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UNITE DE RECHERCHE ET DE FORMATION DOCTORALE EN SCIENCES DE L'EDUCATION ET DE L'INGENIERIE EDUCATIVE
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# AN APPRAISAL OF THE ROLE OF EDUCATION MANAGEMENT INFORMATION SYSTEM IN IMPROVING THE MANAGEMENT OF NON-FORMAL BASIC EDUCATION IN CAMEROON

**A dissertation submitted and defended on the 22th of July 2023 in fulfilment of the requirement for the award of the Master's degree in Educational Management**

Speciality*:* ***Information Systems Management and Educational Planning***



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This is to declare that this master's thesis entitled: "An appraisal of the role of education management information system in improving the management of non-formal basic education in Cameroon" is written by **FOMEN FONKEM Edwin**, registration number **20V3264** a Masters II student in the University of Yaounde I, Faculty of Education. I am the sole author of this thesis, and any sources of information borrowed from external sources have been appropriately referenced in the bibliography.

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# CERTIFICATION

This is to certify that this master's thesis entitled: "An appraisal of the role of education management information system in improving the management of non-formal basic education in Cameroon" is an authentic record of an independent research work done by **FOMEN FONKEM Edwin (20V3264)**, and submitted to the University of Yaounde I, Faculty of Education as part of the requirements for obtaining a Master's degree in Educational Management, with a specialization in Education Management Information Systems and Educational Planning.

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# DEDICATION

To my lovely wife, Mrs. Anna NANFA NTOWO Epse FOMEN, and my daughter, FOMEN NTOWO Latania Rhema

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## List of Acronyms and Symbols

| | |
|---|---|
| DQAF | Data Quality Assessment Framework |
| DSCE | Document de Stratégie pour la Croissance et l'Emploi |
| DSSEF | Document de Stratégie du Secteur de l'Education et de la Formation |
| ECCAS | Economic Community of Central African States |
| Ed-DQAF | Education Data Quality Assessment Framework |
| EFA | Education For All |
| EMIS | Education Management Information System |
| ENF | Education Non Formelle |
| FLC | Functional Literacy Centre |
| GPE | Global Partnership for Education |
| ICT | Information and Communication Technology |
| IIEP | International Institute for Educational Planning |
| IMF | International Monetary Fund |
| IS | Information System |
| IT | Information Technology |
| M&E | Monitoring and Evaluation |
| MDG | Millennium Development Goals |
| MINEDUB | Ministry of Basic Education |
| MINESEC | Ministry of Secondary Education |
| MINESUP | Ministry of Higher Education |
| MIS | Management Information System |
| NFBE | Non-Formal Basic Education |
| NFBEC | Non-Formal Basic Education Centre |
| NFE | Non-Formal Education |
| NFE-MIS | Non-Formal Education Management Information System |
| NGO | Non-Governmental Organisation |
| OECD | Organisation for Economic Co-operation and Development |
| SABER | Systems Approach for Better Education Results |
| SDG | Sustainable Development Goal |

| | |
|---|---|
| SIGE | Système d'Information pour la Gestion de l'Education |
| SND | Stratégie Nationale de Développement |
| SSA | Sub Saharan Africa |
| SWOT | Strengths Weaknesses Opportunities Threats |
| UIS | UNESCO Institute for Statistics |
| UNDP | United Nations Development Programme |
| UNESCO | United Nations Educational Scientific and Cultural Organisation |

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# *ABSTRACT*

*This evaluation research aims to identify the factors hindering the effective implementation of Education Management Information Systems (EMIS) in non-formal basic education. Non-formal education programs are vital for reaching marginalized and underserved populations, and EMIS can significantly enhance their management and monitoring. The study adopts a qualitative research design to gain an in-depth understanding of the barriers and challenges faced during EMIS implementation in non-formal basic education. Data collection was conducted through the use of the SABER – EMIS rubric. The population of this study comprised the personnel of the EMIS unit at the Ministry of Basic education. The sample was purposively selected to get the informants with the knowledge on the functioning of the EMIS. In order to assess the overall system, the collected data was benchmarked with the four policy areas of the SABER – EMIS rubric. Each level of the benchmarking scale then quantified, key themes and patterns were identified, highlighting the factors that hinder the successful implementation of EMIS. The findings were crossed verified with existing literature to ensure the credibility and validity of the results. From the findings we observe that much is still to be done for the EMIS at the Ministry of Basic education to adhere with accepted statistical standards as introduced by the Ed-DQAF. Based on this, a number of recommendations were made at the level of developing and implementing polies and regulations, funding, training and capacity building in the areas of data collection and statistics.*



*Key words: Management, Appraisal, Non – formal education, Management information system, Basic Education.*

# *RÉSUMÉ*

*Cette recherche d'évaluation vise à identifier les facteurs qui entravent la mise en œuvre efficace des systèmes d'information sur la gestion de l'éducation (EMIS) dans l'éducation de base non formelle. Les programmes d'éducation non formelle sont essentiels pour atteindre les populations marginalisées et mal desservies, et les SIGE peuvent considérablement améliorer leur gestion et leur suivi. L'étude adopte un modèle de recherche qualitative pour comprendre en profondeur les obstacles et les défis rencontrés lors de la mise en œuvre du SIGE dans l'éducation de base non formelle. La collecte des données a été réalisée à l'aide de la rubrique SABER - EMIS. La population de cette étude comprenait le personnel de l'unité SIGE du ministère de l'éducation de base. L'échantillon a été sélectionné à dessein pour obtenir des informateurs connaissant le fonctionnement du SIGE. Afin d'évaluer le système dans son ensemble, les données collectées ont été comparées aux quatre domaines politiques de la rubrique SABER - EMIS. Chaque niveau de l'échelle d'étalonnage a ensuite été quantifié, des thèmes et des modèles clés ont été identifiés, mettant en évidence les facteurs qui entravent la réussite de la mise en œuvre du SIGE. Les conclusions ont fait l'objet d'une vérification croisée avec la littérature existante afin de garantir la crédibilité et la validité des résultats. Les résultats montrent qu'il reste encore beaucoup à faire pour que le SIGE du ministère de l'éducation de base soit conforme aux normes statistiques acceptées telles qu'elles ont été introduites par l'Ed-DQAF. Sur cette base, un certain nombre de recommandations ont été formulées au niveau de l'élaboration et de la mise en œuvre de politiques et de réglementations, du financement, de la formation et du renforcement des capacités dans les domaines de la collecte de données et des statistiques.*

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*Mots clés : Gestion, évaluation, éducation non formelle, système d'information de gestion, Education de Base.*

# GENERAL INTRODUCTION

Institutions and organizations all over the globe are increasingly understanding the importance of information in the decision-making process. This has prompted the creation of a wide range of information systems, ranging from the purely manual, which relies mostly on pen and paper, to the computer-based, which relies primarily on computer hardware, software, and the internet. Measuring the quality of education in a timely and accurate manner is essential to any country's socioeconomic development.

Quality data maintained inside efficient information systems is ultimately required for successful decision-making. Information is a required resource generated by information systems, and it is a fundamental component of educational management and decision-making.

Many emerging nations still fall within the category of poor, as described by Education Management Information System. Data are disseminated slowly, and some of them are unreliable. There is a lack of information analysis and its contribution to the creation of better educational policies. The Human Development Network/Education of the World Bank developed the Systems Approach for Better Education Results (SABER) program to aid nations in better gaining access to and developing their EMIS. In order to ensure that all children and youth are given the knowledge and skills they need for life, SABER is intended to assist governments in systematically assessing and improving the performance of their educational systems.

Data of high quality is critical to achieving educational goals. Educational data not only helps countries to track their progress, but it also allows them to discover gaps in their educational systems and establish the policies, reforms, and programs required to close those gaps.

Data on educational inequities, learning outcomes, and lifelong learning has become increasingly complicated, necessitating additional data. While the education management information system (EMIS) does not capture all data, it is the backbone of a country's data gathering operations.

Data is essential to achieve SDG 4's aims. Educational data not only helps countries to track their development, but it also allows them to identify gaps in their educational systems.

EMIS has become an integral part of the global educational agenda. UNECSO and the Global Partnership for Education (GPE) acknowledged EMIS's growing relevance and sponsored an International Conference on EMIS from April 11 to 13, 2018 in Paris, France. UNESCO and GPE aimed to develop a forum for nations to share their experience in the reinforcement of

education data systems and explore prospective areas of collaboration through the International Conference on EMIS and the publication that resulted from it. The United Nations' Sustainable Development Goals (SDGs), announced in 2015, are a call to action to eradicate poverty, safeguard the environment, and guarantee that by 2030; everyone lives in peace and prosperity. This is achieved through universal and high-quality education (SDG 4), which benefits all people, particularly those living in areas with high levels of poverty, armed conflicts, and other emergencies. In some areas, these disasters have made schooling impossible. The notion that education is one of the most powerful and proven drivers for sustainable development is reaffirmed by achieving inclusive and high-quality education for everyone.

However, some of the goals contain NFE learning opportunities. SDG 4, target 4.2 (By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education) and target 4.4 (By 2030, substantially increase the number of youths and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship), will be impossible to accomplish without investing in all types of education, which is essential for human development and poverty reduction as well as successful social and economic development. NFBE should be given special attention since it is the most effective way to reach out to disadvantaged people. This is accomplished through the deployment of an effective EMIS and the availability of timely and quality NFBE data.

In order to improve the administration and management of the educational system in the context of decentralization and deconcentration, the Cameroon government via it’s strategy document for the education and training sector 2013 – 2020 has set a number of goals. The development of an integrated educational management information system is one of these goals. The goal is to ultimately have trustworthy, comprehensive, and real-time information about the education system in order to make the best decisions possible.

To accomplish this, the Cameroonian government will improve the information system by maximizing what now exists and ensuring that the system is accessible to future institutional and technical development. The government will implement strategies to ensure the availability of human resources required for the development and administration of the EMIS for educational system steering structures. In this context, the government has allocated adequate budgetary resources to the creation and distribution of secure statistics. By 2020, the EMIS should be able to

assure the unique registration of learners at all levels of study, allowing the Cameroon government to better track students as they progress from elementary to higher education, including vocational training and departures from the formal education system.

Cameroon's Ministry of Basic Education has a well-established and functioning EMIS. For the Ministry of Basic Education, this EMIS publishes an annual statistics yearbook. This book's content focuses mainly on formal education, with little or no mention of non-formal basic education (NFBE). Due to the scarcity of NFE data and the lack of practical and adequate demand and supply-side indicators in the context of decentralization, there is a significant lack of coordination within administrative hierarchies, as well as between sectors and the Non-Governmental Organization (NGO) community.

The focus of this research is to evaluate the EMIS at the Ministry of Basic Education on the production of quality data and how this can improve the management of NFBE in a decentralized setting.

**Justification of the study**

The development of national education systems in developing countries over the past decades has prompted an increased need for information and data. This need underpins the development and implementation of robust national sector policies and plans, appropriate levels of sector management and monitoring and evaluation (M&E) (UNESCO,2018a).

In order to pursue the new global educational agenda, data are crucial. Data are necessary for countries to identify goals, operationalize those goals into targets, and, most crucially, decide how to move more quickly toward those aims.

It is becoming more widely acknowledged that basic education for "ALL" cannot be provided by schools alone. One could argue that there has been significant global progress toward Education For All (EFA) since the 2000 World Education Forum, the Millennium Development Goals (MDG), and more recently the Sustainable Development Goals (SDG4), especially with regard to enrolment and gender parity at the primary level. Several types of provision through various learning paths are necessary to protect the right to education of persons who are not enrolled in schools.

One route is non-formal education. Characterized by a high degree of adaptability and openness to new ideas in its structure, teaching, and delivery methods. Data on educational outcomes, such as literacy, numeracy, and non-formal education, are scarce.

Being the primary tool used by nations to gather, process, analyse, and disseminate data, education management information systems (EMIS) are essential to this process.

Therefore, it is crucial to conduct an EMIS diagnostic using current methodologies in order to assess the system and ensure that it produces the desired results.

**Problem statement**

The effective implementation of Education Management Information Systems (EMIS) in non-formal education settings is crucial for optimizing data-driven decision-making, enhancing administrative efficiency, and improving educational outcomes for marginalized learners. According to Powell (2006), "there is a growing demand for information systems to generate more elaborate data concerning educational processes and outcomes, the allocation of resources, the efficacy of novel teaching methods, and the adaptability of current educational offerings". However, despite the potential benefits, there are significant challenges and barriers that hinder the successful integration and utilization of EMIS in non-formal education programs. To address this gap, this evaluation research aims to identify the factors hindering the effective implementation of EMIS in non-formal education.

The problem of ineffective EMIS implementation in non-formal education raises concerns regarding the accessibility and utilization of accurate and reliable data for planning, monitoring, and evaluating educational initiatives. These challenges may include limited technological infrastructure, inadequate training and capacity building, data privacy concerns, and difficulties in integrating non-formal education data into the EMIS system. Furthermore, the unique characteristics of non-formal education, such as diverse program structures and locations, may contribute to additional complexities in adopting EMIS effectively.

Without a comprehensive understanding of the factors hindering EMIS implementation in non-formal education, educational policymakers, administrators, and stakeholders, face significant barriers in utilizing data-driven strategies to improve program effectiveness and address the specific needs of marginalized learners. Thus, this research aims to address these gaps by

conducting an evaluation to identify the challenges and barriers that hinder effective EMIS implementation in non-formal education settings. The findings of this study will inform the development of targeted strategies and recommendations to overcome these challenges, enhance EMIS utilization, and foster better data-driven decision-making in non-formal education programs. Ultimately, addressing these factors will contribute to advancing the equitable provision of education and improving educational outcomes for marginalized populations in non-formal education settings.

## Research Objectives

### Main objective

The main objective of this study is to identify key factors hindering the production and dissemination of quality data on non-formal basic education in Cameroon.

### Specific objectives

- Examine the national policy framework for non - formal basic education.
- Investigate how the system contributes to better monitoring and evaluation of educational policies and programs.
- Propose good practices and opportunities to improve the current situation for optimal adherence with accepted statistical standards as introduced by the Ed-DQAF.

## Research Questions

### Main Research Question

What are the key factors hindering the production and dissemination of quality data on non-formal basic education in Cameroon?

### Specific Research Questions

- What is the national policy framework for non - formal basic education?
- How does the system contributes to better monitoring and evaluation of educational policies and programs?
- What actions can improve the current situation for optimal adherence with accepted statistical standards as introduced by the Ed-DQAF?

## Significance of the Study

The results of this study is going to be helpful to the following groups of people:

### Managers and Administrators

Education Management Information System (EMIS) evaluation is the process of assessing the effectiveness of the system in achieving its intended goals and objectives. EMIS evaluation is significant to managers and administrators in several ways:

*Identifying system strengths and weaknesses:* This study will help managers to identify the strengths and weaknesses of the system, enabling them to make informed decisions about system upgrades, modifications, or replacements.

*Assessing user satisfaction:* it will equally help managers and administrators to assess user satisfaction with the system, enabling them to identify areas for improvement and address user concerns.

*Measuring system impact:* The study will help managers and administrators to measure the impact of the system on student outcomes, teacher performance, and other key metrics, enabling them to determine the value of the system to the organization.

*Improving system effectiveness:* our study will help managers and administrators to improve the effectiveness of the system by identifying areas for improvement and implementing changes to enhance system functionality.

*Ensuring system compliance:* Finally, this research will help managers to ensure that the system is in compliance with legal and regulatory requirements, enabling them to avoid penalties and legal risks.

Overall, this study is critical for managers and administrators to ensure that the system is meeting the needs of the organization and achieving its intended goals and objectives.

### To teachers

Teachers will find this study is significant for teachers in several ways:

*Ensuring data accuracy:* It will help ensure that the data being collected and used by the system is accurate, reliable, and relevant to teachers' needs.

*Improving data usability:* Identification of ways to improve the usability of the system, making it easier for teachers to access, analyse, and use data to inform their teaching practices.

*Enhancing professional development:* This is through identify areas where teachers need additional training or support to effectively use the system and its data to enhance their professional development.

*Supporting evidence-based decision making:* This study will provide teachers with the necessary data and tools to make informed, evidence-based decisions about their instructional practices and student learning outcomes.

*Enhancing teacher collaboration:* Promote collaboration among teachers by providing a platform for them to share data, best practices, and insights about effective teaching practices.

Overall, this study is significant for teachers as it helps to ensure that the system is functioning effectively and providing them with the necessary data and tools to enhance their instructional practices and support student learning.

**To education stakeholders**

The significance of this study to education stakeholders lies in the following aspects:

*Ensuring accountability:* The study will help ensure accountability in the education sector by assessing whether the system is effectively measuring and reporting on education outcomes, and whether education policies and programs are achieving their intended goals.

*Improving resource allocation:* It will help education stakeholders to allocate education resources more effectively and efficiently by identifying areas where investments can be made to enhance education outcomes.

*Enhancing collaboration:* Promotion of collaboration among education stakeholders by providing a platform for them to share data, insights, and best practices, enabling them to work together more effectively towards common education goals.

*Facilitating evidence-based decision-making:* It will provide education stakeholders with the necessary data and tools to make informed, evidence-based decisions about education policies, programs, and practices.

*Enhancing transparency:* This result from this study will enhance transparency in the education sector by providing education stakeholders with access to accurate and reliable data on education policies, programs, and performance, enabling them to make informed decisions and hold education providers accountable.

Overall, this assessment of the EMIS at MINEDUB is significant to education stakeholders as it helps to ensure that the education system is functioning effectively and efficiently, and that education policies and programs are achieving their intended goals. It provides education stakeholders with the necessary data and insights to make informed decisions about education policies, programs, and practices, and ultimately leads to improved education outcomes for students and educators alike.

**To the education sector**

This study is significant to the education sector in several ways:

*Effective resource allocation:* This study will help to allocate education resources more effectively and efficiently, ensuring that education programs and policies are achieving their intended goals and that resources are being used efficiently.

*Evidence-based policy making:* It will provide the education sector with the necessary data and tools to make informed decisions about education policies, programs, and practices, ensuring that policy decisions are evidence-based and aligned with education goals and objectives.

*Monitoring and evaluation:* It will enable the monitor and evaluate the effectiveness of education policies and programs over time, identifying areas for improvement and informing future policy decisions.

*Accountability and transparency:* This study will promote accountability and transparency in the education sector, ensuring that education providers are held accountable for achieving education goals and that stakeholders have access to accurate and reliable data on education policies, programs, and performance.

*Improved education outcomes:* Lead to improved education outcomes, as it helps to ensure that the education system is functioning effectively and efficiently and that education policies and programs are achieving their intended goals.

Overall, this evaluation is significant to the education sector as it helps to ensure that education policies and programs are aligned with education goals and objectives, resources are used efficiently, and education providers are held accountable for achieving education outcomes. It provides the ministry with the necessary data and tools to make informed decisions about education policies, programs, and practices, ultimately leading to improved education outcomes for the country.

## Delimitation of the study

### Geographical delimitation

This study was carried out at the central level (at the Ministry of Basic Education), given that the EMIS is not decentralised to the regional levels.

### Thematic delimitation

This study falls within the domain of education management information systems. It focuses on the assessment of the current state of the EMIS in terms of production of quality data at the Cameroon Ministry of Basic Education. This evaluation will be limited to the use of the Systems Approach for Better Education Results (SABER) - EMIS rubric with associated best practises and scoring categories.

This study is important because we have realised that there is still much be done for the EMIS to respect international standards.

## Organisation of work

This study consists of four chapters. Chapter one gives a general orientation as to the main concern of the work by giving conceptual view of education management information systems (EMIS). Chapter two reviews the literature on issues which are linked to the main theme of this study. The theoretical framework equally constitutes part of this chapter. The third chapter presents the methodology that was adopted for the study. This methodology chapter shows how issues related to the work shall be investigated upon with regards to the preoccupations raised in the introductory part. Chapter four presents the findings that came out from the investigation. Discussion and analysis of the findings also constitute this chapter.

# PART I:

# CONCEPTUAL AND THEORETICAL FRAMEWORK OF THE STUDY

# CHAPTER 1: DEFINITION OF CONCEPTS

This chapter introduces the concept of education management information system. It provides us with a comprehensive understanding of the main theme of our study. Before we examine research in the area of management information systems, it is crucial that we establish a few key terms that will be used frequently.

**Information System (IS)**

Raw facts are what make up data, such as the number of employees, total hours worked, or the quantity of units produced on a production line.

A collection of data that has been arranged and processed to have worth beyond the value of the individual facts is called information. For instance, a salesperson may desire a summary of sales that includes the month's total sales.

Before diving into what an education management information system is, it is important we examine what an Information System (IS) is and particularly what is a Management Information system (MIS).

An information system is a collection of interconnected parts that gather, process, store, and disseminate data and information. An information system also offers a feedback mechanism to monitor and control its operations to ensure that it continues to meet its goals and objectives. The feedback mechanism is essential for assisting businesses in achieving their objectives; including better management and enhanced customer service (Stair & Reynolds, 2017, pg.7).

Information could be divided into Descriptive Information, Diagnostic Information, Predictive Information, and Prescriptive Information, according to the taxonomy proposed by Harsh, Connor, and Schwab.

***Descriptive information:*** The descriptive information serves as the starting point for the classification of information and serves as the foundation for all other forms of information. developing a descriptive class of information scenario for the company at a specific period. As an illustration of an educational system, it discusses:

- The total number of enrolled students;
- the disciplines and courses offered;
- the success of the placement process;

- the marketing strategy used and its effect on enrolment;
- and the recognition of its courses by the end users, such as business organizations, government agencies, educational institutions, and the private sector.

***Diagnostic information:*** Information from diagnostic tests sheds light on the issues. What are the root causes of the issues? What is still unfinished? What needed to be done? These are the topics that diagnostic information covers. In the context of educational institutions, the kinds of information required under this category of information include:

- Why is student enrolment below expectations?
- Where are more people registering, and why?
- What subjects are the most popular?
- What motivates students to enrol in this institution?
- Has the chosen marketing strategy produced equivalent outcomes?
- Why did students who were initially enrolled switch to another institution?
- Are the course fees reasonable compared to those at other modern universities?

Education planners and regulators establish norms and standards based on the diagnostic data. Gap analysis is done to find areas of opportunity as well as areas of worry. The information at hand is used to create the best possible action plans.

***Predictive information: "What-if...?"*** information is related to predictive information. This type of information aids in the analysis of potential future strategies. This information makes an effort to pinpoint the ideal results. Predictive data is essential for predicting, developing long-term plans, identifying future resource mobilization opportunities, and determining what kinds of marketing techniques will be more workable. Predictive information is heavily used in budgeting strategies, simulation models, and other management tools that firms utilize.

