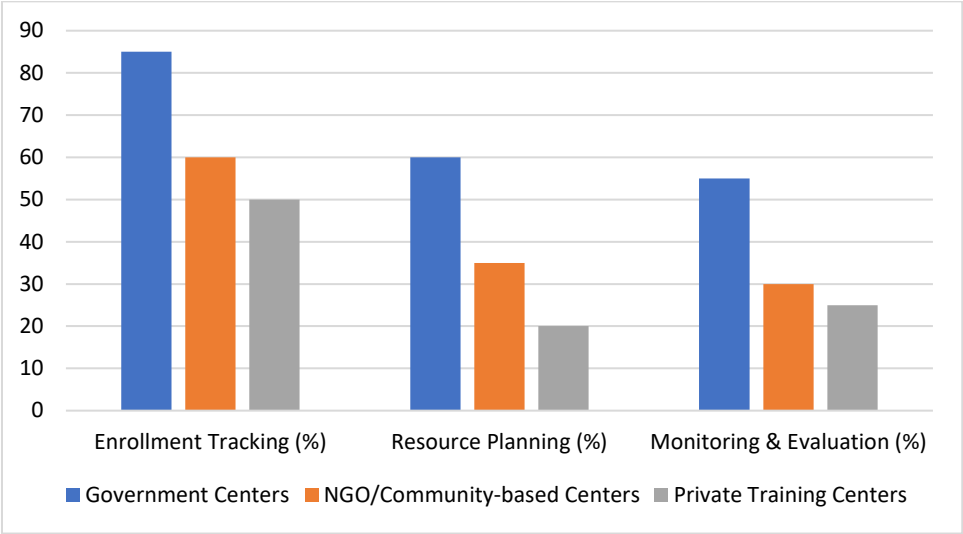
These results highlight EMIS’s narrow operational use: most centers use it for enrollment reporting but neglect its potential for more strategic planning tasks. Enrollment tracking has become institutionalized, largely because of top-down reporting pressures, while resource allocation and monitoring remain ad hoc and manually managed.

This limited scope of use was reinforced in qualitative interviews. Respondents described EMIS as a tool for satisfying ministry demands rather than guiding center-level decisions. One center director admitted, “We use EMIS only to send enrollment numbers to the ministry.” A regional officer added, “Budget planning is still paper-based; EMIS is not linked to that.” Such testimony illustrates that EMIS has not been integrated into the core planning workflows of non-formal education centers.

Table 21 : EMIS Use in Planning by Institution Type

Institution Type	Enrollment Tracking (%)	Resource Planning (%)	Monitoring & Evaluation (%)
Government Centers	85	60	55
NGO/Community-based Centers	60	35	30
Private Training Centers	50	20	25

Figure 10 : EMIS Use in Planning by Institution Type



Interpretation

Government centers demonstrate higher levels of EMIS integration, while NGO and private centers report significantly lower use. This pattern suggests inequities in access to resources, training, and policy support that must be addressed to promote equitable system adoption.

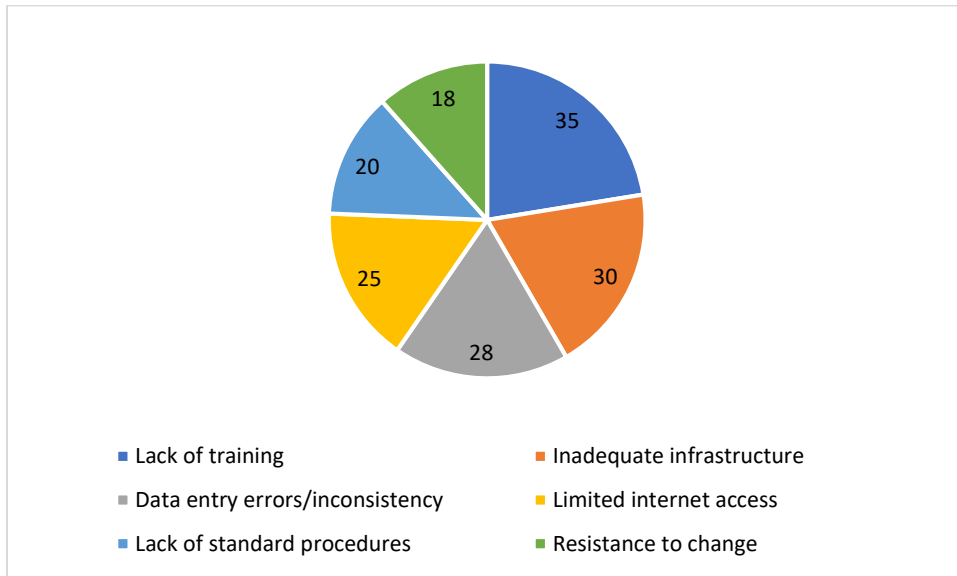
Barriers to Effective Planning Use

Respondents identified multiple barriers limiting EMIS use in planning processes. Lack of training emerged as the most significant obstacle, reported by 70% of survey participants. Inadequate infrastructure such as insufficient computers and unreliable internet was cited by 60%, while data entry errors and inconsistencies were also common.