***Prescriptive information:*** The question of what should be done and what can be done is answered by predictive information. Predictive information is the primary source for such analyses. The output of the predicted information is considered in light of the organization's established aims and values. For instance, a school might provide integrated courses to help students maintain their education when they need to pursue further education in the future. At that point, the competition can be really important. However, a student from the same institute will have a greater probability of admission because they are more familiar with the requirements and standards of the institution.

Even the institute is more optimistic about the potential success of its own students. Some educational institutions provide dual degrees, wherein a portion of the education is delivered at the mother institution and a portion at an institution abroad. This institute may be the mother institute that originally accepted the student or it may be another institute with a completely separate identity that collaborates with the mother institutes.

Studying abroad gives students access to world-class education that would otherwise be out of their financial reach. Such top-notch exchanges raise the calibre of instruction. In addition to studying in a dream setting and competing on a world-class syllabus, students also have the chance to interact with world-class instructors.

**Characteristics of quality information**

Fundamental to the quality of a decision is the quality of the information used to reach that decision. Any organisation that stresses the use of advanced information systems and sophisticated data analysis before information quality is doomed to make many wrong decisions. Below is a table that lists the characteristics that determine the quality of information. The importance of each of these characteristics varies depending on the situation and the kind of decision you are trying to make.

Table 1 Characteristics of quality information

| **Characteristic** | **Definition** |
|---|---|
| Accessible | Authorized users should have easy access to information so they can get it when they need it and in the proper manner. |
| Accurate | Information that is accurate is error-free. In some cases, inaccurate data is fed into the transformation process, which results in the generation of inaccurate information. This practice is known as garbage in, garbage out. |
| Complete | All the crucial details are included in complete information. A complete investment report, for instance, would include all important charges. |
| Economical | It should be reasonably inexpensive to produce information. Always strike a balance between the information's worth and production costs when making decisions. |

| | |
|---|---|
| Flexible | Flexible information can be applied to many different situations. For instance, knowing the school completion rate can help a school head to make adjustments on enrolments, an educational planner take concrete action and different stakeholders in decision-making. |
| Relevant | The decision-maker values relevant information. An educational planner would likely find it useful to know that enrolment rates had decreased. |
| Reliable | Users can have confidence in reliable information. The reliability of the information is frequently influenced by the reliability of the method of collection. In other cases, the information's source determines its reliability. A rumour from an unidentified source might not be reliable. |
| Secure | Information must be protected against unauthorized persons accessing it. |
| Simple | Information should not be complex but rather simple. Sometimes complex and in-depth information is not required. In fact, having too much information can lead to information overload, which hinders a decision-maker from deciding what is most important. |
| Timely | Timely information is delivered when it is needed. Trying to pick what coat to wear today without knowing the weather from last week won't be any easier. |
| Verifiable | Verifiable information must be provided. This implies that you may verify it to make sure it is accurate, perhaps by looking up the same information in several different sources. |

Source: *Fundamentals of Information Systems*. (9th Ed., pg. 6) by M.S. Ralph, & W.R. George, 2018, Cengage Learning.

Whatever its design and purpose, an information system includes four essential parts to gather, organize process, analyse, and disseminate information:

- People
- Technology
- Processes
- Data

***People:*** People are involved in the creation, launch, and maintenance of all information systems. They play a variety of responsibilities, including those of analysts, users, contributors, customers, and information system developers and managers. The importance of the human factor in the success or failure of most information systems is frequently underrated.

***Technology:*** Hardware, software, and telecommunications are all parts of information technology (IT). The system's machinery is represented by the hardware. It is any apparatus that can gather, analyse, store, or display electronic data. The software is a collection of instructions (programs) that tell the hardware how to operate and how to output certain results.

The primary function of telecommunications equipment is to transmit electrical signals from one location to another while also adding features to boost transmission speed.

***Processes:*** This is the collection of actions planned to complete a task. Information systems are implemented by businesses to assist, streamline, and occasionally eliminate business operations. Numerous decisions are made on the operation of each process, the regulations it should follow, the management of information from input to output, and particularly the way the information system will assist the process. Consider: Which decisions, based on incoming data and rules, can the information system make on its own, and which ones need human judgment.

***Data:*** Data can be viewed as a collection of undisputed basic facts. Those are the kinds of things IS would generally need to get from you or other sources. However, after being combined, indexed, and logically arranged using software like a spreadsheet or database, the raw data will reveal fresh information and insights that a single raw fact cannot. Organizations gather a variety of data, process it, and organize it in some way before using it to inform choices. The organization can then be improved after these decisions have been evaluated for effectiveness.

### Role of Information Systems in Operations

Information systems have become an integral part of modern organisations. They have transformed traditional practices by enabling real-time communication, efficient data management, and automated processes. The benefits of information systems in business operations include:

***Improved Efficiency:*** Information systems automate routine tasks, reduce errors, and improve data accuracy. They provide a standardized interface for data entry and retrieval, reducing the time and effort required to process data. For example, a retail store may use a barcode scanning system to automate inventory control and reduce the time required to check stock levels.

***Data Collection:*** Information systems collect data from various sources, including internal and external sources, to support organizational functions. Data collection involves the use of various input devices, such as scanners, keyboards, and sensors, to capture data in digital form. Information systems also provide data validation and verification to ensure that data is accurate and complete.

***Data Storage:*** Information systems store data in various forms, including databases, files, and documents. Data storage involves organizing and categorizing data to facilitate easy retrieval and processing. Information systems also provide security features to protect data from unauthorized access, modification, or destruction.

***Data Processing:*** Information systems process data to extract meaningful information and insights that support organizational decision-making. Data processing involves the use of software applications, such as data analytics, artificial intelligence, and machine learning, to analyse data and identify patterns and trends. Information systems also provide data visualization tools to facilitate data interpretation and communication.

***Data Dissemination:*** Information systems disseminate data to support organizational communication and coordination. Data dissemination involves the use of various output devices, such as printers, monitors, and mobile devices, to present data in various forms, such as reports, charts, and graphs. Information systems also provide collaboration and messaging tools to facilitate communication and coordination among stakeholders.

***Decision Support:*** Information systems support organizational decision-making by providing access to real-time data and analytical tools. Decision support involves the use of software applications, such as business intelligence, data mining, and predictive analytics, to analyse data and provide insights that support decision-making. Information systems also provide decision-making frameworks, such as decision trees and expert systems, to facilitate decision-making.

***Control and Monitoring:*** Information systems provide control and monitoring features to ensure that organizational processes and activities comply with established policies, standards, and regulations. Control and monitoring involve the use of software applications, such as audit trails, access controls, and security management, to detect and prevent unauthorized access, fraud, and other security breaches.

***Strategic Planning:*** Information systems support organizational strategic planning by providing access to strategic information and insights. Strategic planning involves the use of software

applications, such as scenario analysis, SWOT analysis, and portfolio analysis, to assess organizational strengths, weaknesses, opportunities, and threats. Information systems also provide benchmarking and best practices data to support strategic planning.

**Management Information System (MIS)**

An organization's management activities are supported by a management information system (MIS),

which is an organized, diversified, and automated information system that is concerned with the process of obtaining, storing, and distributing pertinent information (Mishra, Kendhe & Bhalereo,2015). The information is dissipated throughout the many organizational departments. The processing of data takes occur in many forms such as graphs, diagrams, charts, reports to provide accurate and useful information for the management. MIS provides central storage of all the business information. Every level of an organization uses MIS. Information management systems (MIS) are essential for not only gathering and managing information but also expressing it in various ways that help management make critical organizational decisions.

The notion that managers must ingest vast amounts of data, transform that data into information, draw conclusions from that knowledge, and make decisions that contribute to the attainment of company objectives is further emphasized by Mishra, Kendhe & Bhalereo.

Information is just as valuable to a company as cash, equipment, and labour are. It is necessary for the business to survive. Therefore, management information systems are essential for managing information, making it simple for managers to gather, combine, and assign information, and ensuring that decisions are made effectively and efficiently.

According to Shah (2014), management information systems are those that use the data required by management organizations at every level. Making tactical, operational, and strategic decisions with a focus on creating and putting into practice procedures, processes, and routines that deliver comprehensive reports in an accurate, dependable, and timely way.

Ahmed (2007) on his part highlights that three fundamental parts make up a management information system (MIS): management, information, and system. In an effort to accomplish predetermined goals, management attempts to coordinate the effort of human and material input It describes all the work we put into organizing and systematizing the processes we use, the tools we employ, the individuals engaged in creating and utilizing an EMIS, as well as the connections

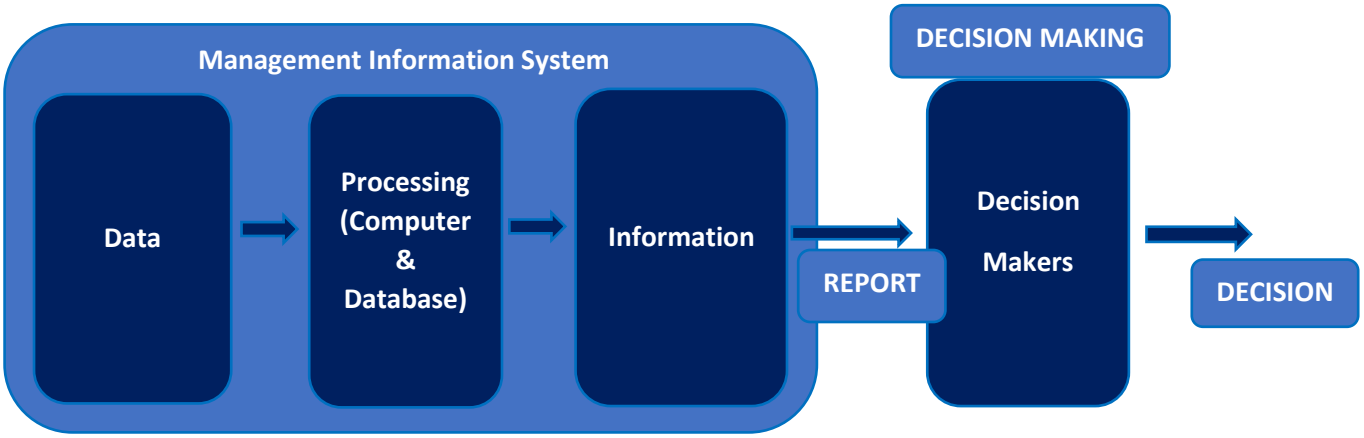
between the EMIS as a repository of data, its users, and its relationships with other parties (Tegegn, 2003).

Information is a new "knowledge" that users utilize to improve planning, programming, monitoring, evaluating, reviewing, and making decisions on overall management of educational progress. Together, a System is creating a relationship and overall vision. Each element aids in the system's efficient operation. Regardless of how well our data gathering, processing, and analysis processes are implemented, if the results are never used to advance educational development, the system will not function as intended. Clear knowledge of the underlying difficulties is made possible by the combined usage of these three elements. Effects of each component on additional, seemingly unrelated inputs yet connected to one another. Waweru (2016) claims that MIS is an integrated technique for acquiring pertinent information from any source and translating it in to usable form for management decision-makers.

All information-providing systems across all organizational levels are included in the management information system, although it must be emphasized that this is a collection of systems rather than a single comprehensive system (Tegegn, 2003). This suggests that the various information systems involved have been integrated to some extent. This definition of a MIS, though broader than that of a fully justified because the information systems of all the organizations' functions are increasingly linked together in a system of essentially independent information systems, so that no information system can be viewed as completely distinct from the others (Ashenafi, 2013).

In a study by O'Brien & George (2007), MIS provide information in the form of pre-specified reports and displays to support business decision making.

Figure 1 Relationship between Management Information Systems and Decision-Making




Source: "The Impact of Management Information Systems Adoption in Managerial Decision Making: A Review. International Journal of Information Management", by Y. H. Al-Mamary, A. Shamsuddin, & N. Aziati,2014, *International Journal of Information Management, 34*(2), 387-394.

The education data is very complicated, and therefore, a structured and systematic solution is necessary to examine the whole education system comprehensively through statistics. Governments lack the required information about their education systems, which is necessary for managing data related to the system, responding to policy questions, and adapting to changing reforms. Such a system will enable policy interventions on high-stakes issues such as "How does teacher qualification affect student performance?" In recent years, several countries have reformed their education systems by collecting more data at the local level and using performance indicators and learning outcomes to monitor educational performance (Bruns, Filmer and Patrinos 2011). This highlights the significance of collecting information at subnational levels in relation to education targets, outcomes, and costs. Consequently, a system that collects, maintains, and disseminates timely and pertinent information about the education system is essential.

Education Management Information System is a system for the collection, integration, processing, maintenance and dissemination of data and information to support decision - making, policy - analysis and formulation, planning, monitoring and management at all levels of an education system. It is a system of people, technology, models, methods, procedures, rules and regulations that function together to provide education leaders, decision - makers and managers at

all levels with a comprehensive, integrated set of relevant, reliable, unambiguous and timely data and information to support them in completion of their responsibilities. (UNESCO, 2008:101).

The goal of an EMIS is to produce high-quality, reliable, and timely information in order to promote the use of educational data in decision-making. EMIS data should be adapted and made accessible to all levels of decision-making in the school system in order to be helpful (UNESCO 2012 framework for the use of EMIS data be level of decision making). This is achieved by integrating information relating to the administration of educational activities and making it accessible to a wide range of users in a comprehensive manner. Teachers, principals, curriculum planners, inspectors, financial controllers, planners, policy consultants, political leaders, and students are among those affected. In this way, the EMIS's integrated information resources are available to the whole community.

Overall, EMIS has the following objectives:

Improve educational management data processing, storage, analysis, and supply capacities so that educational planners and administrators have access to reliable and timely data.

To bring together and improve diverse efforts in the acquisition, processing, storage, transmission, analysis, repackaging, dissemination, and use of educational management data.

To make it easier for various agencies and individuals at all levels to use relevant information for more efficient educational planning, implementation, and management.

By reducing and eliminating duplications, as well as filling information gaps, the flow of information for decision-making may be improved.

To provide information for policy discussions and development scenarios for the educational system.

Underlying principles of EMIS can be understood in terms of eight main aspects or dimensions:

***Need of producers and users****:* This is the building of the system and the actors who are going to use it. The EMIS should be built by taking into considerations the needs and aspirations of the country. If possible, the building of the system should ne done by the EMIS unit of the ministry concerned but if this is not possible, professional companies in charge of software development can be hired. Professionals (both hardware and software) are also needed to effectively operate the system. These professionals need to be trained in the use of the EMIS to ensure the desired results are attained.

***Data:*** Raw facts and numbers are referred to as data. It says nothing on its own. The real goal is to convert data into information. When data is provided in a context that allows it to answer a question or aid decision-making, it becomes information. Stronger judgments may be made when this data is combined with a manager's knowledge, experience, and skills.

***Information handling:*** Information handling is the act of collecting, documenting, and presenting data in a way that makes it easier to evaluate, predict, and make decisions.

***Storage of data****:* Data storage refers to the process of storing data in electronic or other formats for later use by a computer or device. In a computing context, different forms of data storage serve diverse functions. There are new choices for distant data storage, such as cloud computing, that can change how users access data in addition to hard data storage.

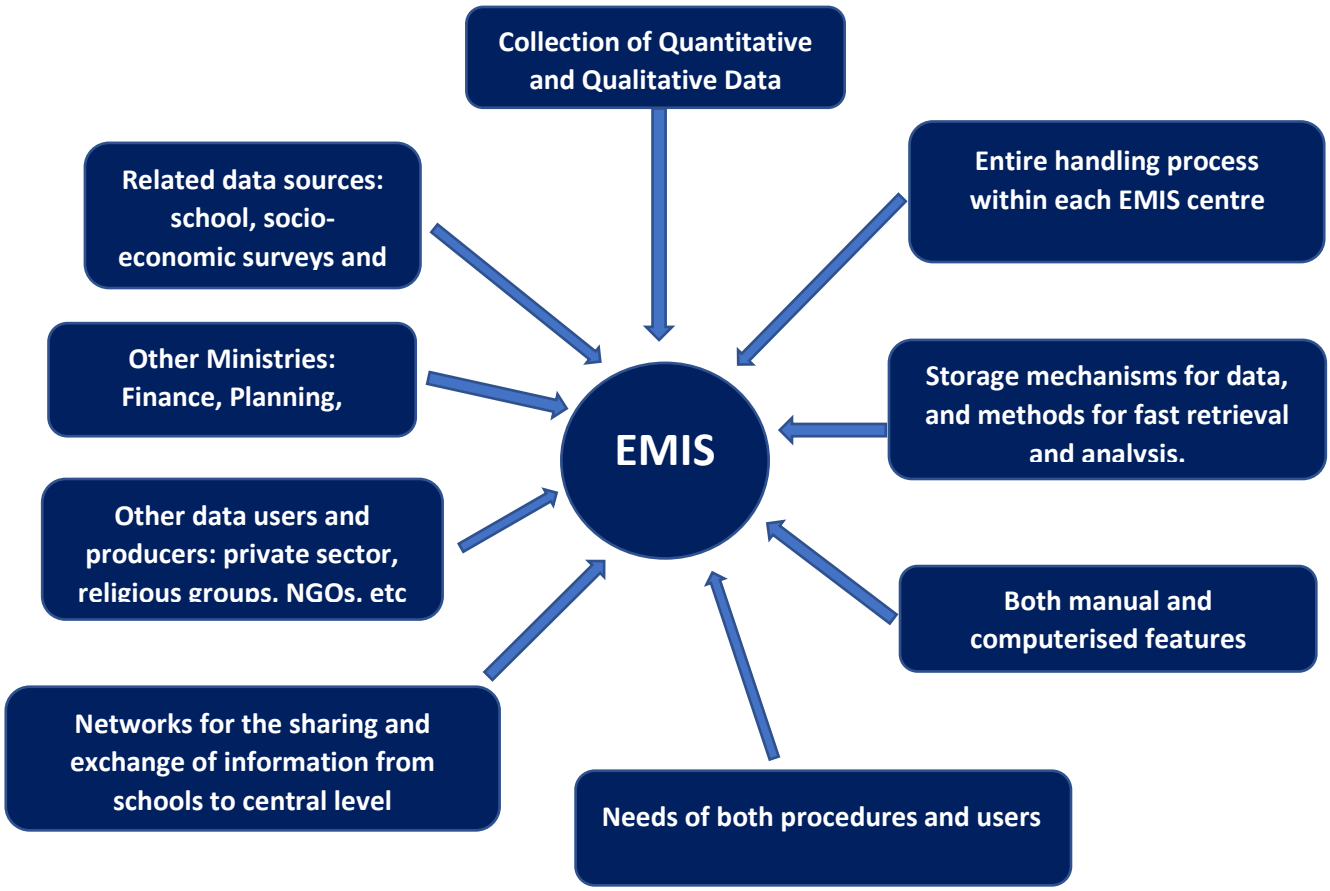
***Retrieval of data****:* The process of selecting and extracting data from a file, a group of files, or a database is known as data retrieval (a database is an organized collection of data). Data retrieval allows data to be obtained from a file or database and displayed for users.

***Data analysis:*** Cleaning, transforming, and modelling data to identify useful information for decision-making is characterized as data analysis. Data analysis is used to extract useful information from data and make decisions based on that information.

***Computer and manual procedures:*** This refers to the machinery (information and communication technologies) and the resources that establishes guidelines and protocols for all major principles, actions and decisions of the system. They help ensure optimum operations and consistent delivery of services.

***Networking among EMIS centres****:* This refers to the telecommunication resources that facilitate resource flow of information in the organization. Decentralization of EMIS tasks is becoming more and more important and as a result, the various EMIS unit need to the connected via a network to ease information exchange in real – time.

Figure 2 Dimensions of Integration of EMIS




Source: *Education Management Information System (EMIS) and the formulation of education for all (EFA)* (p. 7), by C.C. Villanueva, 2003, UNESCO.

**EMIS data management cycle**

In this section we will go through the steps required to get the data from the field, process it, and take the results back to the users. This goes in a similar fashion to a cycle. This is a procedure chained together which we need to adhere to in order to achieve an efficient result. Any break in the middle of the procedure affects the final result. Moreover, it is an EMIS manager should see to it that every member in the cycle is performing well to achieve the desired result. If the school records are not maintained, no matter how well formulated data collection instruments are, the feasibility of data collection system is hampered. It is no point working hard in the processing of

the collected data nor spending more time calculating indicators, it would not change the result substantially.

- **Data Collection:** If you do not have good system of records management at school level, do not expect desired results out of the data collection system. The school remains the core source of most of the required data items often not recorded in the manner desired. It is the responsibility of the EMIS manager to see to it that the records at school level be maintained properly. Most often data is collected through questionnaires. These are prepared at the centre in a centralized system or regional level in a decentralized system. Whichever method is followed, questionnaires are used to collect school data annually. Knowledge of what planners, decision makers, researchers and other users need is required. What we collect should satisfy their needs, as much as possible. Therefore, we need to closely attend to their needs. The way to assess the need of users is to take notes when attending meeting with them, casual discussions, and by having them comment on the instrument of data collection by listening to their presentation and by reading policy and plan papers.
- **Building of tools**
  - ***Instrument Design:*** In most education ministries, core routine data is obtained using surveys. This is possibly due to the fact that it is easier and less expensive to do so. As a result, great consideration must be given to the design of such an instrument. The questions should be well-formulated, as well as the arrangement and structure of the language. Furthermore, we must consider not just what we expect, but also what the person on the other end interprets the questions to mean. The questionnaire should be written and designed by an expert person.
  - ***Pre – testing:*** The instrument should be pre-tested after it has been designed. This can be accomplished by limiting the number of schools to which the instrument is used. This is beneficial in several ways:
    - ✓ We gain insight into how the receiver interprets the questions, allowing us to change or modify the questions to suit both the sender and the recipient.
    - ✓ We can better estimate how long it will take to construct the device.
    - ✓ We can learn more about how school records are managed and how simple the questionnaire is to complete. It is worth noting that the instrument's pre-testing should involve users - especially, departments within the Ministry of Basic Education, with a focus on the planning department.

- ***Instrument Redesign:*** After the pre-test is completed, the adjustments must be properly implemented. In practice, a full debate is required to learn from one another and ratify the instrument's adjustments. The crucial thing to remember is why the adjustments were made in the first place. It is advisable to avoid making the same mistakes as previously and to examine the instrument thoroughly before going out for pre-testing.
- ***Publication:*** The instruments must be published when the pre-testing is done and the adjustments are implemented. However, before sending the final copy of the instrument to the publishers, an estimate of the number of copies per area and division, with contingency included in, must be made, as well as a cost estimate for the publishing. In practice, the latter requires approval from upper management, and there is typically a set method to follow.
- ***Distribution:*** The distribution program will need to be prepared after the instruments are released. The distribution timetable can be based on the prior estimate of the quantity of copies.
- ***Follow - up:*** Instrument distribution is generally done in phases. It is distributed by the centre to regions, which then distribute it to divisions, sub-divisions, and schools. As a result, it may take some time for the instruments to reach the schools. Furthermore, the schools require time to finish the instruments before returning them to the same level of administration - schools - sub-divisions - divisions - regions - and eventually higher administrative levels. We want to make sure that all schools receive needed copies in a timely manner so that they may complete them and return them on time.