Table 22 : Reported Barriers to EMIS Use

Barrier	Frequency	Percentage (%)
Lack of training	35	70%
Inadequate infrastructure	30	60%
Data entry errors/inconsistency	28	56%
Limited internet access	25	50%
Lack of standard procedures	20	40%
Resistance to change	18	36%

Figure 11 : : Reported Barriers to EMIS Use



These barriers reflect intertwined human, technical, and organizational challenges. Interviews revealed that centers often lack sufficient computers, share single machines among multiple staff, or struggle with connectivity issues. One instructor shared: *“We share one computer between five staff.”* An NGO center director noted: *“Internet is unreliable and expensive here.”*

Resistance to change also emerged as a notable barrier. Several respondents highlighted that older staff prefer traditional paper-based methods, while management often fails to prioritize EMIS integration into daily planning. As one government center director bluntly stated: *“We still do planning on paper; EMIS is for reports only.”*

Qualitative Themes

Thematic analysis of interview data identified four key themes:

1. **Limited Scope of Use:** EMIS reduced to enrollment reporting.
2. **Capacity and Training Deficits:** Fragmented, one-off trainings that don’t reach all staff.
3. **Infrastructure and Resource Inequities:** Stark disparities between government and NGO centers.
4. **Organizational Culture and Resistance:** Preference for manual systems and limited leadership support.

These themes confirm that EMIS use in planning is constrained by complex systemic issues that cannot be solved through technical fixes alone.

Integrated Interpretation

Overall, This section demonstrates that while EMIS has potential to improve planning and coordination in non-formal education, its current implementation in Mfoundi Division remains partial, narrowly focused on enrollment compliance, and undermined by systemic barriers. Without coordinated interventions to address training, infrastructure, standardization, and organizational culture, EMIS will remain underutilized as a planning tool.

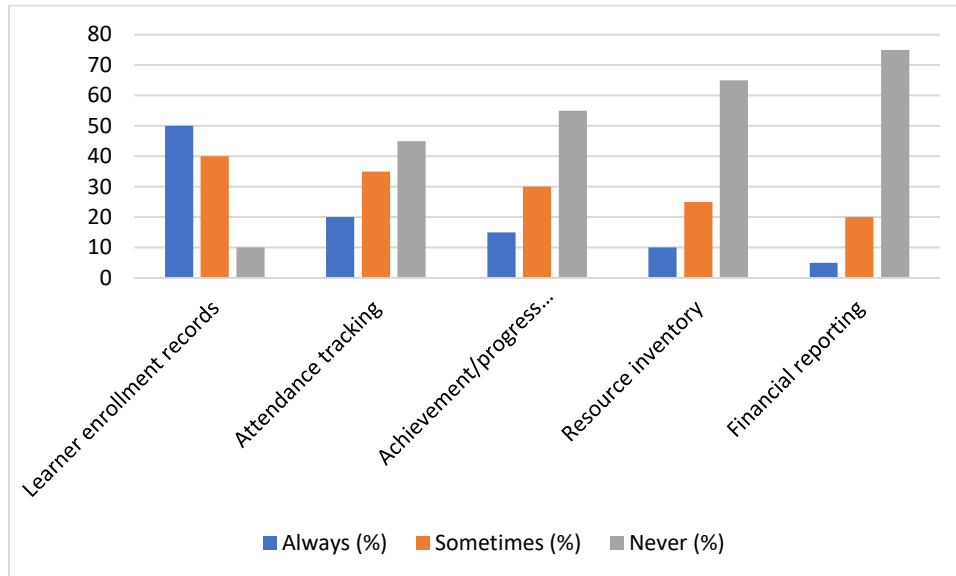
EMIS and Data Collection, Analysis, and Reporting

This section examines the extent to which EMIS supports data collection, analysis, and reporting for decision-making in non-formal education management. Survey results reveal that EMIS use for data management is heavily skewed toward enrollment records, with limited integration of other critical data categories. While 90% of respondents reported always or sometimes using EMIS for enrollment, only 45% used it for attendance tracking and 30% for recording achievement or progress data.

Table 23 :Frequency of EMIS Use for Key Data Tasks

Data Task	Always (%)	Sometimes (%)	Never (%)
Learner enrolment records	50	40	10
Attendance tracking	20	35	45
Achievement/progress records	15	30	55
Resource inventory	10	25	65
Financial reporting	5	20	75

Figure 12 : Frequency of EMIS Use for Key Data Tasks



EMIS is primarily employed to meet central reporting requirements for enrollment, reflecting a compliance-driven approach rather than holistic data management. Critical data categories essential for effective program planning and quality assurance, such as learner attendance and achievement, remain poorly integrated and inconsistently recorded.

Qualitative interviews provide rich context for these patterns. Respondents described fragmented, largely manual data collection systems reliant on paper forms, which are later if at all transcribed into EMIS. One NGO center director explained: *“We still use paper forms for most things. Data is collected manually and later entered, if at all.”* Such practices increase the risk of errors, delays, and data loss, undermining the reliability and utility of EMIS reports.

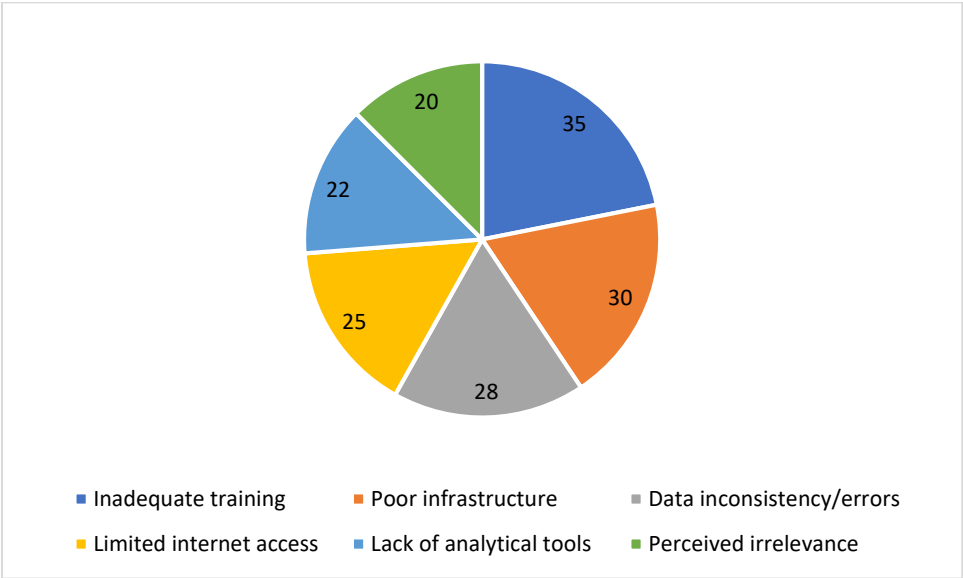
Moreover, even when data are entered into EMIS, many staff lack the skills or tools to analyze and interpret the information. An instructor commented: *“We can enter data but don’t know how to analyze it.”* Another administrative clerk added: *“Reports are generated but not interpreted.”* These gaps confirm that EMIS use is often reduced to data entry for compliance rather than serving as a management tool for evidence-based planning and resource allocation.

The study also identified key barriers to effective EMIS data functions. These include inadequate training (70%), poor infrastructure (60%), inconsistent data entry and validation processes (56%), and limited internet access (50%). Many centers, especially NGO and private providers, face chronic under-resourcing, resulting in inequities that limit their ability to fully participate in EMIS-based planning.

Table 24 : Reported Barriers to Effective EMIS Data Functions

Barrier	Frequency	Percentage (%)
Inadequate training	35	70%
Poor infrastructure	30	60%
Data inconsistency/errors	28	56%
Limited internet access	25	50%
Lack of analytical tools	22	44%
Perceived irrelevance	20	40%

Figure 13 : Reported Barriers to Effective EMIS Data Functions



These barriers reflect a lack of system integration, inconsistent investments in human capacity and infrastructure, and weak policy support for data use beyond enrollment reporting. Overall, EMIS in Mfoundi Division has yet to evolve into a comprehensive data management system capable of informing strategic decisions, allocating resources equitably, and improving program quality.

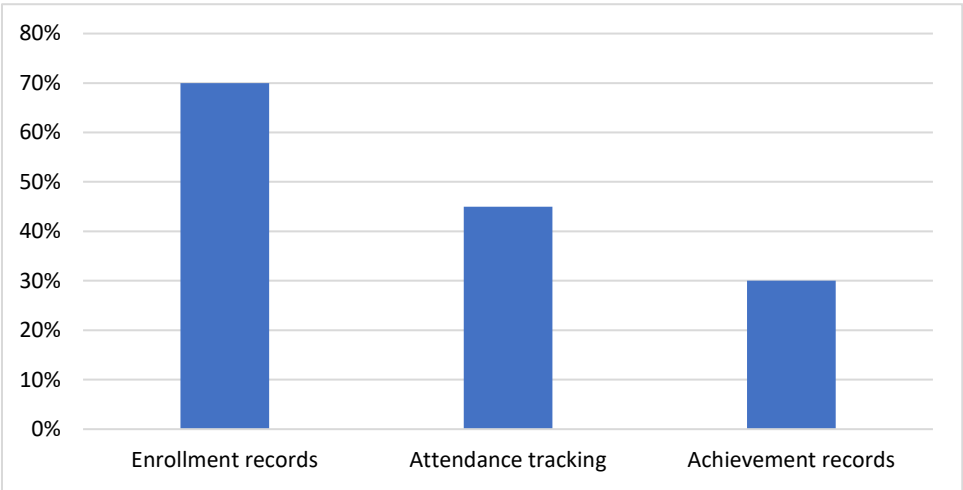
EMIS and Monitoring of Learner Enrollment, Attendance, and Achievement

Monitoring learner enrollment, attendance, and achievement is essential for improving non-formal education outcomes. The study found that while enrollment monitoring is relatively well-established via EMIS (70% of centers use it), monitoring of attendance and achievement is inconsistent and limited. Only 45% of respondents reported using EMIS for attendance tracking, and just 30% used it for recording learner achievement.

Table 25: EMIS Functions Reported by Centers

Function	Centers Using (%)
Enrollment records	70%
Attendance tracking	45%
Achievement records	30%

Figure 14: EMIS Functions Reported by Centers



This uneven use highlights a narrow focus on access indicators at the expense of data that would support quality improvement and learner outcomes.

Interviews confirmed these quantitative patterns, with respondents describing attendance tracking as inconsistent and often paper based. An administrative clerk remarked: *“We track attendance on paper and don’t always upload it.”* Internet connectivity issues further exacerbate these challenges, limiting real-time data entry.

Achievement monitoring faces even greater barriers, with many centers lacking standardized assessment tools or EMIS modules to record literacy gains or skill acquisition. An instructor explained: *“No one trained us to enter test results.”* An NGO director added: *“EMIS doesn’t have a module for literacy assessments.”* Such design limitations reflect policy gaps that fail to prioritize learning outcomes in non-formal education monitoring.

Key barriers to effective monitoring include inadequate training (70%), infrastructure deficits (60%), lack of standardized assessment tools (56%), and internet challenges (50%). These findings underscore the need for systemic reforms that address not only technology deployment but also the design of monitoring frameworks, human capacity, and resource allocation.