- **Data collection, processing and analysis:** For the collecting of educational data from educational institutions, several countries give distinct duties and obligations to different departments. Data collecting for various educational subsectors may be the duty of multiple ministries in some countries. The data collecting procedure for an information base is not something that can be done in a single step. This knowledge base must be dynamic and have a method for regular updates in order to be effective for monitoring (IIEP, 2021). Following the acquisition of data from various entities and data entry (if manual collection was used), data must go through a data validation procedure (Abdul - Hamid, 2017). Data validation is a step in the data processing process, which occurs after the data has been collected. Because data might contain personal and sensitive information, solid data storage and protection methods are required. After gathering and processing, the next stage is analysis. The needs of EMIS end users, such as decision-makers, planners, researchers, information service providers, students, and instructors, should be

considered while analysing data. The availability of EMIS data for educational institutions encourages the use of data to better administer education.

- **Data reporting, dissemination and use:** The plan for reporting and dissemination is for all stakeholders to have access to the relevant information generated by EMIS. Reports can be written in a variety of formats for various reasons (Wako, 2003):

  Annual statistics returns; this comprises statistical tables and indicators that anybody within and outside the Ministry of Education can utilize.

  A brief description of the annual statistics returns is included in the quick references. This is aimed at upper-level decision-makers and anyone who does not want extensive statistics.

  Indicators report; this comprises a regular study of the performance of the school's systems.

  The ability of the EMIS team to present the statistics in a clear and intelligible manner to other levels of administration and other users, whether for internal or external usage, is equally critical to the reporting and dissemination process. Internal information, for example, will be shared with Ministry of Education planners, specialists, and educational administrations. This method can result in more effective planning, policy implementation, and review. External reporting establishes a feedback loop inside the internal system, for example, by offering strategies to improve students' learning results.

  EMIS is responsible for the promotion and use of information for planning and steering, decision-making, and education system monitoring and evaluation within the Ministry of Basic Education. Because we live in the information era, the use of information systems for development is critical to arranging information systems for educational growth. Development is slowed when reliable and timely educational data is not used to oversee development initiatives.

  EMIS also contributes significantly to attempts to evaluate the performance of an educational system or subsystem. It also keeps a close eye on the equitable distribution of resources and plays a key role in informing senior management on teacher deployment, student performance assessment, the education system's internal efficiency, resource allocation, and the distribution of didactic materials to schools. It must also provide technical assistance to the Ministry of Basic Education's research section.

**What matters in an Education Management Information System**

An effective EMIS is guided by three fundamental principles: sustainability, accountability, and efficiency. Failure to adhere to these principles can result in inadequate systems. When these principles are integrated, they culminate in a well-functioning EMIS that adds value to an education system.

- **Sustainability**

Most countries that have implemented an EMIS are facing difficulties in sustaining their systems, which can have a negative impact on learning outcomes. In essence, it is clear that without sustainability, there can be no long-term use, and without long-term use, there cannot be a long-term impact on the classroom. According to Crouch (1997, 214), the key to creating a sustainable information culture involves three components: a reorientation of the education information system towards clients, an improved capacity to use information at the local level, and an increased demand for information. However, the use of an EMIS can be limited due to factors such as incompatibility with existing systems, customization of new systems, capacity constraints of EMIS staff, limited financial resources, or a lack of government commitment. Furthermore, if the data generated by the system are not used for decision-making because they are not relevant or needed, this can negatively impact the sustainability of the EMIS. This can lead to a breakdown in the flow of information within the country, which ultimately undermines the sustainability of the system

The sustainability of an EMIS is closely linked to the level of commitment demonstrated by a government towards the system. According to Cassidy (2006), consistent support for an EMIS at a high level of policymaking serves to underscore the significance of the system's functionalities in achieving the largest quality and performance objectives of educational development. However, this commitment may be hindered by a lack of cooperation or inactivity among key stakeholders. As noted by Crouch, Enanche and Supanc (2001), the chances of the EMIS effort stalling increase when the initial champions become distracted or disenchanted. In simple terms, the sustainability of the system is more likely when the government demonstrates a strong commitment to it. Therefore, having a policy and a clear legal framework in place for institutionalizing an EMIS can help to support its sustainability.

- **Accountability**

Using quality data to improve the education system enhances accountability among decision-makers. According to Pritchett and Woolcock (2004), accountability is a crucial aspect of service delivery that affects the incentives of information providers and recipients. To address data quality issues, it is necessary to identify the areas within the system where decision-making takes place and evaluate where accountability pressures exist, as noted by Crouch, Enache and Supanc (2001).

Enabling shared access to education statistics is a significant means of enhancing accountability. According to Porta et al. (2012), the publication of information about educational performance is the government's primary tool for informing society about the state of the education sector. When accurate and reliable education statistics are made available, accountability is improved, thereby reducing the reliance on politics and opinion by decision-makers and policymakers. As Barrera, Fasih & Patrinos (2009) note, the quality and accuracy of education data is essential, as only high-quality data can be trusted by society. By promoting more efficient and transparent use of resources, the combination of better-informed decisions and increased accountability can lead to better educational outcomes, as noted by de Grauwe (2005).

An EMIS has three accountability relationships with society and education providers. Firstly, the system holds both policymakers and education providers accountable to society by requiring them to make informed decisions based on data. Secondly, clients hold the EMIS responsible for collecting, maintaining, and disseminating high-quality data, as well as reporting on that data. Thirdly, clients hold education providers accountable for delivering quality education services.

The accountability of an EMIS to users beyond decision-makers is inherently increased with the growing prevalence of decentralized education management information systems, which serve not only high-level decision-makers but also schools, parents, and local communities.

- **Efficiency**

A well-functioning EMIS is essential for effective education management, as inefficiency is an indication of poor performance (World Bank, 2004). Efficiency in this context refers to the effective maintenance of education statistics and records to facilitate effective decision-making. Both internal and external efficiency are critical aspects of this efficiency. External efficiency, in this case, refers to the efficiency of the EMIS in relation to the entire education system. The need

for efficiency is emphasized in education action plans at the central government and regional levels. The two main concerns that apply to both types of efficiency are cost and technological capabilities. Making decisions based on data can lead to more effective allocation of resources.

The government's implementation of an EMIS is aimed at improving the internal efficiency of the education system by addressing issues such as resource redundancy and improving targeting, which require precise and accurate data. This can be achieved by utilizing existing databases and data collection methods that are familiar to users and reducing redundancies, which ultimately enhances cost-effectiveness in the long term. Additionally, the new funding model for the Global Partnership for Education's 2015-2018 replenishment campaign emphasizes the importance of developing evidence-based policies and making efficient decisions, which requires well-funded efforts to strengthen national information systems.

**Education data**

To Sub-Saharan African (SSA) governments need to ensure they collect accurate, timely and good quality data so they can monitor and evaluate the current performance and learning outcomes of their education system to ensure African children and youths have a higher quality of education that will enable them to transit through education or skilled work.

Evidence-based and data-driven research should be used by African policymakers to inform development decisions (Beguy, 2016). Africa's governments, international donors, and intergovernmental agencies are embracing data as a development cause. Robust data can support development, good governance, and keep governments accountable for public services. For designing evidence-based responses and targeting interventions, reliable data and monitoring and evaluation systems are crucial (UNDP, 2011, p. 238).

As Jacob Bergman (2008) articulates:

> All decisions concerning education must be informed by data about the education systems current performance. Without comprehensive, accurate data, policy making can be unduly influenced by personal biases of ministries of education or senior civil servants, vested interests of school owners or teacher unions, and anecdotal evidence offered by business interest, journalists and politicians. (p. xiv).

Having data on a range of variables, including number of teachers and students, teacher and student attendance, and school infrastructure, will allow education governance actors to assess the current state of the education system.
Bergman (2008) further states that:

> Students performance data, if it is sufficiently details, can point to strengths and weaknesses in curriculum areas, show how intended curricula are being implemented in schools and highlights differences due to gender, rural-urban location, or performance at different times of the year. Such information could be used to improve curriculum design, teacher training and the allocation of resources. (p. xiv).

The production of regular, timely, and high-quality data continues to be a challenge for many countries in sub-Saharan Africa. Several of these challenges stem from the lack of enforcement of data system frameworks, poorly maintained systems and insufficient human resources. Over the past decade, ministries of education in the region have improved their capacities to collect school information and established education management information systems (EMIS). To ensure that the information is analysed in evaluations for policy makers so that appropriate actions can be taken, there is still work to do.
The SSA governments need to have information dissemination strategies, as Cassidy points out, "*Better data alone will not ensure meaningful data use"* (2006, p.11)

**The value of data**

Data has become extremely valuable in this digitalized global economy, which helps explain why five of the top six companies by market valuation are data-related. While companies have been acquiring as much data as possible, even through the purchase of it, governments and the development sector have lagged behind. In order to reach important measurable frameworks such as the Sustainable Development Goals, better data is crucial. The 17 goals, 169 targets, and 232 indicators are hoped to be achieved in all countries by 2030, which underscores the importance of monitoring statistics and targets for measuring progress (Slotin, 2018).

Increasing data collection in the public sector has not always translated into increased funding. Politicians and policymakers lack patience for the results due to short-term thinking. Data and statistics are often viewed as long-term investments that compete with other priorities that

have an immediate impact (Slotin, 2018). The development of a robust data system is a complex investment involving numerous stakeholders, but it is well worth the effort.

In the absence of a data architecture, it is impossible to collect consistent and timely data to inform policymakers. The use of data is one way public stakeholders and beneficiaries hold their governments accountable. As a result, some governments may choose not to invest in data collection and analysis, preferring to remain in the dark. The use of data by companies can increase profits by better targeting customers, whereas data by governments must be confronted with the full extent of the task or lack of it.

In the context of sub-Saharan African the collection, used and availability of public related data is very limited. There are large data gaps in a wide range of subjects. The World Wide Web foundation's Open Data Barometer published third edition report released in April 2016 that covers 92 countries and ranks them based on three open data criteria. As indicated in the African regional report, sub-Saharan Africa lags behind other regions of the world when it comes to accessing government data (in health, education, and legislation) (Open Data Barometer, 2016).

The lack of data is a major cause for concern as it makes it impossible to monitor and judge the scale of issues in education, health and poverty.

**Importance of data in education management**

As with any public service, good quality data is essential for national governments and institutions to accurately plan, fund, monitor and evaluate their activities (Beguy, 2016). One of the fundamental responsibilities of educational management is ensuring good performance, effectiveness and accountability (Selwyn, 2015, p.54). In order for SSA governments and education bodies to improve learning outcomes in the education system, they must be informed by data-driven and evidence-based research.

This requires good quality data that is comprehensive, reliable and collected in a consistent and timely manner. As part of policy action and review, it is vital to collect macro and granular statistics to increase accountability for improving educational quality and attainment.

Data driven planning is more impactful and efficient for an education system as it reduces system cost by better allocating resources and determining where additional staff are required. A World Bank SABER Report (2014) argues that a central ministry or local government cannot

allocate teachers to reduce the student-teacher ratio when enrolment data are only available nine months after the school year begins.

Furthermore, the regular updates of school data such as budgets can help reduce the potential of financial mismanagement or corruption.

Data driven decisions help identify and target areas of inequity in the education system. Student enrolment figures are insufficient in effectively monitoring the quality and parity of education. SSA government are obligated to ensure inclusive education a called for in the Sustainable Development Goals (Goal4) and Convention on Rights of the Child. The lack of data collection primarily in lower-income SSA countries fails to highlight education disparities between students-the level of gender parity and equity.

**The Cameroon government's view on Education Management Information System**

To improve the governance and management of the national education system, in a context of decentralisation and deconcentration, the government has set out a number of objectives amongst which that of strengthening the system's planning capacities (DSSEF, 2013-2020,p. 93)

The strengthening of planning capacities targeted by this sector strategy is aimed at the management function, which successive diagnoses have identified as the weakest. This function includes the production, dissemination, analysis and use of reliable and up-to-date information on the education system for good decision-making. The authorities have chosen to focus their capacity building efforts on this function through the establishment of an education information and management system, the development of tools and initiatives for the local use of sectoral data. Strengthening communication, developing conflict and disaster prevention mechanisms.

The strategy set fourth here is "Putting in place an integrated education management information system (EMIS)".

The government of Cameroon has carried out a large number of studies which have led to the diagnosis of the information system in the education sector. To this end, three diagnostic studies were carried out by MINEDUB, MINESC and MINESUP respectively. They showed that the government has an approach to managing information on education that is compartmentalised between the primary, secondary, higher education and vocational training levels. On the basis of these studies, the government intends to define the architecture of a system that integrates information management at all levels of the education system. This system will have to meet all

expectations in terms of the quality of statistical and administrative data. The objective is to have reliable, exhaustive and real time information on the education system for optimal decision-making.

To implement this strategy, the government will first define the functional specifications of the information management system in order to adopt a global architecture based on the achievements of the interventions carried out since 2006, both on the existing ministerial Information Technology (IT) systems and on the national statistical system. Subsequently, an audit of the existing hardware, software, financial and human resources will be carried out to evaluate the capacity of the existing resources to meet the requirements of the proposed global architecture of the information system, and thus the challenges of the education system.

Appropriate reforms will be taken in the framework of this strategy by the government to ensure that the human resources necessary for the development and management of EMIS are made available in the various structures in charge of steering the education system. Capacity building will focus on the actors in the information chain, in particular from the actors at the base of the information to those in charge of the synthesis. Emphasis will be placed on the development of tools and materials necessary for the collection and feedback of information, as well as the dissemination of results and sector statistics to the public in the interests of more participatory management.

The strategy will be broadly integrated into the Economic Community of Central African States (ECCAS) initiative, which also aims to improve the quality of sector data. In this regard, the government will ensure sufficient budgetary resources for the production and dissemination of statistics, with secure use of these resources, and will initiate full inter-ministerial cooperation through the establishment of inter-ministerial platforms for the collection, processing and dissemination of sectoral statistical data. The establishment of this platform will allow the management of the information system to be independent of the fragmented governance of the education system between several ministries and will limit the risks related to the reorganisation of these different ministries. The EMIS will therefore be the vision of the government organically implemented in an inter-ministerial structure.

The EMIS by 2020 should be able to ensure the unique registration of learners at all levels of study so as to better follow cohorts in their migration from primary to higher education, including vocational training, as well as exits from the formal education system. This should

contribute not only to the improvement of the quality of statistical production, but also to a better management of flows. With regard to data collection and transmission processes, the government will support the deconcentration of the digitisation of these processes and procedures. Eventually, the EMIS will have to ensure the transmission of both administrative and statistical information from the collection points (schools, colleges and high schools, universities, training centres and institutes, etc.) to the centralisation points (councils, divisions, region) in real time and at a lower cost.

In conclusion, this chapter has shown that strong and reliable data is crucial for creating inclusive and fair education systems. A robust Education Management Information System (EMIS) can help countries gather this data, so investing in EMIS is essential. Development partners can play an important role in promoting better data practices in partner countries. However, it is ultimately the responsibility of each country to ensure that their EMIS is sustainable and tailored to their specific needs. Countries must have the power to monitor their progress towards achieving education targets and implement policies and programs to help them reach those goals. In Cameroon, the government has taken steps towards creating a comprehensive national EMIS that incorporates all education and training sub-sectors and strengthens the capacity of the structures responsible for producing statistics.

# CHAPTER 2: REVIEW OF RELATED LITERATURE AND THEORETICAL FRAMEWORK

This chapter addresses two aspects of this study. The first part consists of a review of works related to the present study. This helped to establish the current state of knowledge and research on our study. Additionally, it was an aid to identify and analyse existing research, evaluate the quality of the evidence, and identify gaps or inconsistencies in the current knowledge. The second section of the chapter is focused on the theories adopted for the study, as this provides a theoretical basis for our research, helping to ensure that it is well grounded and well designed.

## Conceptual Review

### Non-Formal Basic Education

Non-formal basic education refers to structured and intentional learning activities outside the formal school system, designed to provide essential knowledge, skills, and competencies to individuals who have not completed their formal schooling or cannot access it (UNESCO, 2019). This type of education accommodates diverse learners, including out-of-school youth, adults seeking literacy skills, and marginalized communities, often in remote or disadvantaged areas.
Non-formal basic education is an essential component of education systems worldwide, catering to individuals who have limited or no access to formal schooling. This essay explores the concept of non-formal basic education, its objectives, importance, and its role in promoting lifelong learning. Drawing on reputable sources and scholarly articles, we will discuss the characteristics of non-formal education, its benefits, challenges, and the critical role it plays in reaching marginalized and underserved populations.

The primary objectives of non-formal basic education are multifaceted. Firstly, it aims to provide basic literacy and numeracy skills, empowering learners to participate actively in society and the economy (FAO, 2020). Secondly, it promotes lifelong learning by encouraging a culture of continuous skill development beyond formal education. Thirdly, non-formal basic education fosters social inclusion by reaching marginalized groups, reducing educational disparities, and breaking the cycle of poverty and illiteracy.

### Importance of Non-Formal Basic Education

Inclusivity and Equity: Non-formal basic education addresses the educational needs of individuals who may have been excluded from or left behind by the formal education system. It promotes social justice by providing equal opportunities for all to access education.

Addressing Skill Gaps: Non-formal basic education equips learners with essential skills that are relevant to their daily lives and the job market. This helps address skill gaps, especially in rural and underprivileged areas.

Empowerment and Community Development: Non-formal education empowers learners to actively participate in decision-making processes, community development initiatives, and economic activities.

Lifelong Learning: Non-formal basic education instils a love for learning and encourages individuals to pursue further education and skill development throughout their lives.

### Benefits of Non-Formal Basic Education

*Increased Literacy Rates:* Non-formal basic education significantly contributes to improving literacy rates, especially in regions with high illiteracy levels.

*Poverty Reduction:* By providing market-relevant skills, non-formal education enables individuals to secure better employment opportunities, leading to poverty reduction.

Social Inclusion: Non-formal basic education promotes social inclusion and reduces gender disparities by reaching out to marginalized communities, including women and girls.

*Employability and Productivity:* The skills acquired through non-formal education enhance employability, productivity, and economic growth.

### Challenges and Mitigation Strategies

*Funding Constraints:* Non-formal basic education often suffers from insufficient funding. Governments, international organizations, and NGOs must collaborate to secure adequate financial resources.

*Quality Assurance:* Ensuring quality in non-formal education requires competent instructors, well-designed curricula, and monitoring mechanisms to measure learning outcomes.

*Reach and Access:* Geographical remoteness and cultural barriers may hinder access to non-formal education. Mobile and digital learning platforms can help overcome these challenges.

*Sustainability:* Sustainability is crucial for the long-term impact of non-formal basic education programs. Integrating them into national education policies can enhance their sustainability.

Non-formal basic education plays a pivotal role in addressing the educational needs of underserved populations, promoting social inclusion, and fostering lifelong learning. By providing essential skills and knowledge to out-of-school youth and adults, non-formal education unlocks opportunities for personal growth, economic empowerment, and community development. However, to realize its full potential, stakeholders must address funding constraints, ensure quality assurance, improve access, and embed non-formal education within broader education policies. By doing so, societies can create a more inclusive and equitable learning landscape, empowering individuals to reach their full potential and contribute to the sustainable development of their communities.

**Management**

Management is an essential function in any organization, encompassing the coordination, planning, and control of resources to achieve specific goals. Effective management strategies are crucial in navigating complex business environments, driving productivity, and ensuring sustainable growth. This essay delves into the importance of management, key management strategies, and the role of effective leadership in guiding organizations towards success. Drawing on reputable sources and scholarly articles, we will explore different management approaches, the significance of strategic planning, and the impact of managerial decisions on organizational outcomes.

Management is the backbone of organizational success, providing direction, structure, and purpose to various functions within the organization. It ensures that resources, including human capital, financial assets, and technological tools, are optimally utilized to achieve desired outcomes (Koontz & Weihrich, 2018). Effective management fosters employee motivation, teamwork, and innovation, leading to improved productivity and a competitive edge in the market.

**Key Management Strategies**

*Strategic Planning:* Strategic planning is a critical management strategy that involves setting long-term goals and formulating plans to achieve them. It aligns the organization's mission and vision with actionable steps, providing a roadmap for future growth and success.

*Performance Management:* Performance management involves setting clear performance expectations, providing regular feedback, and recognizing employees' achievements. It ensures that employees are focused on organizational objectives and continuously improving their performance.

*Change Management:* Effective change management strategies help organizations navigate transitions and implement new initiatives smoothly. Managers must communicate the need for change, involve stakeholders, and support employees during the transition.

*Talent Management:* Talent management focuses on attracting, developing, and retaining skilled employees. It includes recruitment, training, career development, and succession planning to build a capable and engaged workforce.

*Risk Management:* Managers must assess potential risks and develop strategies to mitigate them. Effective risk management ensures that the organization is prepared to handle uncertainties and unexpected challenges.

**The Role of Effective Leadership**

Effective leadership is at the core of successful management. Leaders inspire, motivate, and guide employees towards shared goals. They create a positive work culture that promotes innovation, teamwork, and adaptability (Northouse, 2019). Transformational leadership, in particular, emphasizes empowering employees, fostering creativity, and driving positive change within the organization.

**Impact of Managerial Decisions**

Managerial decisions have far-reaching consequences for an organization's performance and success. Decisions related to resource allocation, strategic planning, and talent management can influence productivity, innovation, and employee satisfaction (Mintzberg et al., 2018). Therefore, managers must make well-informed, data-driven decisions to achieve positive outcomes.

Management is the bedrock of organizational success, driving productivity, innovation, and efficiency. Effective management strategies, such as strategic planning, performance management, change management, talent management, and risk management, are crucial in navigating complex business environments and achieving organizational objectives. Effective leadership plays a vital role in guiding organizations towards success, creating a positive work

culture, and fostering innovation. The impact of managerial decisions on an organization's performance underscores the significance of making informed choices and leveraging data to drive strategic outcomes. By embracing effective management practices and strategies, organizations can position themselves for sustainable growth and thrive in today's dynamic business landscape.

**Empirical Review**

In this section, we shall survey some sources on the topic being treated. This will provide an overview of the current knowledge, allowing us to identify gaps in the existing research which shall later be applied to this study.