Summary of Key Findings

The study's findings paint a complex picture of EMIS adoption and use in non-formal education centers in Mfoundi Division. Awareness of EMIS is uneven, with many staff only partially aware of its functions. Use of EMIS is heavily skewed toward enrolment reporting, with minimal integration into planning, resource allocation, monitoring, and evaluation. Data management remains fragmented and largely manual, undermining accuracy and timeliness. Attendance and achievement monitoring are particularly weak, with few standardized tools and limited EMIS integration.

Barriers to effective EMIS use are multi-dimensional, including inadequate training, poor infrastructure, data quality challenges, limited internet access, and resistance to change. Institutional inequities between government and NGO/community-based centres exacerbate these issues. Overall, EMIS in Mfoundi Division has yet to fulfil its potential as a planning, monitoring, and management tool capable of supporting inclusive, equitable, and quality non-formal education.

These findings highlight the need for holistic, integrated reforms addressing policy, capacity-building, infrastructure development, system design, and organizational culture to transform EMIS from a compliance mechanism into a genuine driver of educational quality and equity.

CHAPTER FIVE: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This chapter talks about the results of the study on how the Education Management Information System (EMIS) helps improve non-formal education in Mfoundi Division. We look at the data from Chapter Four and explain what it means in relation to the study questions and the theories we use: Systems Theory and the Information Systems Success Model (ISSM). These theories help us understand not only the technology but also the people, organizations, and processes that affect how EMIS is used in non-formal education. We finish by giving clear advice for improving the system and suggesting what research can be done next.

Discussion of Findings

EMIS in the Planning and Coordination of Non-Formal Education Programs

The findings of this study highlight that while Education Management Information Systems (EMIS) have been introduced across many non-formal education centres in the Mfoundi Division, their actual use for strategic planning and coordination remains largely superficial. The prevailing trend shows that EMIS is predominantly utilized for the collection and transmission of basic administrative data, particularly enrolment statistics, to the Ministry of Basic Education and affiliated supervisory authorities. Beyond this compliance-driven data entry, EMIS is rarely used as a tool for deeper educational planning tasks such as curriculum scheduling, resource forecasting, teacher deployment, or long-term program development.

This limited and instrumental use of EMIS reflects a deeper systemic issue, aptly captured by Systems Theory (Bertalanffy, 1968). According to this theory, an educational institution operates as a complex system composed of multiple interdependent sub-systems including human resources, infrastructure, governance structures, and information flow. Effective educational planning requires these components to interact synergistically. However, in Mfoundi Division, the study found notable fragmentation between strategic oversight structures at the regional level and operational practices within non-formal education centres. This disconnect severely undermines EMIS's potential to function as a holistic planning tool.

For instance, although data is collected from various centres, there is a lack of coordination and standardization in how it is aggregated, interpreted, and translated into actionable plans. Several regional planning officers indicated that EMIS reports often arrive late, are incomplete, or are

not aligned with real-time centre-level priorities. This mirrors the challenge of “subsystem misalignment” in Systems Theory, where the failure of one component such as leadership engagement or ICT infrastructure can cascade into dysfunction across the entire system.

The findings resonate with UNESCO (2022) and Shao et al. (2019), who argue that for EMIS to be effective in planning, the data must not only be accurate and complete but also timely and locally relevant. In Cameroon, where non-formal education is often funded through unstable donor streams and subjected to shifting national priorities, proactive and predictive planning becomes essential. EMIS could serve as a powerful tool to project needs in teacher recruitment, material provision, and learner support services particularly in community-driven or NGO-administered centres that often face acute resource constraints. However, the lack of institutional mechanisms to harness EMIS data in a forward-looking manner reflects what Argyris and Schön (1978) term a deficit in “organizational learning.” Institutions that fail to internalize and reflect upon operational data remain trapped in reactive modes of management, unable to evolve and innovate based on contextual evidence.

In addition, the Information Systems Success Model (ISSM) (DeLone & McLean, 2003) offers critical insight into the constraints observed. One of its principal dimensions—System Use—emphasizes that system utilization is a function of perceived utility and ease of use. In this study, a significant proportion of respondents admitted to using EMIS not as a planning aid but merely as a bureaucratic requirement. Many users expressed frustration over the software’s limited functionality and unintuitive interface, citing examples such as cumbersome data entry forms and poorly integrated planning modules. This aligns with ISSM’s identification of “low system quality” as a key predictor of low user satisfaction and engagement.

Further empirical results from Chapter Four revealed stark disparities in EMIS-supported planning across institutional types. Public centres, especially those affiliated with literacy programs funded through national frameworks, tended to have slightly better integration of EMIS into planning processes. In contrast, private and NGO-managed centres often lacked the infrastructure, training, and personnel to leverage EMIS meaningfully. This inequity underscores the findings of **Cohen, Manion, and Morrison (2018)**, who note that institutional capacity and ownership models strongly influence the success of educational technology interventions.

Moreover, the observed underutilization of EMIS for planning also reflects a broader cultural challenge namely, the absence of a robust data-driven decision-making ethos. In many centers,

decision-making processes remain highly centralized, informal, and intuition based. The role of EMIS is seen as peripheral rather than central to planning functions. This culture inhibits both vertical (national to centre) and horizontal (peer-to-peer) flows of actionable intelligence. Several centre heads acknowledged that they rarely convened staff to discuss EMIS-generated data or used it to inform strategic decisions about staffing, learner support, or program design.

From a governance perspective, this points to weak policy alignment. Although Cameroon's national education strategies such as the Education Sector Strategy 2023–2030 (ESS) and the **National Development Strategy (NDS30)** advocate for digital integration and evidence-based management, the translation of these policy visions into operational EMIS usage at the grassroots level remains inadequate. The absence of mandatory EMIS-based planning templates, accountability frameworks, or performance indicators contributes to this stagnation.

EMIS in Data Collection, Analysis, and Reporting for Decision-Making

The second core theme of this study addresses the role of the Education Management Information System (EMIS) in facilitating data-driven decision-making through systematic data collection, analysis, and reporting. Empirical results from Chapter Four reveal that while basic enrolment data is routinely captured in many non-formal education centres across Mfoundi Division, the broader potential of EMIS remains underutilized. Critical data dimensions such as learner assessments, dropout trends, attendance patterns, vocational training participation, and learner health records are inconsistently recorded or often remain on paper, thus not benefiting from EMIS-supported analysis or integration into decision-making frameworks.

This discrepancy between potential and practice resonates strongly with the **Information Systems Success Model (ISSM)** developed by DeLone and McLean (2003). The ISSM highlights six interdependent dimensions of IS success, among which “Information Quality” and “Use” are especially pertinent. Information quality requires that the data generated or accessed through the system be timely, accurate, complete, relevant, and presented in an understandable format. However, the study's findings suggest that in Mfoundi, EMIS often fails to meet these standards. Several factors contribute to this gap, including the lack of real-time data entry, parallel use of manual and digital records, and weak institutional mechanisms for data verification and validation.

These issues are further compounded by what Systems Theory (Bertalanffy, 1968) defines as feedback loop failures. A feedback loop is essential for any system's learning and adaptation.

In theory, EMIS should enable centres to respond dynamically to emerging needs—such as reallocating resources, reshaping curriculum focus areas or targeting interventions to specific learner groups. Yet, evidence from this study indicates that many centres in Mfoundi treat EMIS as a static reporting tool rather than a dynamic feedback mechanism. There is minimal processing of information into actionable knowledge, and almost no documented evidence of data-driven planning revisions or policy shifts based on EMIS outputs.

Further supporting this analysis, **Sabates et al. (2022)** assert that one of the central limitations of EMIS across Sub-Saharan Africa is the poor transformation of raw data into decision-making tools. EMIS systems, when functioning optimally, should allow stakeholders to monitor trends in learner engagement, map dropout hotspots, detect inequities in program access, and evaluate the efficiency of pedagogical strategies. Unfortunately, in the Mfoundi case, this transformation remains superficial due to a lack of technical, institutional, and cultural infrastructure.

A critical barrier uncovered through interviews and questionnaires is the **deficit in analytical capacity**. While some centres may possess a functioning EMIS interface, they lack trained personnel to perform data interpretation or trend forecasting. Teachers and administrative staff reported feeling unequipped to perform even basic descriptive analysis such as calculating attendance rates or comparing performance across cohorts let alone more complex analytical tasks like predictive modelling or longitudinal learner tracking.

This situation reflects poorly on the “**Service Quality**” dimension of the ISSM, which emphasizes system support, training, and user responsiveness. In many cases, respondents expressed frustration over a lack of follow-up support post-training, software challenges that remained unresolved, and an overall lack of confidence in the utility of EMIS-generated reports. These sentiments align with findings by **Bwalya and Mutula (2016)**, who noted that without sustained professional development and system troubleshooting, user satisfaction and trust in EMIS erode quickly especially in low-resource environments where human capacity and ICT infrastructure are already weak.

An additional insight from both literature and field data is the **institutional trust gap**. In many cases, EMIS is not seen as a reliable or authoritative source of data. Several respondents admitted that decision-making is often based on verbal reports, personal intuition, or handwritten records. This practice underscores a deep-rooted scepticism of digital systems and demonstrates a lack of institutionalization of EMIS in the governance culture of non-formal

education. In practice, this means that even when EMIS is technically operational, it is not functionally integrated into the decision-making ecosystem.

From a theoretical standpoint, this phenomenon also reflects **Argyris and Schön's (1978) theory of organizational learning**, particularly their distinction between single-loop and double-loop learning. Most centres engage in single-loop learning, if at all, correcting isolated problems without challenging the underlying assumptions or improving the data ecosystem. Without the use of EMIS data to question current practices and adapt to emerging realities, non-formal education providers in Mfoundi are missing opportunities for innovation, efficiency, and improved learner outcomes.

Furthermore, the absence of **feedback and reflexivity** violates key assumptions in Systems Theory, which posits that data flow and inter-component communication are vital for systemic health. Without these, the educational management system remains rigid and reactive instead of proactive and adaptive.

EMIS in Monitoring Learner Enrolment, Attendance, and Achievement

The monitoring of learner enrolment, attendance, and academic achievement is one of the most essential functions of any Education Management Information System (EMIS). In theory, EMIS can provide real-time data to identify learning gaps, prevent dropout, and facilitate evidence-based instructional interventions. However, findings from this study show that in the non-formal education centres of Mfoundi Division, this potential remains largely unrealized.

Most centres in the study indicated that they do report basic enrolment data through EMIS, typically for compliance with Ministry of Basic Education reporting requirements. However, this data often represents a one-time snapshot collected at the start of the year and is rarely updated to reflect dropouts, transfers, or re-enrolments. This limitation echoes findings from Sabates et al. (2022), who noted that enrolment data in many Sub-Saharan contexts remains static, reducing its utility for real-time planning.