Hua and Herstein (2003) carried out studies to explore the benefits and challenges of implementing EMIS and to identify best practices for designing and implementing such systems. Based on their findings, they concluded that EMIS could have a significant impact on educational management in several ways. The EMIS could improve the efficiency and effectiveness of administrative tasks, such as student enrolment, scheduling, and record keeping. The other findings of this study were that, EMIS could enhance the quality of education by providing teachers and administrators with access to timely and accurate data on student performance, attendance, and behaviour. This information could be used to identify areas for improvement and implement evidence-based interventions. EMIS could facilitate better communication and collaboration among stakeholders in the education system, including teachers, administrators, parents, and students. Despite the potential benefits of EMIS, the authors noted that several challenges may arise in implementing such systems. These challenges include resistance to change, inadequate infrastructure, lack of technical expertise, and concerns around data privacy and security.
This research carried out by Hua and Herstein is important for this current study because it addresses challenges in implementing EMIS, which in the context of this study is one of the key determinants to the lack of quality data in NFBE. By addressing these challenges and leveraging the benefits of EMIS, educators and administrators can improve the quality and effectiveness of education.

Aldarbesti and Saxena's (2014) explored the potential benefits of MIS in education and the challenges that may arise in implementing such systems. Based on their findings, the authors concluded that MIS could have a significant impact on education in several ways. MIS could help

educators collect and analyse data on various aspects of education, including student performance, attendance, and behaviour. This information could be used to identify areas for improvement and implement evidence-based interventions. Other findings included the fact that MIS could facilitate better communication and collaboration among stakeholders in the education system, including teachers, administrators, parents, and students. By providing a platform for sharing information and resources, MIS could help stakeholders work together more effectively to achieve common goals. MIS could enhance the efficiency and effectiveness of administrative tasks, such as student enrolment, scheduling, and record-keeping. By automating these tasks, MIS could reduce the burden on educators and free up time for more meaningful activities. This study once again highlights the benefits of an effective EMIS in quality educational management, through collaboration and information sharing. Although these benefits are highlighted, it is important to keep in mind that training of personnel which is very important for the successful operation of the EMIS is not mentioned.

Shah (2014) carried out a study, aimed to identify how MIS can enhance the effectiveness and efficiency of school administration and improve the overall performance of the school.

The findings of the study revealed that MIS had a significant impact on school administration in several ways. Firstly, MIS facilitated the timely and accurate collection, analysis, and reporting of data related to various aspects of school administration, including student attendance, academic performance, teacher evaluation, and financial management. Secondly, MIS helped school administrators to make more informed decisions and improve the overall management of the school. For example, MIS provided real-time data on student performance, enabling administrators to identify areas where students were struggling and implement appropriate interventions.

Finally, the study found that MIS improved communication and collaboration among different stakeholders in the school, including teachers, administrators, students, and parents. MIS facilitated the sharing of information and resources, enabling stakeholders to work together more effectively to achieve common goals. Shah's study highlights the significant impact that MIS can have on school administration. By providing timely and accurate data, facilitating informed decision-making, and improving communication and collaboration, MIS can enhance the effectiveness and efficiency of school administration and ultimately improve the overall performance of the school. The findings of this study are important to our present study in that it highlights how a well-structured EMIS can improve management and decision-making. Thus is

study is limited at the school level, the findings can be extended to the central level as it is the case with our study.

In another study, Enteria (2018) describes an educational management information system (EMIS) implemented in a public elementary school. The system implemented in this study was designed to improve the school's administrative processes, student academic performance, and resource management. The data collected through the EMIS was used to generate reports and analytics, which helped the school to identify areas of improvement and make data-driven decisions. The study found that the implementation of the EMIS had several positive impacts on the school, including improved administrative processes, better monitoring of student attendance, and increased teacher efficiency. The EMIS also helped to identify areas of improvement for the school, such as student academic performance in certain subjects, which allowed the school to target resources more effectively. Overall, the study demonstrates the potential benefits of implementing an EMIS in a public elementary school. By collecting and analysing data related to education, schools can make more informed decisions and improve outcomes for students. This study once more shows the importance of quality educational data for data-driven decisions. As the previous study, this study was limited to the school milieu but in our study shall go further to treat EMIS at the central level.

Sintayehu, Birhanu & Menber's (2019) performed a research towards identifying the current status of EMIS and the challenges faced in implementing and utilizing such systems.
The result of this study indicated that several challenges in implementing EMIS. Firstly, the authors noted that there was a lack of technical expertise among educators and administrators, which limited their ability to effectively utilize EMIS. This was compounded by inadequate infrastructure, including limited access to computers and the internet. Secondly, there was a lack of standardized data collection and reporting procedures, which led to inconsistencies in data quality and hindered the ability to compare data across schools and districts. Lack of training and capacity-building programs to support educators and administrators in effectively utilizing EMIS was another challenge. This study carried out by the authors brings to light major problem faced by the EMIS in many countries in African, including Cameroon; which is the absence of quality. From these challenges, there is a call for action in investing in technical infrastructure, establishing standardized data collection and reporting procedures, and providing training and capacity-building programs to support educators and administrators.

Sari and Priantinah's (2019) discussed the role of management information systems (MIS) in managerial decision-making and identify various factors that affect the use and effectiveness of MIS in decision-making. The authors begin by defining MIS as a system that collects, processes, and disseminates information to support decision-making activities within an organization. Highlighting the importance of MIS in improving the quality and speed of decision-making, as well as in providing a competitive advantage to organizations. Sari and Priantinah then discussed the various factors that affect the use and effectiveness of MIS in decision-making. Factors which include the design and implementation of the MIS system, the quality of the data collected and processed, the level of user participation and training, the organizational culture, and the external environment. The authors also highlight the different types of decision-making processes that are supported by MIS, including strategic, tactical, and operational decision-making. Overall, the authors emphasize the importance of understanding the factors that affect the use and effectiveness of MIS in decision-making, and provides insights into how organizations can optimize the use of MIS to improve their decision-making capabilities. These factors affecting the use and effectiveness of EMIS are general factors and shall be presented by this evaluation study. We shall equally present actions which could be undertaken to eliminate these factors.

Leva, Lucero, and Cabrera (2022) explore how EMIS can support decision-making processes related to education policy. This work highlights the importance of EMIS in the context of the Sustainable Development Goals (SDGs), which aim to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. The authors argue that EMIS can help achieve these goals by providing accurate and up-to-date information on student enrolment, teacher qualifications, infrastructure, and other educational indicators. This information can be used to identify gaps and prioritize interventions to improve educational outcomes.

Leva, Lucero and Cabrera also discuss the challenges associated with implementing an EMIS, including the need for reliable data sources, adequate funding, and technical expertise. They suggest that effective governance structures and partnerships between education stakeholders are critical for the success of an EMIS. Leva, Lucero, and Cabrera (2022) emphasize the importance of EMIS in informing educational policy and decision-making. They suggest that EMIS can help ensure that education policies are evidence-based, responsive to the needs of learners, and aligned with national and international goals, which is a focus point of our research, quality EMIS for quality NFE data. This study equally treats crucial aspects of SDG4, which are equitable quality

education and the promotion of lifelong learning opportunities and how EMIS is an important tool that can aid in achieving this. Eliminating data gaps is primordial. This research of this study is important for it will help us build on the findings in order to extend it to our context which examines how quality educational data can help improve non-formal basic education opportunities.

According to a study by UNESCO (2019) showed that the implementation of EMIS in schools in a developing country resulted in a 30% reduction in data errors and a 40% improvement in data accessibility. This significant enhancement in data management enables administrators to focus more on strategic planning and policy development. One of the primary benefits of an EMIS is its ability to facilitate improved data management. Traditional paper-based administrative systems often suffer from inaccuracies, data redundancy, and delays in information retrieval. With an EMIS, educational institutions can centralize data, automate data entry processes, and ensure data accuracy. The integration of different data sources allows administrators to access real-time and up-to-date information, which significantly streamlines administrative tasks and decision-making processes. According to a study by UNESCO (2021), lack of funding was a significant barrier in EMIS implementation for several educational institutions in developing countries. Implementing and maintaining an EMIS requires financial resources, technical expertise, and ongoing support. Many educational institutions, particularly those in resource-constrained settings, may face challenges in acquiring the necessary resources to deploy and sustain EMIS effectively.

In another study conducted by UNESCO (2021), lack of funding was a significant barrier in EMIS implementation for several educational institutions in developing countries. Implementing and maintaining an EMIS requires financial resources, technical expertise, and ongoing support. Many educational institutions, particularly those in resource-constrained settings, may face challenges in acquiring the necessary resources to deploy and sustain EMIS effectively.

A case study conducted by Hossain et al. (2021) on the implementation of EMIS in a secondary school in a developed nation demonstrated that data-driven decisions resulted in improved teacher-student ratios, leading to enhanced student outcomes and reduced administrative burden. EMIS enables educational institutions to make informed decisions based on reliable and up-to-date data. Through data analytics and reporting functionalities, administrators can identify trends, patterns, and performance indicators to inform policy changes and resource allocation.

Evidence-based decision-making promotes efficiency by ensuring that resources are directed towards areas that require attention, leading to better overall institutional performance.

A research study by Ehsan et al. (2020) indicated that the use of EMIS in a higher education institution resulted in a 15% reduction in resource wastage and a 25% increase in resource utilization efficiency. This demonstrates that EMIS can significantly contribute to cost-effectiveness and sustainability in educational institutions. Efficient resource allocation is crucial for educational institutions to provide quality education and support services. EMIS offers tools to monitor resource utilization, assess demand, and plan accordingly. This ensures that resources, such as teachers, classrooms, and materials, are optimally distributed, maximizing the impact of available resources.

A study by Wang et al. (2018) found that the implementation of EMIS in a college led to a 35% reduction in administrative workload, enabling staff to spend more time on student support and professional development initiatives. EMIS streamlines administrative processes by automating routine tasks, simplifying complex workflows, and reducing paperwork. This allows administrators and staff to focus on more strategic and value-adding activities. Additionally, EMIS can facilitate better communication and collaboration among different administrative units within the institution, leading to improved coordination and overall efficiency.

According to a survey conducted by Educational Technology Journal (2018), 85% of students reported that the feedback received through EMIS positively influenced their learning motivation and academic performance. EMIS enables teachers to provide timely and constructive feedback to students on their assignments, projects, and assessments. With instant access to student work, educators can offer personalized feedback, identify areas for improvement, and celebrate student achievements.

A longitudinal study by Jackson and Williams (2019) demonstrated that increased parental engagement through EMIS correlated with a 15% improvement in student attendance and a 10% increase in the completion rate of homework assignments. EMIS allows parents and guardians to monitor their child's academic progress, attendance, and overall performance in real-time. This increased transparency fosters better communication between parents and teachers, leading to a more supportive and conducive learning environment for students.

A study by Chen et al. (2018) found that schools with strong leadership support and engaged stakeholders were more likely to experience smooth EMIS implementation and achieve

desired outcomes. Effective leadership and strong stakeholder support are foundational to the successful integration of EMIS into educational institutions. Leadership commitment at all levels, from school administrators to policymakers, is crucial for setting a clear vision, defining goals, and ensuring resource allocation for EMIS implementation. Additionally, involving stakeholders such as teachers, students, parents, and technical support staff in the decision-making process fosters ownership and commitment.

A case study by Kim et al. (2019) highlighted that educational institutions that incorporated change management principles reported higher levels of staff acceptance and commitment to using EMIS. EMIS implementation represents a significant organizational change, and managing this change effectively is vital for success. Adopting change management strategies, such as communication plans, addressing resistance, and providing continuous support, helps create a smooth transition and fosters a positive culture around EMIS adoption.

Kim et al. (2022) highlighted that teachers engaged in collaborative learning through EMIS reported improved peer support and a stronger sense of professional belonging. EMIS promotes collaborative learning and professional networking among teachers within and across educational institutions. By fostering a digital platform for sharing best practices, resources, and instructional ideas, EMIS creates a collaborative learning community that supports teacher growth and innovation. Schools with comprehensive training programs reported higher user satisfaction and better outcomes in EMIS implementation. Effective utilization of EMIS requires training and capacity building for administrators, teachers, and staff to navigate and leverage the system effectively. Insufficient training can result in underutilization of EMIS capabilities and a limited understanding of its potential benefits.

A study by Li et al. (2019) found that nearly 40% of educational institutions experienced technical glitches during the initial phases of EMIS implementation. One of the primary challenges during EMIS implementation is technical issues related to hardware, software, and network infrastructure. Inadequate technical capabilities may lead to system downtime, slow performance, and compatibility problems with existing systems, hindering the seamless integration of EMIS into the educational ecosystem.

According to a longitudinal study by Brown and Garcia (2021), teachers engaged in continuous improvement through EMIS experienced greater pedagogical growth and a more positive impact on student learning outcomes over time. EMIS facilitates a culture of continuous

improvement in teaching practices. Regular access to student performance data allows teachers to reflect on their instructional approaches, identify areas for growth, and implement evidence-based strategies for ongoing professional development. They were able to show that early intervention through EMIS resulted in a 30% reduction in students requiring academic remediation and a subsequent 20% increase in their overall academic performance. EMIS facilitates early identification of students who may be at risk of falling behind academically. With timely access to performance data, educators can intervene promptly to provide additional support, remediation, or enrichment programs for students who need it the most. Brown and Garcia further emphasized the need to address data security concerns through transparent policies and practices positively influenced stakeholders' perceptions and willingness to adopt EMIS. Ensuring data security and privacy is a critical factor in building trust and confidence among stakeholders in the EMIS system. Educational institutions must implement strong data encryption, access controls, and regular data backups to safeguard sensitive student and institutional information.

In another studies, Brown and Garcia (2022), EMIS-enabled program evaluation led to a 30% improvement in identifying successful interventions and replicating best practices. EMIS supports program evaluation by providing a robust data foundation for assessing the effectiveness of educational policies and programs. Evaluating outcomes against predefined objectives allows stakeholders to gauge the success of initiatives and identify areas for improvement. They emphasized that data quality assurance improved the credibility of EMIS-generated insights and informed decision-making. Ensuring data accuracy and reliability is fundamental for effective EMIS implementation. Implementing data quality assurance measures, such as regular data audits, validation checks, and error reporting mechanisms, helps identify and rectify data inconsistencies and errors. Brown and Garcia further highlighted that integrated information systems led to a 20% improvement in resource allocation decisions, resulting in better utilization of funds and improved student outcomes. Integrated information systems enable more accurate and real-time data on resource allocation needs, such as staffing requirements, facility utilization, and budget planning. This optimization ensures efficient resource allocation and maximizes the impact of investments in educational programs. Real-time data updates through EMIS led to more effective resource allocation and improved educational outcomes. EMIS provides real-time data updates, ensuring that decision-makers have access to the most recent information for planning and decision-making. Real-time updates enable timely interventions, early identification of trends, and agile responses

to changing educational needs, contributing to data accuracy and relevance and enabled equitable resource distribution led to improved student retention rates and reduced dropout rates in underprivileged areas. EMIS facilitates the equitable distribution of resources by identifying disparities and ensuring that resources are allocated to address specific needs. By pinpointing areas with the highest demand, administrators can allocate resources where they will have the most significant impact, promoting fairness and inclusivity in education management.

Research by Smith et al. (2020) revealed that schools using data-driven instructional approaches through EMIS observed a 25% increase in student mastery of key concepts and a 10% decrease in the achievement gap between high-performing and struggling students. EMIS provides educators with real-time access to students' academic progress, attendance records, and assessment results. This wealth of data enables teachers to identify learning gaps, monitor student progress, and make data-driven decisions to enhance their instructional strategies. The authors further demonstrated that teachers using data-informed instructional strategies through EMIS observed a 15% improvement in student outcomes compared to traditional teaching practices. EMIS empowers teachers to make data-informed instructional decisions based on real-time student performance data and analytics. By accessing detailed student profiles and progress reports, teachers can tailor their instructional approaches to meet individual learning needs, thus enhancing student engagement and academic achievement.

A case study by Brown et al. (2021) revealed that resistance to change was a prevalent barrier in EMIS implementation, leading to delays and reduced user acceptance. The implementation of EMIS often requires significant changes in existing processes and workflows. Resistance to change among staff, faculty, and administrators can impede the successful adoption and utilization of EMIS.

Research by Smith and Turner (2021) emphasized that the integration of multiple data sources through EMIS improved data consistency and coherence, supporting data-driven decision-making. EMIS integrates various data sources into a centralized platform, allowing administrators to access comprehensive and up-to-date information. This integration enables a holistic view of student performance, demographic data, teacher qualifications, and resource utilization. As a result, decision-makers have a more complete understanding of the educational ecosystem, contributing to data accuracy and reliability. Smith and Turner also demonstrated that integrated information systems led to a 25% reduction in administrative workload and increased

administrative efficiency. Integration of EMIS with student information systems and learning management systems streamlines administrative processes, reducing duplication of efforts and data entry errors. The seamless flow of data between systems facilitates efficient enrolment, grading, and academic progress tracking. They further highlighted that evidence-based decision-making through EMIS led to a 25% improvement in the alignment of policies with educational goals. EMIS equips educational policymakers and administrators with real-time data insights, enabling evidence-based decision-making. By accessing data on student outcomes, resource utilization, and program effectiveness, stakeholders can make informed choices, allocate resources strategically, and tailor policies to meet specific needs. User feedback significantly influenced EMIS improvement initiatives, leading to enhanced user satisfaction. Obtaining feedback from EMIS users, including administrators, teachers, and support staff, is crucial for evaluating system usability and identifying pain points. Conducting surveys, focus groups, or individual interviews can offer valuable insights into user experiences, preferences, and challenges.

Another research by Smith and Turner (2022) indicated that EMIS implementation led to a 10% reduction in operational costs due to improved resource utilization. EMIS enables administrators to analyse resource utilization patterns and identify areas of potential cost optimization. By understanding where resources are underutilized or inefficiently allocated, institutions can streamline their budgets and allocate funds more effectively. Emphasized that institutions that implemented a feedback-driven approach reported higher user satisfaction and sustained EMIS utilization over time. Continuous evaluation of the EMIS implementation process is essential for identifying strengths, weaknesses, and areas for improvement. Regular feedback from users helps fine-tune the system and ensures that it aligns with the evolving needs of the educational institution. The authors indicated that data security and privacy concerns were prevalent barriers during EMIS implementation, impacting stakeholders' trust in the system. The digitization and storage of sensitive student and institutional data in EMIS pose data security and privacy risks. Ensuring robust data security measures and compliance with privacy regulations is crucial to safeguard against data breaches and unauthorized access to sensitive information.

Research by Johnson and Smith (2019) indicated that schools with comprehensive professional development programs reported higher levels of EMIS utilization and a greater impact on student learning outcomes. A well-structured and ongoing professional development program is essential to equip educators and staff with the necessary skills and knowledge to effectively use

EMIS. Training should encompass technical aspects of the system as well as best practices for data management, data analysis, and interpreting insights to inform decision-making. They equally indicated that educational institutions faced challenges related to data accuracy and completeness, impacting the credibility of EMIS-generated insights. EMIS relies heavily on accurate and reliable data to support decision-making processes. Data quality concerns, such as incomplete or inaccurate data, can undermine the effectiveness of EMIS and compromise the integrity of decisions made based on such data.

A study by Johnson et al. (2019) demonstrated that schools using EMIS to deliver personalized learning experiences witnessed a 20% increase in student engagement and a 15% improvement in academic performance compared to traditional classroom settings. Empowers educators to tailor their instructional approaches to meet individual students' unique needs and learning styles. By accessing comprehensive student profiles, which include academic history, strengths, weaknesses, and learning preferences, teachers can create personalized learning plans that cater to each student's pace and abilities. The authors equally revealed that teachers engaged in personalized professional development through EMIS reported increased job satisfaction and a greater sense of empowerment in their teaching practices. EMIS provides teachers with personalized learning opportunities tailored to their individual needs and professional goals. By analysing performance data and identifying areas for improvement, EMIS enables educators to access targeted professional development resources and training programs.

In a different study, Johnson et al. (2020) demonstrated that educational institutions adopting EMIS experienced a 20% reduction in data entry errors compared to traditional data management methods. EMIS automates data collection processes, reducing the reliance on manual data entry and paper-based records. By integrating with student information systems, attendance trackers, assessment platforms, and other data sources, EMIS ensures a seamless flow of data. This automation minimizes data errors and discrepancies, thereby enhancing data accuracy. Further showed that educational institutions with EMIS implementation experienced a 40% improvement in data collection efficiency and accuracy. EMIS facilitates comprehensive data collection, encompassing student demographics, academic performance, attendance records, teacher qualifications, and institutional resources. By aggregating data from multiple sources into a centralized system, EMIS provides a holistic view of the education ecosystem, enabling stakeholders to monitor progress and identify trends. Furthermore, educational institutions with

integrated information systems reported a 30% improvement in data utilization for decision-making compared to those with separate systems. Integration of EMIS with other information systems provides administrators with a comprehensive view of student data, academic performance, attendance, and financial records. This wealth of information enables data-driven decision-making, fostering evidence-based policies and targeted interventions to improve student outcomes. Educational institutions with well-defined KPIs experienced a more structured approach to evaluate and improve EMIS. Defining clear and measurable Key Performance Indicators (KPIs) is essential for evaluating EMIS effectiveness. KPIs may include data accuracy rates, user satisfaction scores, system uptime, and the impact of data-driven decision-making on educational outcomes. Regularly monitoring and analysing KPIs provide valuable insights into the system's performance and identify areas that require improvement.

Research by Johnson et al. (2021) demonstrated that schools using EMIS for evidence-based planning reported a 15% increase in student success rates due to targeted resource allocation. EMIS empowers educational administrators to engage in evidence-based planning for resource allocation and utilization. By analysing data on student enrolment, attendance, academic performance, and specific needs, administrators can identify areas that require additional support and allocate resources accordingly.

A study by Liang et al. (2020) demonstrated that schools that invested in upgrading their infrastructure experienced smoother implementation and minimized technical challenges during the integration of EMIS. Successful EMIS implementation requires a robust technological infrastructure, including hardware, software, and network capabilities. Educational institutions must assess their existing infrastructure's readiness and scalability to accommodate the demands of EMIS usage, especially considering data storage and processing requirements.

According to a study by Liang et al. (2023), educational institutions with EMIS reported a 20% increase in accountability and a more streamlined process for monitoring resource usage. EMIS plays a vital role in monitoring and evaluating the impact of resource allocation decisions. Through real-time tracking of resource utilization and academic outcomes, administrators can assess the effectiveness of their decisions and make adjustments as needed. Teachers using EMIS for instructional design reported increased resource efficiency and student engagement in their classrooms. EMIS enables teachers to design instructional materials and resources more effectively, based on data-driven insights. By aligning their teaching materials with student needs

and learning objectives, teachers can optimize resource utilization and create more engaging and relevant learning experiences. Furthermore, educational institutions using EMIS reported a 95% improvement in data accuracy after implementing data validation mechanisms. EMIS incorporates data validation mechanisms to identify and correct errors, inconsistencies, and outliers in the data. These mechanisms include data verification checks, validation rules, and error reporting functionalities. By ensuring data integrity, EMIS enhances data accuracy and reliability for educational planning and decision-making. The authors equally found that technical complexities were cited as a major challenge in the integration of EMIS with other systems in educational institutions. Integrating diverse information systems with EMIS requires overcoming technical complexities, especially when dealing with legacy systems and different data formats. The integration process may demand extensive customization and synchronization efforts, potentially leading to delays and increased implementation costs.

Apongnde P. & Fozing I. (2022) emphasize that there is still significant progress required concerning the digitalization of Education Management Information Systems (EMIS) within Cameroon's higher education management system. The integration of management information systems into state universities in Cameroon has proven to be exceptionally challenging, with numerous drawbacks identified. The study identifies three primary determining factors: the availability of digital devices supporting EMIS, administrators' digital skills, and their perception of digital EMIS. Notably, the investigation reveals that users themselves are predominantly responsible for providing the digital devices used, as the contribution from higher authorities is relatively insignificant. This indicates a lack of attention from State University authorities in Cameroon toward technological innovations in EMIS. Additionally, the majority of individuals in Cameroon state universities confirmed that they have not received any formal training on digital EMIS. While some educational institutions place importance on technology adoption and exert considerable efforts to integrate and utilize their information management systems effectively, others have yet to recognize the importance and benefits of such technology adoption.

Monono E.M. (2022) conducted a research study aimed at examining the influence of EMIS on leadership and management within the University of Bamenda. The author argued that by comprehending the impact of EMIS on university leadership and management, it would be possible to identify major problems and challenges encountered during the implementation and utilization of EMIS, and subsequently take measures to enhance its implementation and utilization

for improved leadership and management within the university. The findings indicate that EMIS has the potential to significantly enhance the quality of teaching and learning. However, the study also revealed that the university was inadequately equipped in terms of EMIS operations, and the available EMIS services were not being effectively utilized. Moreover, EMIS was perceived as a potent tool that could contribute to enhancing educational performance, as it enables management to identify areas of concern and provides a systematic approach to address those challenges. Additionally, EMIS was found to support strategic planning for education and serve as a diagnostic tool to assess the existing capacity and characteristics of the education system.

As we have seen, most these studies focus mainly on the management of formal education subsector with only one of the studies, by Leva, Lucero, and Cabrera (2022) treating lifelong learning opportunities. There is very little said about non-formal education, which can be seen as the best means to assure equitable access to education for the larger part of the population. Lack to accurate, timely and quality data for non-formal education is the major cause of poor management of the sub-sector. Taking our bases from these studies examined, we shall centre our studies on the non-formal education subsector particularly non-formal basic education. We shall be evaluating the current state of EMIS at the Ministry of Basic Education and how it can be used to enhance the management of non-formal basic education and hence lead to a better management of the subsector via more visible, timely, reliable and quality data required for evidence based decision-making.

## Theoretical framework

### Systems Theory

"General systems theory is the skeleton of science in the sense that it aims to provide a framework or structure of systems on which to hang the flesh and blood of particular disciplines and particular subject matters in an orderly and coherent corpus of knowledge" (Boulding, 1956,p.208).

Stephen G. Haines defines a system as "a set of elements or components that work together in relationship for the overall good and objective (or vision) of the whole". He uses three important phrases in his definition, which are working together, in relationship and the vision of the whole. Working together is a collective effort that is additional to individual and professional efforts to achieve desired outcome.

Systems theory aims to explain dynamic relationships and interdependence between components of the system and the organization - environment relationships.

It is based on the idea that systems are made up of interconnected parts that work together to achieve a common goal. The key principles of systems theory include the following:

***Holism:*** The principle of holism emphasizes the interconnectedness of systems and the need to study them as a whole rather than as isolated parts. It suggests that the behaviour and characteristics of a system cannot be fully understood by analysing its individual components alone. Rather, it is necessary to study the relationships and interactions between these components to understand how the system functions as a whole.

***Openness:*** The principle of openness emphasizes that systems are not isolated entities but are instead constantly interacting with their environment. Systems are open to inputs and outputs from their environment, and these inputs and outputs can influence the behaviour of the system. Understanding the relationship between a system and its environment is essential for understanding how the system functions and evolves over time.

***Feedback:*** The principle of feedback emphasizes the importance of information flows within a system. Feedback refers to the process by which a system receives information about its own behaviour and uses this information to adjust its behaviour. Feedback can be positive, reinforcing the system's current behaviour, or negative, encouraging the system to change its behaviour to achieve a different outcome.

***Equifinality:*** The principle of equifinality emphasizes that there are multiple ways to achieve the same outcome within a system. Systems can reach the same outcome through different paths or processes. This principle suggests that there is no single "correct" way to achieve a goal, and that systems may employ different strategies to achieve the same outcome.

***Hierarchy:*** The principle of hierarchy emphasizes that systems are organized into levels or hierarchies, with each level consisting of subsystems that work together to achieve a common goal. Each subsystem is itself a system composed of smaller subsystems, and so on. Understanding the relationships between different levels of a system is essential for understanding how the system functions as a whole.

Overall, the key principles of systems theory emphasize the interconnectedness of systems, the importance of understanding the relationship between a system and its environment, and the

need to study systems as a whole rather than as isolated parts. By understanding these principles, individuals can work to analyse and understand complex systems in a more effective manner.

A system is established based on the structure and patterns of the relationships emerging from interactions among components. System theory generally focuses on three levels of observations: the environment, the social organization as a system and human participants within the organization.

According to system theory, the components of each system are structured in a hierarchical ordering and components are interdependent with one another in the system to the extent that one component cannot function without the support of other components.

In the context of system evaluation, Systems Theory provides a framework for understanding the relationships between system components. It emphasizes the importance of understanding the inputs, processes, and outputs of the system, as well as the external factors that may influence its success or failure. A system being evaluated may be affected by external factors such as economic, political, social, and cultural factors. Moreover, systems theory emphasizes the importance of considering feedback loops and interactions between components. Positive feedback loops reinforce system successes, while negative feedback loops can lead to system failures. To improve and adapt the system, the evaluation should identify and understand these feedback loops. When evaluating complex and multifaceted projects within broader contexts, Systems Theory is useful. Identifying the connections between system components and external factors allows us to understand how these factors may influence system success or failure.

The Systems Theory can be applied to both qualitative and quantitative data in a variety of evaluation settings, such as system evaluations, policy evaluations, and organizational evaluations.

**Significance of the theory to this study**

Education Management Information System (EMIS) and the System Theory are two concepts that have a strong link in the context of education management. The System Theory is a theoretical framework used to analyse and understand complex systems by breaking them down into smaller parts and studying their interactions and interrelationships. The EMIS is a tool used to collect, manage, and disseminate data and information related to education, which can be considered a complex system. The System Theory is relevant to EMIS because it provides a framework for understanding how different components of the education system interact with each

other. EMIS can collect data on student enrolment, attendance, academic performance, and demographic characteristics, among other things. This data can be analysed using the System Theory to understand how these different components of the education system interact with each other and how changes in one component can affect other components.

For example, if a policy is implemented to improve student attendance rates, the EMIS can collect data on student attendance, which can be analysed using the System Theory to understand how changes in attendance rates affect other components of the education system, such as academic performance, graduation rates, and funding allocation. The System Theory can also help to identify areas of the education system that may be experiencing dysfunction or inefficiency. By analysing the system as a whole and identifying areas of weakness or inefficiency, educators and policymakers can develop targeted interventions to address these issues and improve the overall functioning of the education system. The link between EMIS and the System Theory is that EMIS can be analysed using the System Theory to understand how different components of the education system interact with each other and how changes in one component can affect other components. By using the System Theory to analyse the education system, educators and policymakers can identify areas of weakness or inefficiency and develop targeted interventions to address these issues and improve the overall functioning of the system.

**Equity theory**

The focus of the idea, according to Adams (1963), is on the exchange relationship, in which individuals offer something and receive something in return. Inputs are the things that a person offers. What the individual obtains on the opposite side of the trade is referred to as outcomes (or outputs). The reference individual or group is the third variable, in addition to inputs and results. A co-worker, relative, neighbour, or group of co-workers can serve as this reference group. It might even be the individual in a different employment or social status. Inputs and Outcomes of equity theory.

Table 2 Inputs and outputs of equity theory

| **Inputs** | **Outcomes** |
|---|---|
| Education, intelligence, experience, training, skills, seniority, age, sex, ethnic background, social status, job efforts, personal appearance, health, spouse's characteristics. | Pay, intrinsic rewards, satisfying supervision, seniority benefits, fringe benefits, job status, status symbols, job perquisites, poor working conditions, monotony, fate, uncertainty. |

The table above shows what inputs and outcomes are expected.

If a person considers one of them to be an input, then it is an input, and he or she deserves a fair return. When only the employee sees a certain input and not the employer, a problem occurs. In this situation, the employee "feels" that injustice has been done, for example, a company may promote an employee based on seniority rather than promotion.

The individual's view of the relationship between their inputs and outcomes determines whether a social trade is regarded fair or inequitable.

When an individual believes his or her inputs are balanced with his or her outputs, and believes others' inputs are balanced with their outcomes, he or she is in a condition of perceived equality. Equity theory also posits that even if an individual's inputs and outputs are unbalanced, he or she would only feel equitable if the other is thought to have unbalanced inputs and outcomes.

According to equity theory, when a situation of unfairness is recognized, the individual would feel distressed. (Walster, Berschied & Walster, 1973). Individuals will be motivated to take action to restore equity as a result of this sad situation (Lerner, Miller & Holmes, 1973). Individuals are more distressed when there is unfairness, and they will work harder to restore equity.

Equity restoration might be physical or psychological. Individuals who feel unfairly treated labour less (reduce inputs), demand a raise from their employer (increase outputs), or destroy employer equipment in order to restore fairness (decrease employer outcome).

By misrepresenting reality, psychological restoration of equity refers to convince oneself that an inequitable connection is partly equitable.

**Consequences of inequity**

Injustice, according to Stacy Adams, will lead to dissatisfaction, anger, and guilt. People will become upset and dissatisfied if they receive less of what they expect in relation to what they put in, and they will feel guilty if they receive more than they deserve. When favourable imbalance

is over-rewarded, Stacy Adams calls this "guilt," whereas when it is under-rewarded, she calls it "anger."

Adams believed that people are motivated to reduce perceived injustice because it is unpleasant, and the intensity of motivation varies directly with the magnitude of inequity they experience.

As a result, Adams presented a number of "inequity reduction" methods.

These means are:

1. A person changing his inputs: in the situation of perceived inequity, a person might increase or reduce his contributions depending on whether the disparity is beneficial or harmful. The individual's inputs, such as productivity and/or job quality, may grow or decline. Education and skill level are more easily changed, while gender, ethnicity, and ethnic origin are not.
2. Person altering his outcomes: Depending on whether the equity is favourable or detrimental, a person can change his outcomes by increasing or lowering them. Inequity can be reduced by either boosting results or lowering inputs.
3. Person distorting his inputs and outcomes cognitively: it is conceivable to mentally move from one reference group or individual to another while physically being in the same primary exchange relationship (Folger and Cropanzano, 1994). When an employee feels underpaid, it may occur to him or her that the amount of compensation he or she is receiving is more than what his or her father earned at this age or that of his or her colleagues in a different field. This is an example of shifting the comparison object to lessen inequity. Some people may decide to quit their jobs.
4. Person leaving the field: people leaving the field in an employment situation might quit their jobs, be transferred, or have greater absence rates.
5. Person acting on other: when confronted with inequality, a person may try to change or cognitively distort others' inputs and outputs, or compel others to leave the area. If a person has less experience than others, he or she may try to reduce the inputs of those persons rather than improving his or her own.
6. Person changing the object of his comparison: when a person encounters inequity and is involved in an exchange relationship with a third party, he or she can modify "the comparison other" with whom he or she compares himself or herself. Inequity would be less severe as a result. When people do the same job but earn different amounts, they may be content with the situation since the person with whom they are comparing has more education, abilities, experience, and

seniority (higher inputs). It is obvious that comparisons are made on the basis of the quality of the output - the comparer's and comparison person's input ratios, and that this comparison may be satisfactory and not inequitable.

7. Choice among modes of inequity reduction: All of the above strategies are mentally available to everybody. Adams offered a set of factors that determine a person's modes.
   a. The positive valence of results will be maximized.
   b. He or she avoids boosting inputs that are time-consuming and expensive to modify.
   c. He or she will fight real and cognitive alterations in inputs that are important to his self-concept and self-esteem.
   d. He or she will be more resistant to modifying cognitions about his or her own outcomes and inputs than about the outcomes and inputs of others.

**Significance of the theory to this study**

The relevance of this theory to this study lies in the fact that non – formal basic education is inequitably treated in comparison to formal basic education. Data about formal basic education such as enrolment, number of institutions, number of teachers, programs, completion rates financing, and others are readily available and published yearly as opposed to non –formal basic education which has little or no data published.

Education Management Information System (EMIS) and the Equity Theory are two concepts that may seem unrelated at first glance, but there is a link between them. The Equity Theory is a concept in social psychology that explains how people perceive fairness and equality in social relationships, whereas the EMIS is a tool used to collect, store, manage, and disseminate data and information related to education. One of the key goals of an EMIS is to ensure equitable access to education for all . EMIS can collect data on student enrolment, attendance, academic performance, and demographic characteristics, among other things. With this information, educators and policymakers can identify disparities in access to education and develop strategies to address these gaps.

For example, if the data reveals that girls are less likely to enrol in school than boys, policymakers can develop targeted interventions to encourage more girls to enrol and stay in school. The Equity Theory is relevant to EMIS because it provides a framework for evaluating the fairness and equity of education policies and programs. If students perceive that the system is

unfair, they may be less motivated to engage with it, leading to lower levels of academic achievement and other negative outcomes. By using the Equity Theory to inform the design and implementation of education policies and programs, educators and policymakers can promote greater equity and inclusion in education. The link between EMIS and the Equity Theory is that EMIS can provide data that allows educators and policymakers to identify and address disparities in access to education, while the Equity Theory provides a framework for evaluating the fairness and equity of education policies and programs. By using both of these tools together, it is possible to promote greater equity and inclusion in education systems.

In a conclusive note, this chapter has provided a comprehensive overview of the theoretical framework and literature surrounding Education Management Information Systems (EMIS) research. The review has identified the different models and frameworks used to conceptualize EMIS, as well as the various factors that impact the successful implementation and use of these systems. Through the analysis of empirical studies, this chapter has also highlighted the potential benefits of EMIS for improving education outcomes and ensuring inclusive and equitable education systems. However, despite the promise of EMIS, the literature also reveals a range of challenges associated with implementation and use. These challenges include issues related to data quality, system compatibility, and capacity building. Overall, this chapter provides a strong foundation for further research on EMIS and underscores the need for continued investigation to improve the design and implementation of these systems in support of effective education management.

# PART II:

# METHODOLOGICAL AND OPERATIONAL FRAMEWORK OF THE STUDY

# CHAPTER 3: RESEARCH METHODOLOGY

This chapter deals with procedures or methods and instruments used to collect data for the study. It treats the research design, the area of study, population of study and instruments used for data collection, organization and analysis.

## Research Design

The direction that a researcher pursues when doing his research is known as a research strategy or approach. Both a qualitative and a quantitative perspective are possible. It is significant because it offers a helpful framework for categorizing various social research methodologies and because it serves as a good grab for a variety of concerns related to the conduct of social research. This problem has a lot of different dimensions. For instance, the exact research issue being researched must be taken into account while selecting a research strategy, design, or methodology (Bryman, 2008). The type of approach to be used may depend on the nature and issues that are the subject of the social research. The researcher choose either the quantitative or qualitative research track depending on the nature of the research problem, the questions that will be asked to solve the problem, and the accompanying study of the literature that proves the topic's significance.

Charles (1998) asserts that all research can be distinguished based on whether its technique generates primarily numerical data (scores and measurements) or primarily verbal data (verbal descriptions and opinions). Quantitative research is defined as relying on numerical data, whilst qualitative research is defined as relying on verbal data.

The confirmatory scientific technique is the one that is primarily used in quantitative research since it focuses on theory and hypothesis testing. For quantitative researchers, formulating a hypothesis and then testing it against empirical data to see if it holds true are of utmost importance.

Conversely, the exploratory scientific technique is mostly used in qualitative research. When developing new theories and hypotheses, qualitative research is sometimes utilized to describe what is happening locally. When little is known about a topic or phenomena and one wishes to learn more about it, qualitative research is used. It is frequently employed to comprehend people's experiences and express their viewpoints. The researcher may choose to use both qualitative and quantitative methodologies when conducting a single research study, which is another choice connected to the social research approach. This type of study is called a mixed technique study. Nowadays, this phrase is frequently used to describe research that blends

quantitative and qualitative methodologies (Bryman, 2008). This indicates that despite their differences, they are not entirely incompatible. Depending on the nature of the study's connected difficulties, they can nevertheless be successfully merged together in social research investigations. Researchers who support mixed research argue that it's critical to apply both confirmatory and exploratory methods in their studies (R.B. Johnson & Onwuegbuzie, 2004).

The qualitative strategy was adopted in order to carry out this evaluation study. Using this strategy, the current state of the EMIS was diagnosed using the guidelines in the UNSECO manual for the development of an NFE-MIS and the Education Data Quality Assessment Framework (Ed-DQAF) developed by the UNESCO Institute for Statistics (UIS) and the World Bank served as the foundation for the methodological approach used to realize the diagnosis. This framework is a comprehensive tool for evaluating the quality of educational data and it reviews data with qualitative indicators. Its thorough analysis compares the quality of education data in a nation to international standards, allowing the country to identify areas that require improvement.

**Population, sampling procedure and sample**

The population consists of the universe of units from which the sample is to be collected (Bryman, 2008). In this study, the population from which my informants were drawn was the EMIS unit of the central service of the Ministry of Basic Education. The selection was purposive since there was need to get the informants with the knowledge on the functioning of the EMIS at the Ministry of Basic Education and because EMIS functions are centralized. These consisted of the personnel assigned to work at the EMIS Unit of the Ministry of Basic Education (particularly the lead inspector in charge of Information & Communication Technologies (ICT)).

**Method of Data Collection**

The SABER-EMIS rubric was employed as the main data gathering tool in this investigation. Documents were also consulted as an additional technique for gathering data. These tools are discussed in this section.

**Questionnaire**

The primary tool for gathering information on the field was an evaluation form. A questionnaire is a self-report data collection instrument that each research participant fills out as part of a research study (Johnson & Larry, 2014). In order to learn more about research participants'

thoughts, feelings, attitudes, views, values, perceptions, personalities, and behavioural intentions, researchers employ questionnaires. You can gather mixed, quantitative, and qualitative data using a questionnaire. A questionnaire's structure and content will match the goals of the researcher.

The Systems Approach for Better Education Results (SABER)-EMIS rubric was used to gather the necessary data. This is a standard tool developed by the UIS and the World Bank to assess the quality of essentially all education data produced by a government's education statistics agency. This methodological approach via the use of SABER-EMIS rubric enabled me explore both the policy intent and implementation level. At the intent level, it involved reviewing all the laws, regulations and other technical documents relevant to EMIS. This helped in assessing the enabling context around which EMIS operates. At the implementation level, all procedures and practises supporting EMIS operations were reviewed at different levels of the education system. This questionnaire identifies four core policy areas with each of the four policy goals having distinct levers (19 in total) that are shared by educational data systems and need to be assessed:

**i. Enabling environment**

The enabling environment is considered to be the legal framework; organizational structure; and institutionalized processes, human resources, infrastructural capacity, and budget of the system. This includes both the laws and the policies surrounding an EMIS. In essence, this policy area is the context in which an EMIS exists. This defined scope of an enabling environment builds on lessons learned from studies of education management systems. Since "EMIS development involves significant organizational, human resource, and technical challenges" (Cassidy 2006, 5), the enabling environment is a crucial policy area.

***Lever 1.1. Legal framework.*** It is imperative that an existing legal framework support a fully functioning EMIS. By definition, this legal framework has an enforcement mechanism. To avoid confusion regarding the system and ameliorate issues that arise from changes in government leadership, the needs of the system must be clearly outlined.

***Lever 1.2. Organizational structure and institutionalized processes.*** The institutional structure of the EMIS is well-defined within the government, has defined organizational processes, and has several functionalities beyond statistical reporting. The unit has a mission statement, defined staff roles and responsibilities, a hierarchical structure, and a defined workflow. The specific

organizational structure of the EMIS allows for institutionalized processes to occur. Defined processes are necessary for the effective flow of information so that all of the layers of the education system can have accurate and appropriate information about their respective roles and functions (Bernbaum and Moses 2011). The core tasks of the EMIS are also identified.

***Lever 1.3. Human Resources.*** Qualified staff members operate the EMIS and opportunities are available to improve their performance and retention.

***Lever 1.4. Infrastructural capacity***. The EMIS has a well-defined infrastructure that enables it to perform its data collection, management, and dissemination functions in an integral manner. The infrastructure of the EMIS is generally context specific, but general elements of EMIS infrastructure need to be in place for the system to perform its designated functions. Lack of infrastructure can limit a system's sustainability and efficiency. As such, sometimes the infrastructure is outdated and there is a need for the "development of strategies to overcome constraints of outdated organizational structures, processes, and practices" (Cassidy 2006, 16). This requires an evaluation of the infrastructural tools that support EMIS functions, together with other necessary infrastructure.

***Lever 1.5. Budget.*** The EMIS budget is comprehensive in order to ensure continuity of operations, system sustainability, and efficiency.

***Lever 1.6. Data-driven Culture.*** A data-driven culture prioritizes data as a fundamental element of operations and decision making, both inside and outside of the education system. Evidence of a data- driven culture can include efforts by the government to promote the collection and utilization of data within and beyond the education system (e.g., national census, funding to research institutes that use data, population statistics, etc.).

**ii. System soundness**

The processes and structures of the EMIS are sound and support the components of an integrated system. Education data are sourced from different institutions, but all data feed into and comprise the EMIS. Databases within an EMIS are not viewed as separate databases, but as part of the EMIS.

***Lever 2.1. Data architecture.*** The data architecture of the EMIS is well defined to ensure full system functionality. The database is structured according to relational standards, well documented, and secure according to current security architecture standards. The database architecture is the set of specifications and processes that prescribe how data is stored in and accessed from a database (Lewis et al. 2001).

***Lever 2.2. Data coverage***. The data in the EMIS is comprehensive, contains some private data, and covers major types of education data, including administrative, financial, human resources, and learning outcomes.