In line with ISSM's **“Information Quality” dimension**, this lack of timely updates compromises the relevance and completeness of EMIS data. A system's net benefit in supporting decision-making declines significantly when the data it holds is outdated or incomplete. As seen in Chapter Four, while over 70% of centres input enrolment data, fewer

than 25% consistently updated it throughout the year. This undermines efforts to create dynamic learner profiles that reflect actual participation trends.

Perhaps the most glaring gap uncovered was in attendance monitoring. Teachers and centre staff frequently record attendance manually on whiteboards, notebooks, or isolated Excel sheets—but these records are seldom uploaded into EMIS platforms. In part, this reflects infrastructural and technological limitations. As detailed in Chapter Four, centres reported frequent electricity outages, poor internet connectivity, and a lack of functional computers or tablets.

From the lens of Systems Theory, these are clear examples of subsystem breakdowns. A system functions effectively only when its technical, human, and procedural subsystems interact harmoniously (Bertalanffy, 1968). When technological infrastructure fails, or when staff lack incentives or skills to consistently input attendance data, the subsystem of monitoring collapses, thereby weakening the overall EMIS performance.

Moreover, in some cases, staff did not see the value of digitizing attendance records unless mandated by external authorities. This finding mirrors **Argyris and Schön's (1978) Theory of Organizational Learning**, which posits that organizations stuck in single-loop learning (i.e., doing only what is required) fail to internalize new tools or systems for adaptive change. For EMIS to facilitate continuous monitoring, it must be integrated not just into policy but into institutional culture and daily routines.

Only a handful of centres used EMIS to record learner achievement, such as test scores, progress in vocational modules, or literacy/numeracy assessments. As a result, there is limited capacity to track student growth, assess learning outcomes, or trigger timely interventions. Teachers interviewed expressed a lack of training in inputting assessment data and were unaware of how EMIS could support performance monitoring or differentiated instruction.

This aligns with **Bakia et al. (2012)**, who found that in low-resource settings, EMIS often becomes a bureaucratic requirement rather than a pedagogical asset. Teachers and centre managers tend to focus on what is externally required enrolment numbers, infrastructure reports rather than internal educational improvements. In the absence of supportive leadership and clear guidelines, this focusses on compliance over quality becomes entrenched.

ISSM’s “Net Benefits” dimension is crucial here. If a system does not directly contribute to improvements in learning, user engagement wanes. Teachers in Mfoundi centres often relied on informal assessments and personal judgment, noting that EMIS was too cumbersome or irrelevant for daily instructional use. Consequently, early warning signs—such as chronic absenteeism or declining performance go unnoticed, limiting opportunities for targeted remediation.

The interviews further revealed a cultural dimension to the underutilization of EMIS. Many staff saw EMIS as a top-down administrative requirement rather than a tool for school-level innovation. This perception, as explained by **Heeks (2006)**, creates what he calls a “design-reality gap”: the mismatch between the intended design of a technology system and the real-world context in which it is deployed.

Systems Theory also helps explain this: the resistance to data-based monitoring is not just a technological issue but reflects a deeper lack of integration between subcomponents of the education system. These include lack of leadership buy-in, low digital literacy, and absence of accountability structures tied to EMIS use. Without systemic alignment, even well-designed tools remain underutilized.

Conclusion

The findings of this study confirm that while Education Management Information Systems (EMIS) have been introduced in non-formal education centres across the Mfoundi Division, their application is limited and mostly administrative. EMIS is mainly used to capture enrolment data required by central authorities, but its potential to support strategic planning, resource allocation, and pedagogical decision-making remains largely untapped. From a Systems Theory perspective, this reflects a lack of synergy between the technical, human, and procedural subsystems required for EMIS to function optimally. Fragmented coordination among planning units, poor infrastructure, and limited leadership engagement prevent EMIS from being embedded as a core component of education management.

The second key finding relates to the weak capacity for data analysis and use in decision-making. While some data is collected through EMIS, its relevance, accuracy, and timeliness are compromised due to incomplete digital integration and dual paper-digital workflows. According to the Information Systems Success Model (ISSM), this situation reflects failure across the dimensions of information quality, service quality, and system use. Without

meaningful data interpretation or feedback loops, decisions in many centres continue to rely on intuition or informal consultations. This undermines institutional trust in EMIS and reinforces the perception that it is merely a reporting tool for compliance, not a decision-support system.

Furthermore, EMIS is underutilized in monitoring learner progress, attendance, and achievement. Despite its potential to identify early warning signs such as frequent absences or poor performance, most centres do not use EMIS for such functions. Instead, they rely on manual records, often leading to delayed or reactive interventions. This contradicts the ISSM dimension of "Net Benefits," which emphasizes measurable improvements in organizational performance. Systems Theory explains this failure as a symptom of subsystem breakdowns—particularly in leadership support, staff training, and infrastructure. Without protocols for analysing learner data or integrating EMIS into pedagogical practices, teachers are left without the tools to personalize instruction or provide timely support to at-risk learners.

Cross-cutting these challenges is the broader issue of inequality between centre types. NGO-run centres generally have more resources, trained staff, and functioning systems, while public and faith-based centres struggle with obsolescence and underinvestment. This confirms literature reviewed in Chapter Two, particularly by Cohen, Manion, and Morrison (2018) and Bwalya & Mutula (2016), who emphasized the influence of institutional context on EMIS outcomes. The lack of a data-driven culture and systemic learning mechanisms as described by Argyris and Schön (1978) further limits the ability of EMIS to evolve into a tool for continuous improvement and adaptive planning.