***Lever 2.3. Data analytics***. Tools and processes are available to perform data analytics at different levels on a regular basis. Data analytics is a business intelligence process and ultimately leads to a decision- support system that helps planning and targeting policies. Processes to perform data analytics include descriptive and exploratory data analytics, data tabulations, data associations, correlations, predictive models, and scenario analysis. The outputs of these analytics can range from basic tables and graphs to more complex reports.

***Lever 2.4. Dynamic system.*** The EMIS is elastic and easily adaptable to allow for changes and/or advancements in data needs. It is an agile system that can be adapted to provide solutions to emerging needs.

***Lever 2.5. Serviceability***. The EMIS is at the service of clients by ensuring the relevance, consistency, usefulness, and timeliness of its statistics. Educational statistics within the system have to be relevant for policy making and should allow other stakeholders (including parents and civil society) to obtain objective information about sector performance in a user-friendly manner.

**iii. Quality data**

The processes for collecting, saving, producing, and utilizing information ensures accuracy; security; and high quality, timely, and reliable information for use in decision-making. Data quality is a multidimensional concept that encompasses more than just the underlying accuracy of the statistics produced. It means that not only is the data accurate, but that the data addresses specific needs in a timely fashion. The multidimensionality of quality makes achieving quality education more challenging, as it goes beyond quantitative measures. This difficulty is

compounded by the inadequacy of education statistics in many education systems. Therefore, it is necessary to evaluate and benchmark the quality of data within an EMIS.

***Lever 3.1. Methodological soundness***. The methodological basis for producing educational statistics from raw data should follow internationally accepted standards, guidelines, and good practices. This means the generation and use of well-structured metadata. Methodological soundness may be evaluated on the basis of a hybrid of internationally and nationally accepted standards, guidelines, and good practices, including but not limited to UIS technical guidelines and manuals and the OECD Glossary of Statistical Terms.

***Lever 3.2. Accuracy and reliability.*** Source data and statistical techniques are sound and reliable and statistical outputs sufficiently portray reality. This section examines the accuracy and reliability of source data (from schools and other sources, such as government demographic research units). The term "source data" refers to data provided by schools and other government agencies and/or institutions to the agency responsible for education statistics.

***Lever 3.3. Integrity***. The information contained within the EMIS is guided by principles of integrity. The issue of integrity in educational data and statistics is important for the internal well-being of the education statistics agency. It also has a strong political impact because the belief in data integrity is crucial for maintaining the trust of the general public and achieving political accountability in education. If the public perceives that education data is compromised by politics and therefore not credible, support for education reform or for public education in general is likely to be thin.

***Lever 3.4. Periodicity and timeliness.*** EMIS data and statistics are produced periodically and in a timely manner.

**iv. Utilization for decision making**

The EMIS is wholly utilized by different users of the system to make decisions at different levels of the education system. An EMIS needs to be used so that measures can be taken to improve educational quality. Accurate information on education sector performance enables the design of more informed policies and programs. It is imperative to understand where decision making occurs, if the capacity to analyse and interpret education data exists, and if specific data is available

to inform decisions. “Lack of knowledge and skills to use data and information is not so much limiting the EMIS development as it is limiting development of the education system” (Cassidy 2006, 19). Therefore it is important to understand how an EMIS is utilized.

***Lever 4.1. Openness***. The EMIS is open to education stakeholders in terms of their awareness and capacity to utilize the system. An EMIS is primarily utilized by policy makers and school clients; however, other education stakeholders greatly benefit from and determine a wide variety of uses for the information produced by an EMIS. This lever demonstrates the volume and breadth of use of an EMIS by its users.

***Lever 4.2. Operational use***. Data produced by the EMIS are used in practice by the main education stakeholders. An EMIS should theoretically be the “primary source of operational management data” for the education system (Spratt et al. 2011). This lever evaluates the contexts in which EMIS data is used in practice.

***Lever 4.3. Accessibility.*** Education statistics are understandable and disseminated widely to education stakeholders via a clear platform for utilization, complemented by user support (World Bank 2013d). This section examines how education statistics are presented, seeking a system where statistics are shown in a clear and understandable manner, where forms of dissemination are adequate, and statistics are made available on an impartial basis.

***Lever 4.4. Effectiveness in disseminating findings/results***. The dissemination of education statistics via a management information system is strategic and effective.

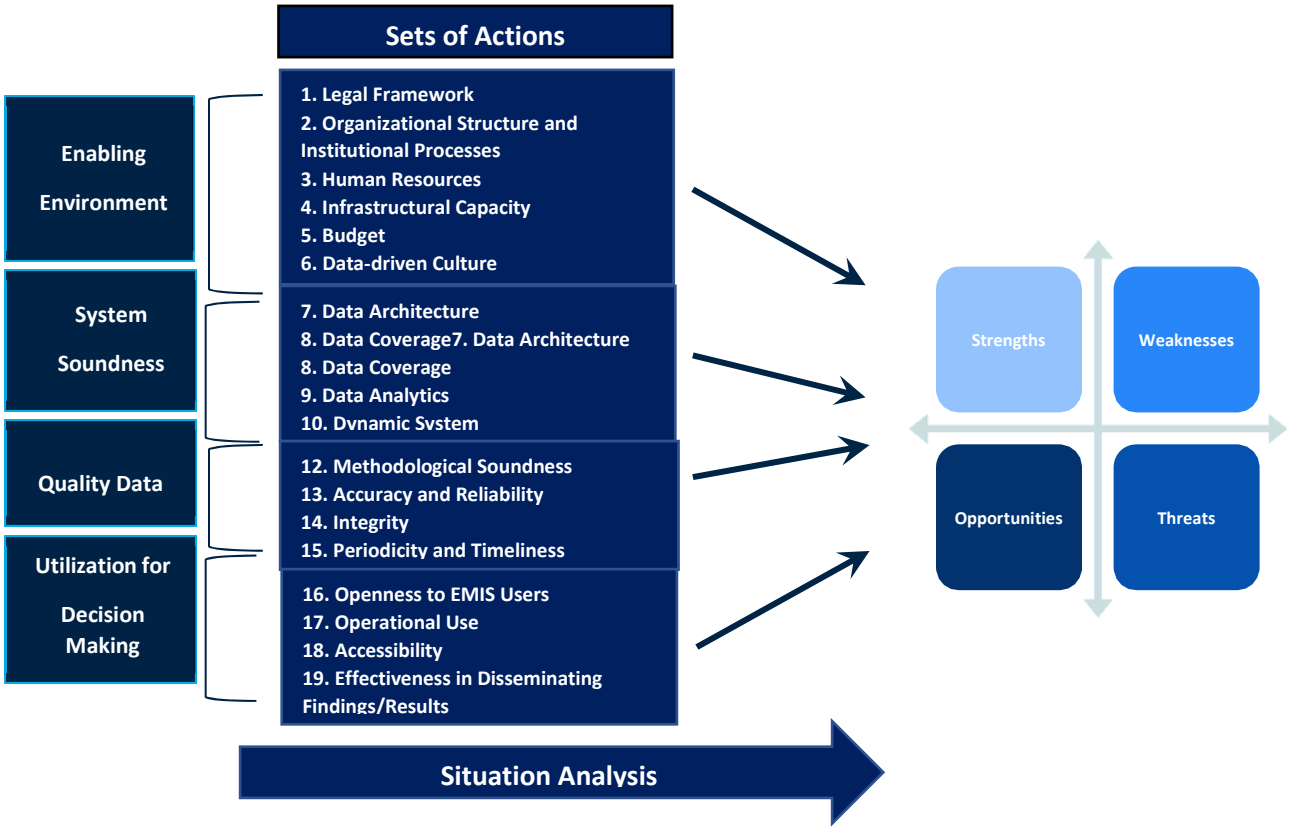
**Document Analysis**

As was stated above, it was required to supplement the data with additional material that was pertinent to my investigations. Documents, according to Cohen (2011), are records of processes and events that can be created by an individual or a group. Governmental documents with aims, legislation, strategies, and objectives were consulted. Thus, the documents were authentic records from the state, in particular the MINEDUB. Additionally, a few international strategy documents were consulted.

**Organization and analysis of data**

Benchmarking the four policy areas of an EMIS is important for policy makers as they are interested in understanding the strengths and weaknesses of the system. After benchmarking the four policy areas using the SABER EMIS rubric, a second level of analysis was performed using SWOT. The four policy areas were projected onto the SWOT through policy levers. Each level of the benchmarking scale was then quantified (latent = 1, emerging = 2, established = 3, and advanced = 4). This was necessary in order to assess the overall system (note that strengths and opportunities were combined, as well as weaknesses and threats).

Figure 3 Analysis of EMIS Benchmarking Results




Source: *What matters most for education management information systems: A framework paper* (p. 55), by H. Abdul-Hamid, 2014. World Bank Group.

On a final note, this chapter has outlined the research methodology for diagnosing the Education Management Information Systems (EMIS) and its impact on education management. The research design was carefully crafted to ensure the validity and reliability of the study, while also providing the flexibility to adapt to unexpected findings or changes in the research context. The data collection methods was selected based on the research questions and objectives. The data analysis techniques chosen enabled the interpretation of data sets and the identification of patterns and relationships that inform the research questions. In addition, the chapter has addressed ethical considerations and strategies for ensuring data privacy and confidentiality. Overall, this chapter provides a robust methodology for conducting EMIS assessment and lays the groundwork for generating new insights into the role of these systems in supporting effective education management.

# CHAPTER 4: PRESENTATION OF RESULTS, DISCUSSIONS AND SUGGESTIONS.

This chapter presents data from the documents analysis and questionnaire. These findings enabled us to produce a comprehensive picture of the current NFE policy framework, covering current literacy and NFE policies, strategies and objectives, implementation structures. We later carried out a diagnosis of the current state of the EMIS be comparing the four policy areas. The chapter was concluded by a SWOT analysis of the system.

## National policy framework for non - formal basic education.

### General Context

#### National definition of literacy and NFE

#### Non-Formal Basic Education

" Non-Formal Basic Education refers in contrast to formal education to set of activities or curricula organized outside the school system but geared towards specific educational objectives for the benefit of children not attending school or early dropouts."

*(Source: order no 332/B1/1464/A/MINEDUB/CAB of 27/09/2016)*

Non-formal basic education is developed for children who have never been to school or who have left school prematurely to enable them to continue their schooling, for those who have the aptitude, or to seek vocational training in a given field of activity (DSSEF, p.25).

#### Literacy

"Literacy is the act of teaching, in a given official or national language, reading and writing as well as arithmetic. It is more a set of training and education activities that help to develop in the trainee basic or life skills, life-technical, professional and social skills necessary for both the development of individual and sustainable development of his/her community and country."

*(Source: order no 332/B1/1464/A/MINEDUB/CAB of 27/09/2016*

**Policy Context of Non – Formal Education**

**National development goals and how education fit in the scope of national development.**

Cameroon needed to put its development plans in a longer-term context in order to deepen the economic recovery that started a decade ago and set it on a sustainable foundation. This is how the requirement for a forward-looking, voluntary vision as a prerequisite to any development strategy came about. A shared vision of development in Cameroon by 2035 emerged as a result of a participatory approach that included all of the nation's development actors and was based on the Great Ambitions of the Head of State, system structural studies, aspirations of the Cameroonian people, and international commitments made by the government. This is how it is formulated: "CAMEROON: AN EMERGING COUNTRY, DEMOCRATIC AND UNITED IN ITS DIVERSITY". (SND30, p. 38).

Four general goals are included in the ambition to become a developing, democratic, and united nation in its diversity, including:

to reduce poverty to a socially acceptable level

to become a middle-income country

to reach the stage of a Newly Industrialised Country and

to strengthen national unity and consolidate the democratic process.

Education will lead to improving the living conditions of the population and their access to basic social services by significantly reducing poverty and underemployment.

The main targets will be to:

to reduce the poverty rate from 37.5% in 2014 to less than 25% in 2030,

to reduce underemployment from 77% in 2014 to less than 50% in 2030,

to raise the Human Capital Index from 0.39 in 2018 to 0.55 and the Human Development Index from 0.52 in 2016 to 0.70 in 2030.

The achievement of this goal contributes to the achievement of the targets of SDG1 to 7; particularly that of SDG4 which is centred on quality education.

**National educational goals, policies, strategies and objectives**

The government's objective for the education and training sector is to support an educational system in which every young graduate is sociologically integrated, bilingual, and skilled in an area that is essential to the development of the nation.

The strategic objectives pursued are:

to ensure that all children who are school-age have access to elementary education

to achieve a 100% completion rate at primary level

minimizing regional differences in school facilities and faculty; and

From 10% to 25% at the secondary level and from 18% to 35% at higher level, improve the availability of vocational and technical training.

In support of the country's industrialisation strategy, the Government's interventions will be based on three (03) axes, namely:

improving access and equity by addressing regional inequities, strengthening the policy regarding school textbooks, and gradually expanding the universalization of education;

improving quality and employability, with a focus on expanding the availability of technical and vocational training, equipping employees in the unorganized sector with cutting-edge skills, and fostering civic engagement;

strengthening the management of the educational system's employees, transferring all resources under the decentralization framework, and encouraging private investment in the education and training industry.

The government plans to establish a certification program for widespread training and capacity building of workers in the informal sector, specifically with regard to vocational training (Train my generation).

***Access and Equity:*** Concerning access to education, the main concern is the large proportion of the school-age population that does not attend school. It is estimated at around 14% for primary school and 26% for secondary school. Girls are the most affected and the phenomenon varies from one region to another. As regards equity, significant regional and local disparities are still observed in the provision of educational structures and teaching staff. The primary and secondary levels are particularly affected by this phenomenon, one of the main causes of which is the non-respect of

the school map. These disparities are also observed in terms of girls' participation in schooling; their numbers tend to decrease as one progresses through the education system.

In order to remedy the shortcomings relating to access and equity in this sector, the Government is planning to put in place a mechanism to ensure access to education and training for all categories of the population. More specifically, this will involve:

i. ensuring that all girls and boys have access to quality pre-school education that prepares them for primary education

ii. to ensure that all girls and boys have equal access to a full course of free, low-cost, quality primary and secondary education that leads to meaningful learning. The actions envisaged will focus on correcting geographical disparities, improving the textbook policy and gradually extending universal education to eight and then ten years of schooling.

***Quality, employability and entrepreneurship:*** The quality of the education and training system, employability, entrepreneurship, the content and quality of the education offer are not always in line with the demand of the productive system in terms of labour force and entrepreneurs or business creators. Indeed, there is no definition of the typical profile of human capital or prioritisation in terms of training and skills that respond to the options and choices of economic and industrial development. Thus, to overcome these shortcomings, emphasis will be placed on the training of trainers, the strengthening of economic patriotism and the provision of technical and vocational training.

***Strengthening the education system:*** The strengthening of the education system involves:

better management of the education system's personnel,

a better distribution of educational infrastructures on the national territory,

a complete transfer of resources from decentralisation,

promotion of private investment in the education and training sector.

**National non – formal education policies, strategies and objectives**

As concerns the Sub-sectoral policy guidelines, the provisions that frame literacy and non-formal education at the national level are seen through the government's consideration of a number of international provisions, laws, strategy and policy documents, among others:

i. Sustainable Development Goals (SDGs), in particular Goal 4 and its targets namely:

- *Target 4.2:* By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education.
- *Target 4.4:* By 2030, substantially increase the number of youths and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.
- *Target 4.6:* By 2030, ensure that all youth and a substantial proportion of adults, both men and women, achieve literacy and numeracy.

ii. Law No. 98/004 of 14 April 1998 on the Orientation of Education in Cameroon, which provides in Title I, Article 2 that:

a. education is a major national priority;
b. it is provided by the State;
c. private partners compete in the provision of education.

iii. The Growth and Employment Strategy document defines and guides government action for each sector of activity. With regard to the education sector, the DSCE recommends reducing the illiteracy rate of people aged 15 and over from 30% today to a residual level (DSCE 2009, p.38) and further notes the need for "a considerable effort to be made to achieve the eradication of illiteracy" (p.41);

iv. The education and training sector strategy paper (DSSEF 2013-2020) constitutes the compass of the Cameroonian education system, both in terms of expanding access to educational services and improving quality and educational governance. Literacy and non-formal education are considered as integral components of the education system;

v. Non-formal education and literacy are intended to be an essential part of the Cameroonian educational system, capable of making a significant contribution to the development of a solid human capital, to support growth, and to promote the full development of the individual at political, social, economic, and cultural levels. This is done in the wish of maximizing participation in the realization of the national ambitions for 2035.

Four strategic axes are established and delineated into broad objectives in order to operationalize the aforementioned vision.

- *Access and equity:* The general goal is the development of a non-formal education and literacy program that is accessible to all social strata.

- *Quality and relevance:* Enhancing the quality and relevance of non-formal education and literacy programs is the goal of this initiative.
- *Partnership and finance:* The goal of partnership and finance is to advance a plan for engaging partners and obtaining funding in support of non-formal education and literacy.
- *Governance and steering:* The development of an effective system of governance and steering in non-formal education and literacy is the primary aim of here.

**Components of the NFE development strategy in Cameroon**

The development strategy of NFE in Cameroon is based on four components, themselves broken down into sub-components.

**Access and Equity**

***Component 1:*** Improvement and diversification of infrastructure and program offerings in NFE

***Sub-component 1:*** Development of training infrastructures.

***Strategic objective:*** To improve the infrastructure offer in NFE

***Goal:*** To increase the capacity of NFE

***Expected results:***

- Increased NFE capacity
- Improved level of equipment of NFE infrastructure

***Strategies:***

- Assess national infrastructure needs
- Rehabilitate old structures
- Open/create and equip complementary NFE facilities

***Sub-component 2:*** Diversification of program offers in favour of target populations and/or those with special needs

***Strategic objective:*** Promote/develop NFE program for target populations and/or those with special needs

***Goal:*** To take into account all social strata and categories in the development of NFE programs.

***Expected result:*** Targeted populations and/or those with special needs are taken into account in the NFE programmes.

***Strategies:***

- Develop NFE programme offerings for target populations
- Increase the number of NFE program offers adapted to special needs populations
- Promote NFE for women and girls
- Promote NFE for socially vulnerable people (disabled, children in distress, the elderly, etc.)
- Adopt affirmative action measures in the major centres of illiteracy.

***Sub-component 3:*** Promotion of national languages

***Strategic objective:*** Make national languages suitable vehicles for education, learning and oral and written communication.

***Goal:*** To restore the value of national languages, particularly in education, training, literacy and post-literacy.

***Expected outcome:*** Learners acquire a command of national languages and derive all the scientifically proven benefits (greater ease of understanding and learning)

***Strategies:***

- Develop research and codification of national languages
- Develop and diversify teaching tools and materials in national languages
- Develop and strengthen human resource capacity in the field
- Sharing experience and good practice
- Promoting a literate environment in national languages

**Quality and Relevance**

***Component 2:*** Development of human resources, curricula and didactic tools in NFE

***Sub-component 1:*** Development of NFE teaching tools and pedagogical capacity building

***Strategic objective:*** Develop training tools, methods and programmes adapted to the different target groups

***Goal:*** To develop adequate tools, methods and training programs

***Expected result:*** Tools, methods and training programs are available that are adapted to the development needs of the target groups and their environment

***Strategies:***

- Develop renewed NFE programmes
- Experiment with the developed programs and materials

- Set up/acquire pedagogical and didactic materials for NFE
- Develop and implement post-literacy programs and strategies for the development of the letter environment in national languages

***Sub-component 2***: Capacity building of actors in the education chain

Strategic objective: To improve the conditions of participation of actors in the pedagogical support chain.

***Objective:*** To increase the efficiency of the actors of the pedagogical support chain.

***Expected results:*** Capacities of the actors in the pedagogical support chain strengthened.

***Strategies:***

- Train the actors in the pedagogical support chain in the use of new programs, pedagogical and didactic materials,
- Equip libraries with specialised books;
- Define a common set of skills for each level;
- Develop training programs in NFE in teacher training colleges and other teacher training structures;
- Share and disseminate good practices;
- Promote pedagogical research in NFE.

**Partnership and Financing**

***Component 3:*** Mobilisation of partners and financial resources in NFE

***Sub-component 1:*** Partnership development

***Strategic objective:*** Develop strategic partnerships with the different stakeholders in NFE.

***Goal:*** Increase the number of partners and their level of involvement in the development of NFE programs.

***Expected result:*** Improved level of involvement of partners in the development of NFE programs.

***Strategies:***

- Seek new technical and financial partners,
- Involve local communities;
- Develop the public/private/civil society organisation partnership in the perspective of the faire-faire approach;
- Progressively involve decentralised local authorities;

- Organise advocacy at national and international level;
- Encourage the accession/ratification of international instruments in favour of NFE;
- Develop a map of the interventions of the different partners;
- Develop a communication and advocacy plan for the benefit of NFE

***Sub-component 2:*** Mobilisation of financial resources

***Strategic objective:*** ensure the mobilisation of financial resources

***Goal:*** Increase the volume of funding for NFE activities

***Expected result:*** Increased financial resources for NFE

***Strategies:***

- Organise fundraising campaigns in favour of NFE;
- Advocate for the definition of a funding quota for NFE in the national budget;
- Create an NFE development fund.

**Governance and Steering**

***Component 4:*** Improving the governance of NFE

***Sub-component 1:*** Development of the institutional framework

***Strategic objective:*** Develop an institutional framework for program implementation involving all stakeholders.

***Objective:*** To improve the framework of intervention of the different actors of the NFE

***Expected results:*** A better structured and organized NFE sub-sector with a functional consultation framework.

***Strategies:***

- Promote participatory development through the involvement of all NFE actors (population, decentralised territorial authorities, civil society organisations, beneficiaries);
- Raise awareness, mobilise and involve communities at the grassroots level;
- Create networks of actors at the central and deconcentrated levels.

***Sub-component 2:*** Management of NFE resources

***Strategic objective:*** Develop an efficient resource management system

***Goal:*** Increase the performance of the management of sub-sectoral actors.

Expected result: Effective resource management system in place.

***Strategies:***

- Develop texts and other tools for the development of the NFE;
- Promote Results-Based Management;
- Put in place a human resources management strategy based on a 'do-it-yourself' approach.

***Sub-component 3:*** Development of the NFE - MIS

***Strategic objective:*** to set up an information system for the management of NFE

***Goal:*** To have objective and reliable statistical data on NFE at the national level

***Expected result:*** NFE management information system established

***Strategies:***

- Improve the institutional and organisational framework of the NFE-MIS;
- Develop the partnership and mobilise the resources necessary for the proper functioning of the NFE-MIS
- Improve data quality and dissemination.

**Decentralization of policy making and planning of non – formal education and extent of decentralized implementation**

- Law No. 2004/018 of 22 July 2002 establishing the rules applicable to councils and law No. 2004/019 of 22 July 2004 establishing the rules applicable to regions transfer to these decentralized territorial collectivises a certain number of competences in the area of National Education and Training, particularly in the areas of literacy, vocational training and promotion of national languages;
- Decree No. 2011/408 of 9 December 2011 on the organization of the Government, which entrusts the Ministry of Basic Education with the mission of combating illiteracy;
- Decree No. 2012/268 of 11 June 2012 on the organization of the Ministry of Basic Education creates a Directorate and an Inspectorate of Pedagogy each in charge of Literacy, Non-Formal Basic Education and the Promotion of National Languages;
- Decree No. 2016/1247/PM of 23 May 2016 establishing the modalities for the exercise of certain competencies transferred by the State to the Councils in the area of literacy;
- Decree No. 332/B1/1464/A/MINEDUB/CAB of 27 September 2016 on the terms of reference specifying the conditions and technical modalities for the exercise of the competencies transferred by the State to the councils notably:

*Article 4:* (1) Literacy and non-formal basic education sessions shall in principle take place throughout the year.

(2) They shall depend on the specific situation of each region or local council, the needs and aspirations of the beneficiary population.

*Article 5:* (1) Literacy sessions take place after classes in government nursery and primary schools, namely in the afternoon, for centres located in such schools.

(2). The days and hours of literacy sessions shall be set by the Head of the FLC and NFBEC, taking into consideration the specific situation of the population concerned, and in close collaboration with the said population.

*Article 6:* The Head-teachers of the schools concerned shall put School infrastructure covered by this order at the disposal of the Head of the Functional Literacy Centre (FLC) and Non Formal Basic Education Centre (NFBEC) after the end of activities in government nursery and primary schools.

*Article 7:* The Mayor shall be responsible for the maintenance and upkeep of such infrastructure during literacy sessions.

- The RAMAA protocol also known as the Référentiel de l'alphabétisation des adultes en Afrique (Reference Framework for Adult Literacy in Africa) signed in February 2016 between Cameroon and the UNESCO Institute for Lifelong Learning, relating to the development and implementation of quality methods and tools to measure the learning acquired by young people and adults at the end of the various literacy programs;
- Decree No. 2018/190 of 02 March 2018 supplementing certain provisions of Decree No. 2011/408 of 09 December 2011 on the organization of the government. It creates a Ministry of Decentralization and Local Development, which is responsible for the development, monitoring, implementation and evaluation of the Government's policy on decentralization as well as the promotion of local development.

**Amount of national budget allocated to non –formal education**

The training of community animators, supplementary training for instructors assigned with this area, instructional materials, furnishings, etc. are all covered by state money. The budget's size is not predetermined. The state budget devoted to literacy and non-formal education comes essentially from the budgetary provisions of the ministerial department in charge of basic

education. Moreover, upon examination, these budgetary provisions are still insufficient despite the appreciable efforts made since 2013 by MINEDUB, the lead ministerial department for literacy.

The observation that emerges is that the budget allocated to the literacy and non-formal education is far below the 03% of the education sector budget decided by the African States, including Cameroon, at the African Regional Conference on Literacy held in Bamako (Mali) from 10 to 12 September 2007. With regard to bilateral or multilateral funds, they mainly concern resources mobilized by funding agencies such as cooperation and United Nations system organizations, notably UNESCO. Civil Society Organizations, consisting of NGOs and faith-based associations, finance their own activities. These organizations operate with membership fees, donations and sometimes grants and support from various partners.

Finally, according to the findings of the diagnostic study of NFE validated in 2012, households in urban areas spent an average of 6% of their budget on NFE in 2000, and those in rural regions paid 3.7%.

## Institutional Structured and Partnerships for Non – Formal Education

### National institutions responsible for NFE planning and implementation

At the Ministry of Basic Education, the directorate of Literacy, Non - Formal Education and promotion of national languages is responsible for the planning and implementation of non - formal education activities.

This directorate is structured as follows:

The directorate of literacy, non-formal basic education and the promotion of national languages.

*Article 41:* Under the authority of a Director, the Directorate of Literacy, Non-Formal Basic Education and the Promotion of National Languages is responsible for:

- Administrative coordination, monitoring and evaluation of literacy structures, non-formal basic education and the promotion of national languages;
- Carrying out studies and formulating the needs for supervisory staff for literacy structures, in conjunction with the Regional Basic Education Delegations;
- Synthesizing the needs relating to the creation of new structures for literacy, non-formal basic education and the promotion of national languages;
- Monitoring the implementation of the national literacy policy;

- Promoting national languages.

(2) It comprises:

- The Sub-Directorate for Literacy and National Languages;
- The Promotion of National Languages;
- The Sub-Directorate for Non-Formal Basic Education.

SECTION I: The sub-directorate for literacy and the promotion of national languages.

*Article 42:* (1) Placed under the authority of a Deputy Director, the Sub-Directorate for Literacy and the Promotion of National Languages is responsible for:

- Monitoring the implementation of the national policy on literacy and the promotion of national languages;
- Monitoring the implementation of strategies to combat illiteracy; and
- Monitoring the implementation of bridges between non-formal and formal education;
- Synthesizing the needs relating to the creation, opening and operation of literacy centres;
- The exploitation and synthesis of statistics relating to literacy structures.

2) It comprises:

- The department for functional literacy and the promotion of national languages;
- The department for the management of literacy centres.

*Article 43:* Under the authority of a Head of Department, the Functional Literacy and National Language Promotion Department is responsible for:

- Organizing functional literacy activities and the promotion of national languages
- Promoting functional literacy and national languages;
- Developing strategies for combating illiteracy in return.

*Article 44:* Placed under the authority of a Head of Service, the Literacy Centre Management Service is responsible for:

- Monitoring the operation of literacy centres
- Synthesizing studies relating to human resource needs
- Synthesizing the needs relating to the creation, opening and operation of literacy centres;
- Keeping the file of literacy centres.

SECTION II: The Sub-Directorate for Non-Formal Basic Education

*Article 45*: (1) Under the authority of a Deputy Director, the Sub-Directorate for Non-Formal Basic Education is responsible for:

- The implementation of the non-formal basic education policy;
- The implementation of bridges between non-formal and formal basic education;
- Synthesis of studies relating to human resource needs;
- Monitoring the operation of non-formal basic education centres;
- Synthesis of needs relating to the creation, opening and operation of non-formal basic education centres.

2) It includes

- The Non-Formal Basic Education Department;
- The department for the monitoring of non-formal basic education centres.

*Article 46:* Placed under the authority of a Head of Department, the Non-Formal Basic Education Department is responsible for:

- The organization of Non-Formal Basic Education activities;
- The development of Non-Formal Basic Education strategies.

*Article 47:* Placed under the authority of a Head of Service, the Non-Formal Basic Education Centres Monitoring Service is responsible for:

- Monitoring the functioning of Non-Formal Basic Education Centres;
- Synthesizing the needs relating to the creation, opening and operation of Non-Formal Basic Education Centres;
- Maintaining the file of Non-Formal Basic Education Centres (NFBEC).

  At the regional level, the structures in charge of NFE planning and implementation are:
- Regional head of community preschool centres for literacy, non-formal basic education.
- Regional pedagogical inspectorate in charge of literacy, non-formal basic education and the promotion of national languages.

  The inspectorate has two pedagogical advisors in charge of literacy, non-formal basic education and the promotion of national languages.

  At the divisional level we have:

- Divisional pedagogical advisor in charge of literacy, non-formal basic education and the promotion of national languages.

**Involvement of local communities in implementing NFE**

**Decentralized Territorial Communities**

The decentralization option taken by the Government of Cameroon gives more responsibilities and advantages to the Decentralized Territorial Communities in the management of local affairs including literacy and non-formal basic education. Decentralised Local Authorities will be able to direct and adjust the resources available and/or transferred to their communities where the needs are greatest. This will ensure that they are effective and efficient in their development work.

**Civil Society Organisations**

Civil society organisations, like private actors, carry out literacy and non-formal basic education activities directly with the beneficiary populations. This option gives them the opportunity to administer, without intermediaries, action plans aimed at reducing illiteracy on the ground, particularly in the PTAs. In this way, they contribute to the promotion of local development.

**The Private Sector**

The private sector has the opportunity to act directly in the education sub-sector by creating and administering Functional Literacy Centres in accordance with state guidelines. This is not only a business opportunity but also a possibility for companies to train their employees and benefit from the advantages offered.

**The local population**

Local families benefit from the knowledge, skills and attitudes acquired in functional literacy within a reasonable timeframe and without having to travel. These skills are essential for the development of their families and consequently to contribute to the development of their respective localities or even the whole country.

## Discussion of Findings

EMIS in Cameroon is complex, with each of the Ministries of Education collecting data for the subsector for which they are responsible in the absence of institutional coordination mechanisms. The EMIS for primary education, managed by MINEDUB, is perhaps the most advanced. (Source: The role of EMIS in supporting progress towards SDG4, pg. 81).

In this section, we used the Ed-DQAF with its 4 policy areas and 19 policy levers to conduct a benchmark of EMIS at the Ministry of Basic Education.

The results of the analysis and findings are discussed below.

### Enabling environment

The enabling environment includes the policies, regulations and resources that support the development, implementation and use of EMIS. It is an assessment of intended policies in relation to a sustainable infrastructure and human resources that can handle data collection, management and access.

The government has made significant progress in recent years towards improving its education management information system (EMIS). However, there is still room for improvement in creating an enabling environment for the effective implementation of EMIS. Improving the enabling environment of the EMIS at the Ministry of Basic Education is crucial for ensuring that the system is effective, efficient and sustainable. A score of 66.67% against the benchmark shows that the system contains most components of a comprehensive enabling environment.

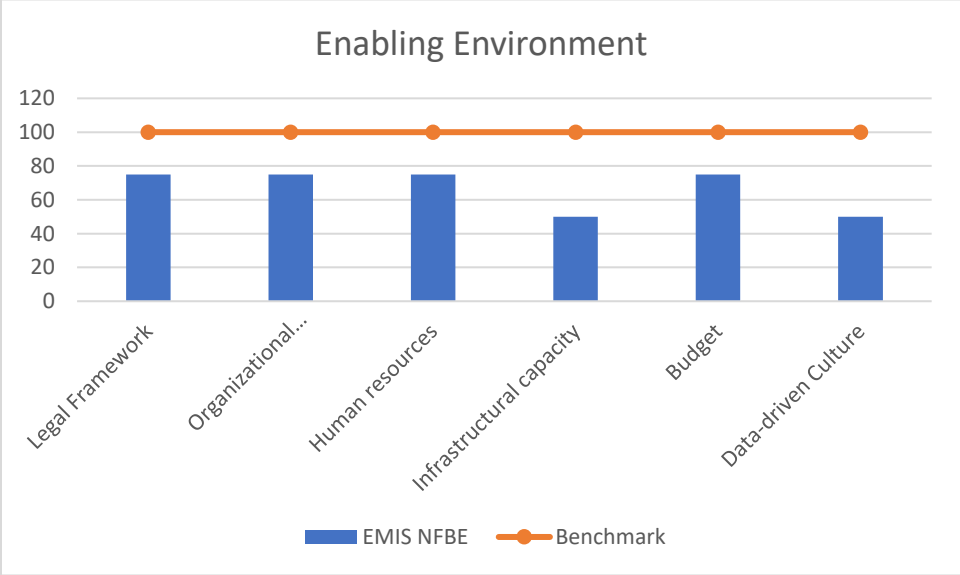
This low scoring results from; lack of a clear legal framework for data privacy and protection, which could lead to unauthorized access or misuse of data. Additionally, there is a lack of clarity on the roles and responsibilities of different stakeholders in the data collection and management process, inadequate coordination among stakeholders, and insufficient institutionalization of the system, limited capacity and technical expertise among EMIS staff and stakeholders, poor connectivity in rural and remote areas, limited funding for data collection, management, and analysis, and inadequate investment in data infrastructure and technology, limited awareness and understanding of the value of data-driven decision-making among education stakeholders in Cameroon, low capacity for data analysis, interpretation, and communication.

Table 3 Enabling  environment

| ENABLING ENVIRONMENT | EMIS MINEDUB | BENCHMARK |
|---|---|---|
| | **66.67%** | **100%** |
| Legal Framework | 75% | 100% |
| Organizational structure and institutionalized processes | 75% | 100% |
| Human resources | 75% | 100% |
| Infrastructural capacity | 50% | 100% |
| Budget | 75% | 100% |
| Data-driven Culture | 50% | 100% |

Source: Field data (2023)

Figure 4 Score of Enabling Environment




Source: Field data (2023)

### System Soundness

System soundness refers to the ability of the EMIS to generate accurate, reliable, and timely data that can inform decision-making processes at all levels of the education system.  It assesses the

degree to which the processes and structure support the components of a comprehensive information management system.

A benchmark score of 45% by the EMIS at MINEDUB shows that the system has basic process and a structure that do not support the components of an integrated system.

This below average scoring is due to the following challenges; limited interoperability among data systems, inadequate data standardization, limited coverage of certain geographic areas or population groups, inadequate data quality control, limited flexibility and responsiveness to changing needs, inadequate integration with other education systems and processes, and limited capacity for innovation and improvement, limited accessibility, inadequate user support, and outdated technology, which can lead to inefficiencies and delays in the system. Additionally, limited capacity and skills among education stakeholders for using the system also contribute to the challenges in the serviceability of the EMIS.

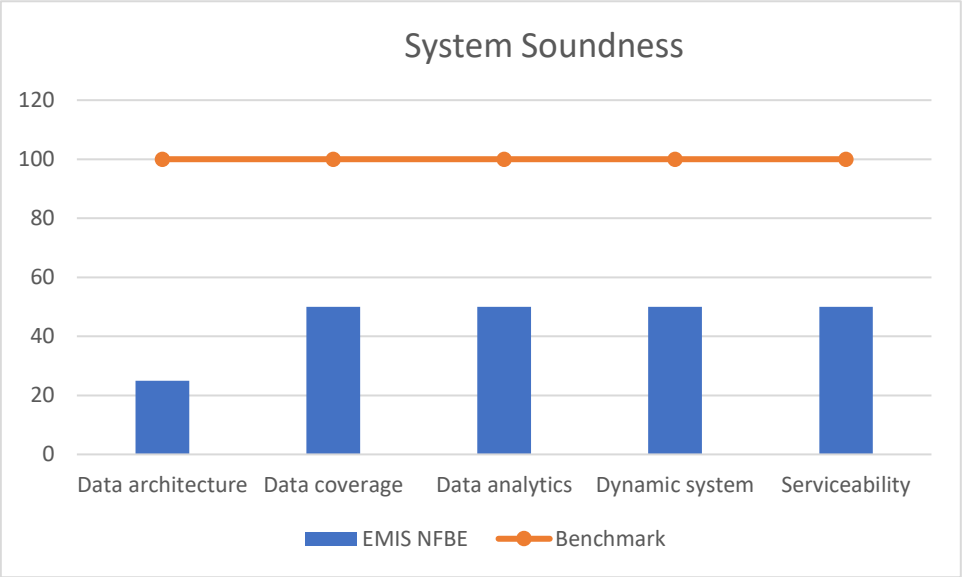
Improving the system soundness of the Education Management Information System (EMIS) in MINEDUB is essential for ensuring that the system is reliable and effective.

Table 4 System Soundness

| **SYSTEM SOUNDNESS** | **EMIS MINEDUB** | **BENCHMARK** |
|---|---|---|
| | **45%** | **100%** |
| Data architecture | 25% | 100% |
| Data coverage | 50% | 100% |
| Data analytics | 50% | 100% |
| Dynamic system | 50% | 100% |
| Serviceability | 50% | 100% |

Source: Field data (2023)

Figure 5 System Soundness




Source: Field data (2023)

**Quality Data**

High-quality data can help policymakers and education practitioners to identify gaps and disparities in the education system, monitor progress, and evaluate the effectiveness of policies and interventions. This policy area is an assessment of the degree to which an EMIS system accurately collects, securely saves and produces high-quality, timely information. The EMIS at the Ministry of Basic Education had a benchmark score of 50% shows that the system has basic mechanisms to collect, save and produce timely, quality information; however, it's accuracy might be questionable.

This scoring is due to the fact that; data collection, analysis, and reporting can be delayed or incomplete, particularly at the school and divisional levels. This can result in outdated or unreliable data that cannot inform decision-making processes in a timely and effective manner. Additionally, limited transparency in data collection and reporting processes of the EMIS, inconsistencies in data collection, analysis, and reporting processes, which can lead to inaccuracies and errors in the data, limited capacity and skills among education stakeholders for data collection and analysis.

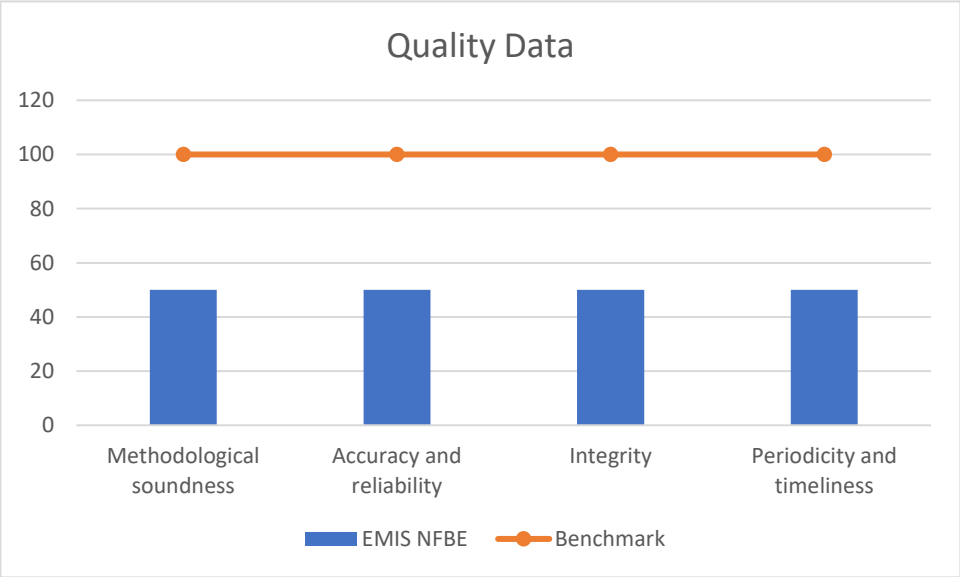
Improving the quality of data for the Education Management Information System (EMIS) is crucial for ensuring that the system is reliable and effective in generating data that can inform decision-making processes in the education sector.

Table 5 Quality Data

| QUALITY DATA | EMIS MINEDUB | BENCHMARK |
|---|---|---|
| | **50%** | **100%** |
| Methodological soundness | 50% | 100% |
| Accuracy and reliability | 50% | 100% |
| Integrity | 50% | 100% |
| Periodicity and timeliness | 50% | 100% |

Source: Field data (2023)

Figure 6 Quality Data




Source: Field data (2023)

**Utilization for decision-making**

This entails the EMIS is wholly utilized by different users of the system to make decisions at different levels of the education system. This is an assessment of the reality of system implementation and utilization of EMIS information in decision making. A benchmark score of

50% tells us that the EMIS in MINEDUB is used by some education stakeholders, but not for major policy decision making.

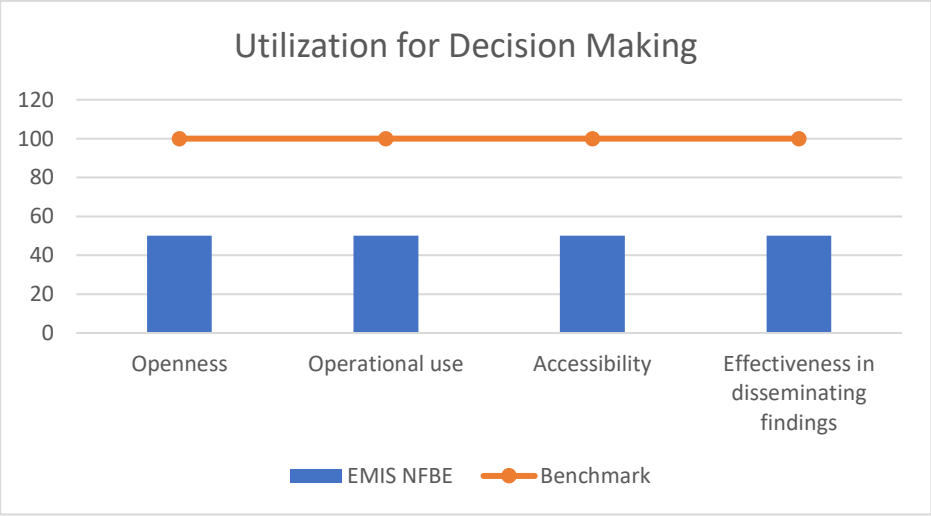
This score might be due to; data is not readily available or accessible to the public, particularly at the school and divisional level. This lack of transparency can hinder effective education planning and decision-making. Additionally; insufficient resources and infrastructure to collect and analyse education data, limited stakeholder participation in the education planning and decision-making processes, some education stakeholders may face barriers to accessing and using EMIS data, limited technological infrastructure, limited capacity and skills for data analysis, and limited availability of data in local languages, limited use of technology and innovative communication methods to disseminate EMIS findings.

Table 6 Utilization for decision-making

| **UTILIZATION FOR DECISION MAKING** | **EMIS MINEDUB** | **BENCHMARK** |
|---|---|---|
| | **50%** | **100%** |
| Openness | 50% | 100% |
| Operational use | 50% | 100% |
| Accessibility | 50% | 100% |
| Effectiveness in disseminating findings | 50% | 100% |

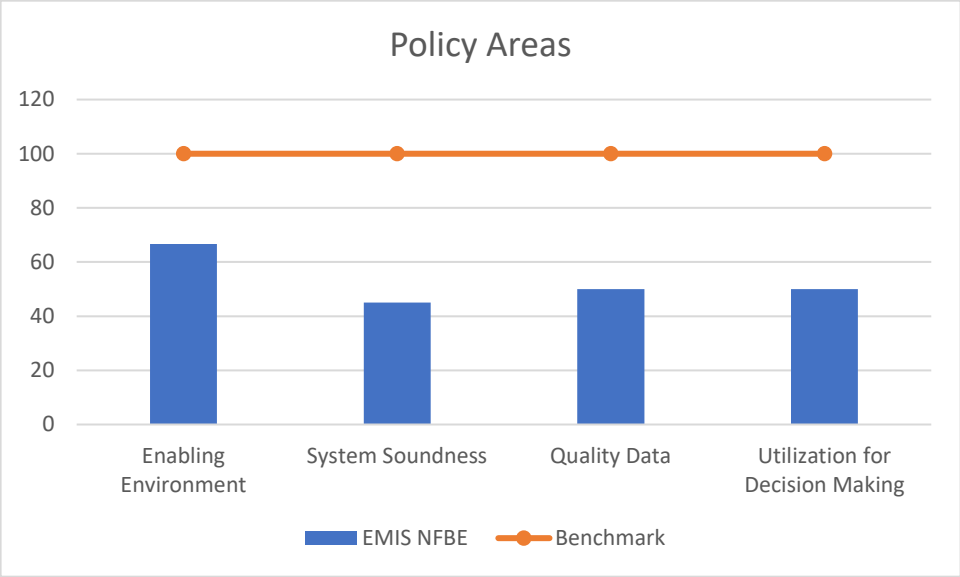
Source: Field data (2023)

Figure 7 Utilization for decision-making




Source: Field data (2023)

Figure 8 Synthesis of scores of the four policy areas of the SABER-EMIS Rubric




Source: Field data (20230

## SWOT Analysis

SWOT analysis is a strategic planning tool used to identify and analyse an organization's internal strengths and weaknesses, as well as its external opportunities and threats. The acronym SWOT stands for Strengths, Weaknesses, Opportunities, and Threats.