In conclusion, this study reveals that EMIS in non-formal education in Mfoundi is not fulfilling its transformative potential due to systemic, infrastructural, and cultural constraints. Theoretically grounded in both Systems Theory and the ISSM, the evidence suggests that technology alone is insufficient; organizational leadership, institutional trust, staff capacity, and cultural attitudes toward data use must also be addressed. Policy reforms should prioritize infrastructure enhancement, comprehensive training, leadership engagement, and incentives for data use. Only through a holistic and systemic approach can EMIS become a driver of quality, inclusive, and equitable education in Cameroon's non-formal sector.

Recommendations

Based on the research findings, three major strategic areas require urgent intervention to optimize the role of EMIS in non-formal education: (1) technical infrastructure and access, (2) human capacity and training, and (3) institutional culture and leadership engagement. The following recommendations are proposed:

1. Strengthen EMIS Infrastructure and Connectivity

The government, in collaboration with development partners and NGOs, should invest in robust EMIS infrastructure at non-formal education centres. This includes providing functional computers, tablets, stable internet access, uninterrupted electricity supply, and maintenance support. Mobile-based or offline EMIS solutions should also be explored, especially for rural or resource-constrained centres. Upgrading EMIS platforms to include user-friendly interfaces and automated reporting features will also enhance usage, aligning with the ISSM dimension of System Quality.

2. Enhance Staff Training and Digital Literacy

Targeted, ongoing professional development programs must be provided to all EMIS users—including administrative staff, literacy instructors, and center managers. These programs should move beyond introductory concepts and incorporate hands-on training in data entry, analysis, interpretation, and reporting. Trainings must also integrate pedagogical applications of EMIS—such as using learner attendance and performance data to inform instruction and support learners. This responds to both Service Quality and Use dimensions in the ISSM and reinforces Systems Theory’s emphasis on the human subsystem in functional organizations.

3. Institutionalize Data-Driven Culture for Planning and Decision-Making

Stakeholders should promote a shift from a compliance-based approach to EMIS toward a culture that values data for decision-making. Ministry of Basic Education officials and regional delegates should mandate periodic data reviews at centre level, integrate EMIS indicators into performance evaluations, and reward data-informed planning. This could include the use of EMIS data in allocating teaching resources, revising program content, and designing catch-up strategies for at-risk learners. This would support the ISSM dimension of Net Benefits and reinforce the Systems Theory call for effective feedback loops.

4. Establish Clear Policies and Monitoring Frameworks

Government should develop and enforce clear policies guiding the collection, use, storage, and sharing of data in non-formal education EMIS platforms. Monitoring and evaluation frameworks should be designed to track EMIS usage across centres. Such frameworks should include key indicators like data completeness, timeliness, user engagement, and decision-making impact. This institutional accountability mechanism will reduce data redundancy, improve trust, and ensure long-term system sustainability.

5. Foster Inclusive Partnerships and Equity in EMIS Adoption

Inequities in EMIS implementation between NGO-supported, faith-based, and public centres must be addressed. The Ministry of Basic Education should coordinate donor and partner efforts to ensure uniform access to EMIS tools and training across all centre types. A national platform or coordination mechanism could streamline support, reduce duplication, and ensure alignment with national education priorities and SDG 4 goals.

6. Embed EMIS Use into Teacher and Administrator Workflows

To encourage daily use of EMIS, centre-level procedures should be restructured to include EMIS tasks in teachers' and administrators' routine responsibilities. This includes integrating EMIS-generated reports into lesson planning, learner follow-up, and program coordination activities. EMIS should not be viewed as an additional task but rather as a practical tool embedded in educational processes. Leadership should lead by example and ensure regular review of EMIS data during meetings and planning sessions.

7. Introduce EMIS Literacy in Pre-Service and In-Service Education

Teacher training colleges and professional development programs should incorporate EMIS literacy into their curricula. This will ensure that future literacy instructors and centre leaders are already equipped with EMIS competencies upon entering the workforce. Additionally, refresher courses should be delivered regularly to maintain proficiency and adapt to system upgrades.

Suggestions for Further Research

1. **Examine EMIS Effectiveness Across Diverse Contexts:** Future studies should compare EMIS use in urban and rural non-formal centres, or between formal and non-formal education, to better understand contextual factors affecting success.

2. Explore Learner-centred Applications of EMIS: Research is needed on how EMIS can support learner personalization, such as adaptive learning, individualized remediation plans, or socio-emotional monitoring in non-formal settings.
3. Investigate Longitudinal Impact of EMIS: Long-term studies should assess how EMIS adoption affects educational quality, learner retention, and post-program outcomes over time. This would offer stronger causal insights for policy adjustments.
4. Assess the Role of Donor and NGO Influence on EMIS Adoption: Given that many centers in Mfoundi rely on external partners, future research should examine how donor priorities and funding modalities shape EMIS implementation and sustainability.
5. Evaluate Integration of EMIS in Teacher Training Institutions: Further research should analyze whether EMIS is being taught effectively in pre-service and in-service teacher training programs and how this affects later use in non-formal centers.

The integration of EMIS in non-formal education holds transformative potential for data-informed planning, equitable learner support, and improved program effectiveness. However, achieving this requires more than technological tools—it demands systemic reform, inclusive leadership, targeted investments, and a shared commitment to data use at all levels. These recommendations, grounded in both theory and field evidence, are essential steps toward transforming EMIS from a bureaucratic requirement into a strategic instrument for inclusive and quality lifelong learning.

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APPENDICES

REPUBLIQUE DU CAMEROUN
Paix - Travail - Patrie

UNIVERSITE DE YAOUNDE I

FACULTE DES SCIENCES DE
L'EDUCATION

DEPARTEMENT DE
CURRICULA ET EVALUATION



REPUBLIC OF CAMEROON
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THE UNIVERSITY OF YAOUNDE I

THE FACULTY OF EDUCATION

DEPARTMENT OF CURRICULUM
AND EVALUATION

The Dean

N° 139 /25/UYI/FSE

AUTORISATION FOR RESEARCH

I the undersigned, **Professor BELA Cyrille Bienvenu**, Dean of the Faculty of Education of the University of Yaoundé I, hereby certify that **NGONO MBOA Agathe Renée**, Matricule **23W3359**, is a student in Masters II in the Faculty of Education, Department: **CURRICULUM AND EVALUATION**, Specialty: **MANAGEMENT OF INFORMATION SYSTEMS AND EDUCATIONAL PLANNING**.

The concerned is carrying out a research work in view of preparing a Master's Degree, under the supervision of **Dr. SHAÏBOU Abdoulaï HAJL**. Her work is titled: "*The role of education management systems (EMIS) in enhancing non-formal education programs in Mfoundi division*".

I will be very grateful if you provide her all the information that can be helpful in the realization of her research work.

This Authorization is to serve the concerned for whatever purpose it is intended for.

Done in Yaoundé, le 17 MAR 2023

For the dean and by order



Appendix A: Instrument 1: Structured Questionnaire

Dear respondents my name is NGONO MBOA Agathe Renee, I'm a post graduate student The university of Yaoundé 1 Faculty Science of Education, department of Curriculum and Evaluation carrying out a dissertation on the topic 'the role of Education Management Information System (EMIS) in Enhancing Non-Formal Education in Mfoundi Division. Purpose: To collect quantitative data on participants' demographics, awareness, usage, and perceived barriers to EMIS in non-formal education.

Section A: Demographic and Institutional Information

1. **Age:**

- < 25 25–34 35–44 45–54 55+

2. **Gender:**

- Male Female Prefer not to say

3. **Highest Educational Qualification:**

- FSLC O'Level A'Level Bachelor's Master's Other (Specify):

4. **Current Role:**

- Center Director Literacy Instructor Data Clerk/Administrative Staff

5. **Type of Institution:**

- Government Literacy Center NGO/Community-based Private Training Center

6. **Years of Experience in Non-Formal Education:**

- < 2 years 2–5 years 6–10 years 11+ years

Section B: Awareness and Training on EMIS

7. Have you heard of EMIS (Education Management Information System)?

8. Yes No

9. Have you received any training on EMIS?

- Yes No

If yes, indicate source:

- Ministry workshop NGO Internal training Other (specify):

10. Rate your overall awareness of EMIS functions:

- Very Low Low Moderate High Very High

Section C: Use of EMIS in Your Center

Please indicate the frequency with which EMIS is used in your center for the following activities:

Activity	Never	Rarely	Sometimes	Often	Always
10. Tracking learner enrollment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Attendance monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Recording literacy assessment results	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Staff management & allocation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Resource & textbook inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Planning and decision-making	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section D: Perceived Challenges to EMIS Adoption

To what extent do the following challenges affect the use of EMIS in your center?

Challenge	Not at all	To a small extent	Moderate	Great extent	Very great extent
16. Lack of training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Poor infrastructure (electricity, computers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Limited internet connectivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. Staff resistance or reluctance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. Lack of institutional support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Section E: Suggestions for Improvement

21. What support would improve EMIS use in your center? (Tick all that apply)

- More training
- Better infrastructure
- Internet access
- Policy enforcement
- Regular monitoring
- Technical support staff
- Other (Specify): _____

22. Any additional comments?

Appendix B: Instrument 2: Semi-Structured Interview Guide

For Key Informants (Directors, Instructors, Clerks, Regional Officers)

Purpose: To elicit deeper insights into experiences, challenges, and institutional dynamics related to EMIS use in non-formal education settings.

Section 1: General Understanding

1. Can you describe your current role in the non-formal education system?

2. How familiar are you with EMIS and its objectives?

Section 2: Experiences with EMIS

3. What aspects of your work involve EMIS use?
4. How frequently do you use EMIS? For which specific tasks?
5. Can you describe any successes or benefits you've observed from using EMIS?

Section 3: Capacity and Training

6. Have you received any formal or informal training on EMIS?
7. What training content or formats have been most useful—or lacking?

Section 4: Infrastructure and Access

8. What infrastructure is available in your center to support EMIS use (e.g., computers, electricity, internet)?
9. How do these conditions affect your ability to use EMIS effectively?

Section 5: Organizational and Policy Context

10. How would you describe your institution's leadership and support for EMIS?
11. Are there specific policies, guidelines, or incentives that promote or hinder EMIS use?

Section 6: Challenges and Barriers

12. What are the biggest obstacles you face in using EMIS?
13. How do you or your colleagues cope with these barriers?

Section 7: Recommendations and Reflections

14. In your opinion, what should be done to improve EMIS use in non-formal education in Cameroon?
15. Is there anything else you'd like to share about your experience with EMIS?