*Strengths:* These are internal factors that give an organization an advantage over others. Examples of strengths could be a skilled workforce, or innovative ideas.

*Weaknesses:* These are internal factors that put an organization at a disadvantage compared to others. Examples of weaknesses could be poor management, outdated technology, or a lack of financial resources.

*Opportunities:* These are external factors that an organization could potentially take advantage of to improve its position in the market. Examples of opportunities could be emerging trends, changes in user behaviour, or new sector segments.

*Threats:* These are external factors that could negatively impact an organization's position in the market. Examples of threats could be increased competition, economic downturns, or regulatory changes.

By analysing these four elements, an organization can identify areas where it needs to improve and opportunities it can pursue. This information can then be used to develop a strategic plan that aligns with the organization's goals and objectives.

For the purpose of our studies, the four policy areas were projected onto the SWOT through the 19 policy levers.

Strengths and opportunities were combined as well as weaknesses and threats.

Table 7 SWOT Analysis

| | |
|---|---|
| Strengths/ Opportunities | • Laws and regulations provide a comprehensive legal framework for the development and management of the Education Management Information System in MINEDUB. They define the roles and responsibilities of the different levels of the system, from the national to the school level, and provide guidelines for data collection, analysis, and dissemination.<br>• EMIS in MINEDUB has a hierarchical organizational structure, with four levels of management and information systems. Each level is responsible for the development and implementation of education policies and strategies at its respective level and is headed by a specific delegation. The system is designed to collect, analyse, and disseminate education data at all levels of the education system.<br>• Majority of EMIS staff in MINEDUB are qualified to operate the system and frequent opportunities are available to improve staff performance and retention.<br>• The system budget contains the majority of required categories to ensure that most parts of the system are sustainable and efficient. |
| Weaknesses /threats | • The system has a basic or incomplete infrastructure. Challenges include hardware and software, limited connectivity, and insufficient technical expertise.<br>• There is limited interoperability among data systems, inadequate data standardization, and limited use of data warehousing and data mining techniques.<br>• Limited coverage of certain geographic areas or population groups, inadequate data quality control, and limited integration with other data systems.<br>• Limited capacity for data analysis and interpretation, inadequate data visualization tools, and limited integration with other data systems. |

| | |
|---|---|
| | • Limited flexibility and responsiveness to changing needs, inadequate integration with other education systems and processes, and limited capacity for innovation and improvement.<br>• Limited accessibility, inadequate user support, and outdated technology, which lead to inefficiencies and delays in the system. Additionally, limited capacity and skills among education stakeholders for using the system.<br>• Inconsistencies in data collection, analysis, and reporting processes, which lead to inaccuracies and errors in the data.<br>• Data manipulation, falsification, and errors, which undermine the accuracy and reliability of the data.<br>• Limited transparency in data collection and reporting processes also contribute to the challenges in the integrity.<br>• Data collection, analysis, and reporting can be delayed or incomplete, particularly at the school and local levels.<br>• Data is not readily available or accessible to the public, particularly at the school and local levels.<br>• Limited capacity and technical skills among EMIS personnel to effectively analyse and use education data.<br>• Insufficient resources and infrastructure to collect and analyse education data.<br>• Education stakeholders face barriers to accessing and using EMIS data, including limited technological infrastructure, limited capacity and skills for data analysis, and limited availability of data in local languages.<br>• Limited use of technology and innovative communication methods to disseminate EMIS findings. |

Source: Field data (2023)

## Suggestions

Presented here is a series of suggestions derived from our comprehensive evaluation of the use of Education Management Information Systems (EMIS) in the realm of non-formal education. Through an examination of the impact, challenges, and benefits of EMIS adoption in non-formal education settings, these suggestions could provide actionable insights for educational institutions, policymakers, and stakeholders.

These suggestions are sectioned as per the policy areas of the SABER-EMIS rubric.

### Enabling Environment

To improve the enabling environment for the EMIS at the Ministry of Basic Education, the following steps could be taken:

- Developing and implementing policies and regulations that support the development and use of the EMIS, including guidelines for data collection, management, and dissemination.
- Increasing funding and resource allocation for the development, maintenance, and upgrade of the EMIS, including infrastructure, equipment, and personnel.
- Building capacity among stakeholders in the education sector to effectively use and analyze the data generated by the EMIS, including training programs for teachers, school administrators, and policymakers.
- Encouraging partnerships and collaborations between different stakeholders in the education sector, including the government, civil society organizations, and the private sector, to support the development and use of the EMIS.
- Ensuring that the EMIS is well integrated into the education system and that data generated by the system is used to inform policy and decision-making processes at all levels.

Improving the enabling environment for the EMIS at MINEDUB is critical for promoting sustainable development in the education sector. By creating a supportive environment that fosters the development, implementation, and use of the EMIS, MINEDUB can ensure that the system is effective in generating data that informs policies and decision-making processes, ultimately leading to improved education outcomes for all.

### System Soundness

To improve the system soundness of the EMIS in MINEDUB, the Ministry can take several steps, including:

- Ensuring that data collection procedures are standardized, reliable, and valid, with clear definitions and instructions for data entry.
- Implementing quality control procedures to ensure that data entered into the EMIS is accurate, complete, and consistent.
- Providing regular training and technical support for data collectors and system administrators to ensure that they are equipped with the skills and knowledge necessary to maintain the system and generate reliable data.
- Developing and implementing a system for data validation and verification to ensure that the data generated by the EMIS is accurate and reliable.
- Establishing a system for data archiving and retrieval to ensure that data is easily accessible and can be used to inform policy and decision-making processes at all levels.

Improving the system soundness of the EMIS in MINEDUB is critical for ensuring that the system is effective in generating data that can be used to inform policies and decision-making processes in the education sector. By implementing standardized data collection procedures, quality control procedures, and training programs for data collectors and system administrators, MINEDUB can ensure that the EMIS is reliable and effective in generating data that can be used to improve education outcomes for all.

### Quality Data

To improve the quality of data for the EMIS in MINEDUB, the Ministry can take several steps, including:

- Developing clear data definitions and standards to ensure that data is collected, entered, and analysed consistently across the education system.
- Providing training and technical support for data collectors to ensure that they understand data definitions and can accurately collect and enter data into the EMIS.

- Implementing quality control procedures to ensure that data entered into the EMIS is accurate, complete, and consistent.
- Using data analysis tools to identify inconsistencies, errors, and missing data, and taking steps to address these issues.
- Establishing a system for data archiving and retrieval to ensure that data is easily accessible and can be used to inform policy and decision-making processes at all levels.

Improving the quality of data for the EMIS in MINEDUB is critical for ensuring that the system is effective in generating data that can be used to improve education outcomes for all. By providing training and technical support for data collectors, implementing quality control procedures, and using data analysis tools to identify inconsistencies and errors, MINEDUB can ensure that the EMIS generates high-quality data that can inform policies and decision-making processes in the education sector.

**Utilization for decision making**

To improve the utilization of the Education Management Information System (EMIS) in MINEDUB for decision-making, the Ministry can take several steps, including:

- Promote a culture of data use by raising awareness about the importance of data in decision-making processes and by providing training and capacity-building activities for decision-makers at all levels.
- Create user-friendly data visualization tools that allow decision-makers to easily access and interpret the data generated by the EMIS. These tools can include dashboards, reports, and infographics that present data in a clear and concise manner.
- Decision-makers can use the data generated by the EMIS to align policies and interventions with the needs of the Ministry. For example, data on student performance can be used to identify areas where additional resources and support are needed.
- Engage stakeholders in the decision-making process by sharing data and seeking feedback on policies and interventions. This can help to build consensus and ensure that policies and interventions are effective and sustainable.

- Regularly updating and improving the EMIS to ensure that it continues to meet the needs of decision-makers. This can include adding new data elements, improving data collection methods, and enhancing data analysis tools.

Improving the utilization of the EMIS for decision-making can help to improve education outcomes in MINEDUB by ensuring that policies and interventions are based on accurate and reliable data. By creating a culture of data use, providing user-friendly data visualization tools, aligning policies and interventions with data, engaging stakeholders in the decision-making process, regularly updating and improving the EMIS, and providing support for evidence-based decision-making, MINEDUB can improve the effectiveness and efficiency its system.

**Implication of the study**

This study distinguishes itself from previous studies primarily by its general objective, making it one of the pioneer studies into the use of EMIS in non - formal education. This study has demonstrated that having an effective and efficient EMIS is a prerequisite for quality educational data that can lead to improved management of any education sector.

**Limitations of the study**

The findings from this study apply only to the Cameroon Ministry of Basic Education which is one of the five ministries directly involved in education and training. Also, this study was mainly centred at the central level since EMIS in the Ministry of Basic Education is housed at the central level, with the regional bodies mainly concerned with collecting data that feeds the EMIS (EMIS is not decentralised at the regional levels).

In effect, though the results cannot be generalized to apply to the entire country, they can be used to understand the issues that surround the quality of data produced by the EMIS.

**Actions regions and councils can undertake to promote literacy and NFE**

Promoting literacy and non-formal education is essential for ensuring that every citizen has access to education and can acquire the necessary skills to participate in society and the economy. Here are some actions that can undertake to promote literacy and non-formal education:

**At the institutional level**

Here are some institutional measures that regions and councils can take to promote non-formal education:

- *Establishment of Non-Formal Education Centres:* Regions and councils can set up Non-Formal Education Centres (NFECs) in different locations within their jurisdiction. These centres can be used to provide a variety of non-formal education programs to the community. They can be set up in community halls, schools, and other public spaces.
- *Advocacy for Government Support:* They can equally advocate for government support for non-formal education programs. This can be done by engaging with government officials and policymakers to standardise data collection, promote the importance of non-formal education and the need for government support.
- *Partnership with Private Sector:* Private sector can be a good partner for the regions and councils to promote non-formal education. The private sector can provide funding for non-formal education programs or sponsor programs that are relevant to their business. They can also provide training and job opportunities to graduates of non-formal education programs.

Overall, promoting non-formal education requires a multi-faceted approach that involves collaboration between different stakeholders. Regions and councils can take the lead in promoting non-formal education by implementing the measures listed above.

**At the organisational level**

In addition to institutional measures, regions and councils in Cameroon can take several organizational measures to promote non-formal education. Some of these measures include:

- *Needs Assessment:* Regions and councils can conduct needs assessment surveys to identify the needs of the community and design non-formal education programs that meet those needs. This can involve engaging with community leaders, NGOs, and other stakeholders to identify areas of high demand for non-formal education.
- *Recruitment and Training of Instructors:* They can recruit and train qualified instructors to deliver non-formal education programs. Instructors should have the necessary skills and knowledge to deliver the curriculum effectively and engage with learners from diverse backgrounds.

- *Monitoring and Evaluation:* Regions and councils can monitor and evaluate the effectiveness of non-formal education programs to ensure that they are achieving their intended outcomes. This can involve tracking attendance, conducting surveys, and gathering feedback from learners and instructors, partnership with stakeholders for data collection and analysis.

Overall, these organizational measures can help regions and councils to promote non-formal education programs that are effective, relevant, and accessible to the community. By working collaboratively with stakeholders and engaging with the community, they can design and implement non-formal education programs that meet the needs of learners and contribute to the overall development of the region.

**At the administrative level**

Regions and councils can take several administrative measures to support the development and implementation of non-formal education programs. Some of these measures include:

- *Policy Development:* Regions and councils can develop policies to promote non-formal education and ensure that it is integrated into the overall education system. Policies can provide guidance on the implementation of non-formal education programs, set standards for quality, and ensure that learners receive recognition for their achievements.
- *Budget Allocation:* They can allocate a budget for non-formal education programs to support the development and implementation of these programs. This can include funding for instructor salaries, learning materials, and facilities.
- *Reporting and Monitoring:* They can establish reporting and monitoring mechanisms to track progress and evaluate the effectiveness of non-formal education programs. This can include regular reporting on program outcomes, surveys of learners and instructors, and ongoing monitoring and evaluation.

Overall, administrative measures can provide a supportive framework for the development and implementation of non-formal education programs in Cameroon. By allocating resources, establishing policies and regulations, coordinating with other stakeholders, and monitoring progress, regions and councils can ensure that non-formal education programs are effective, sustainable, and contribute to overall development goals.

In the final analysis, evaluating an education management information system is critical for ensuring that it is effectively meeting the needs of its users and contributing to the achievement of educational goals. This research study has provided a comprehensive evaluation of the education management information system at the Ministry of Basic Education, highlighting its strengths, weaknesses, opportunities, and threats. The evaluation was conducted using the Ed-QDAF with its 4 policy areas and 19 policy levers. The findings of this study indicate that the education management information system has significant potential for improving the quality of education and supporting decision-making processes. However, several areas for improvement have been identified, including the need for greater user training and support, improved data accuracy and completeness, and better integration with other educational systems. The study also highlights the importance of continuous evaluation and monitoring to ensure that the education management information system remains relevant and effective over time.

# GENERAL CONCLUSION

This research study delved into the evaluation of Education Management Information Systems (EMIS) at the Ministry of Basic Education in the context of non-formal education, in order to identify key factors hindering the production and dissemination of quality data on non-formal basic. This has shed light on the role and impact of technology in enhancing educational management practices. The findings of this study underscore the significance of EMIS in non-formal education settings, offering valuable insights into its effectiveness, challenges, and potential for continuous improvement.

The evaluation revealed that EMIS has proven to be a valuable tool for data management, decision-making, and resource allocation in non-formal education. Its effective implementation could contribute to improved administrative efficiency, enhanced student learning outcomes, and strengthened accountability in the educational sector. By leveraging EMIS, organizations are better equipped to collect, process, and analyze data, enabling evidence-based decision-making and strategic planning.

However, the evaluation also highlighted several challenges faced during the adoption and use of EMIS in non-formal education. These challenges include lack of regional or decentralised EMIS functions, the EMIS is still very much centralised at the Ministry level, the availability of digital devices, administrator's digital skills, and their perception of digital EMIS, insufficient support for technological innovations and limited training opportunities for stakeholders were identified as key barriers to effective EMIS implementation, limited data availability making it difficult to make reliable decisions, inadequate resources including hardware, software, and trained personnel, to operate effectively, poor infrastructure, particularly in rural areas, making it difficult to collect and disseminate data, limited coordination and collaboration between different stakeholders, including government agencies, NGOs, and education institutions which makes it difficult to harmonize efforts and ensure efficient data management.

To address these challenges and maximize the benefits of EMIS in non-formal education, it is essential for the government, educational institutions and policymakers to recognize the importance of investing in digital infrastructure and providing comprehensive training for administrators and educators. Ensuring that EMIS operates effectively and efficiently will required

concerted efforts in; decentralization of EMIS to regional levels, provision of equipment and software to support the functioning of EMIS, strengthening of human capacity and resources, particularly in the areas of statistics and data management.

An education management information system is a valuable tool that can support educational institutions in achieving their goals. Still, its success ultimately depends on how effectively it is designed, implemented, and evaluated. The establishing of a NFE-MIS in the sectorial EMIS will go a long way to solving the problem of lack of quality NFE data. By prioritizing the integration of technology and fostering a culture of continuous improvement, non-formal education the ministry together with stakeholders can harness the full potential of EMIS to enhance educational management practices.

This research study contributes to the existing body of knowledge on EMIS, providing valuable insights that can inform best practices and policy development in the field. It emphasizes the need for collaborative efforts between stakeholders to overcome challenges and create an enabling environment for the successful integration and utilization of EMIS in non-formal education.

The findings of this study reinforce the critical role of EMIS in advancing educational management in non-formal education. By embracing technology, investing in capacity building, and fostering a culture of data-driven decision-making, non-formal education institutions can pave the way for continuous improvement and enhanced educational outcomes for learners in diverse settings. The research outcomes presented here serve as a foundation for future endeavours, guiding stakeholders towards effective EMIS implementation and the pursuit of excellence in non-formal education management.

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# APPENDICES

## APPENDIX 1: Evaluation Form

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**Paix-Travail-Patrie**

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**FACULTE DES SCIENCES DE L'EDUCATION**
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**DEPARTEMENT DE CURRICULA ET EVALUATION**

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**REPUBLIC OF CAMEROON**
**Peace-Work-Fatherland**
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**UNIVERSITY OF YAOUNDE I**
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**FACULTY OF EDUCATION**
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**DEPARTMENT OF CURRICULUM STUDIES AND EVALUATION**

Dear Sir,

I am FOMEN FONKEM EDWIN, a Masters 2 student at the Faculty of Education of the University of Yaoundé 1, Department of Curriculum and Evaluation, specialized in Education Information System and Educational Planning. My research topic is titled **"An Appraisal of the Role of Education Management Information System in Improving the Management of Non-Formal Basic Education in Cameroon".** I plead to take some of your time to answer this evaluation form, whose main objective is to assess the quality of educational data produced by the EMIS at the Ministry of Basic Education in order to identify areas that require improvements.

**NB:** Your response to this evaluation form shall be kept confidential and used for research purpose ONLY.

**Section A: Socio – demographic data**

Title/designation: _____

Working Experience (longevity at current position): _____

Gender: Male ☐ Female ☐

Age group: 30-40yrs☐ 41-50yrs☐ 51-60yrs☐ 61yrs +☐

**SECTION B: SABER-EMIS rubric**

**Instructions: 1 = latent, 2 = emerging, 3 = established and 4 = advanced**

| Policy levers | | Indicators | Description of Best Practices | Scoring | | | | EMIS NFBE Cameroon scoring |
|---|---|---|---|---|---|---|---|---|
| | | | | Latent (1) | Emerging (2) | Established (3) | Advanced (4) | |
| **POLICY AREA 1: ENABLING ENVIRONMENT** | | | **The system contains crucial components of a comprehensive enabling environment, which addresses related policy elements and enables the functioning of an effective and dynamic system** | **The system lacks major componentsof a comprehensive enabling environment** | **The system contains basic components of acomprehensive enabling environment** | **The system contains most components of a comprehensive enabling environment** | **The system contains crucial components of a comprehensive enabling environment** | |
| **1.1** | **Legal Framework** | Institutionalization of system: EMISis institutionalized as an integral part of the education system and the government | There is an existing legal framework to support a fully-functioning EMIS | There is not a legal framework in place | Basic components of a legal framework or informal mechanisms are in place | Most elements ofa legal framework are in place | There is an existing legal framework to support a fully-functioning EMIS | ☐ **1**<br>☐ **2**<br>☐ **3**<br>☐ **4** |
| | | Responsibility: responsibility for collecting, processing, and disseminating education statisticsis given to a clearly designated institution or agency | | | | | | |
| | | Dynamic framework: the legal framework is dynamic and elasticso that it can adapt to advancements in technology | | | | | | |
| | | Data supply: the legal framework mandates that schools participate in the EMIS by providing education data | | | | | | |
| | | Comprehensive, quality data: therequirement for comprehensive, quality data is clearly specified | | | | | | |

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| | | in the EMIS legal framework | | | | | | |
| | | Data sharing and coordination: thelegal framework allows for adequate data sharing and coordination between the Ministryof Education and agencies and/or institutions that require education data | | | | | | |
| | | Utilization: the legal framework emphasizes data-driven education policy | | | | | | |
| | | Budget: the education system budget includes a line item for theEMIS | | | | | | |
| | | Confidentiality: the legal framework guarantees that respondents' data are confidentialand used for the sole purpose of Statistics | | | | | | |
| **1.2** | **Organizational structure and institutionalizedprocesses** | Organizational structure andinstitutionalized processes | The system is institutionalized within the government, has well-defined organizational processes, and has several functionalities beyond statistical reporting | The system is not specified in policies and what exists does not have well-defined organizational processes; EMIS has limited functionalities | The institutional structure of the system is not clearly specified in policies, it has some organizational processes and its functionalities are limited | The institutional structure of the system is defined within the government, it has defined organizational processes, but its functionalities are limited | The system is institutionalized within the government, has well-defined organizational processes, and hasseveral functionalities beyond statistical reporting | ☐ **1**<br>☐ **2**<br>☐ **3**<br>☐ **4** |
| **1.3** | **Human resources** | Personnel: the core tasks of the EMIS are identified and the EMIS isstaffed with qualified people | Qualified staff operate the system and opportunities are available to improve their performance and retention | Minimum standards of qualification arenot met for the majority of staffthat operate the system and opportunities arenot available to improve their performance and retention | Some staff are qualified to operate the system and limited opportunities areavailable to improve staff performance and retention | The majority of staff are qualifiedto operate the system and frequent opportunities are available to improve staff performance and retention | All staff are qualified to operatethe system and well-established opportunities are constantly availableto improve staff | ☐ **1**<br>☐ **2**<br>☐ **3**<br>☐ **4** |
| | | Professional development: professional training is available forEMIS staff | | | | | | |

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| | | | | | | | performance and retention | |
| **1.4** | **Infrastructuralcapacity** | Data collection: tools for datacollection are available<br>Database(s): databases exist underthe umbrella of the data warehouse and have both hardware and software means<br>Data management system: there isa system in place that manages data collection, processing, and reporting<br>Data dissemination: data dissemination tools are availableand maintained by the agency producing education statistics | The system has a well-defined infrastructure to perform data collection, management, and dissemination functions in an integral manner | The system lacks a well-defined infrastructure | The system has abasic or incomplete infrastructure | The system has an infrastructure that allows it to perform some of its functions in an integral manner | The system has a well-defined infrastructure to fully perform its data collection, management, and dissemination functions in an integral manner | ☐ **1**<br>☐ **2**<br>☐ **3**<br>☐ **4** |
| **1.5** | **Budget** | Personnel and professional development: the EMIS budget contains a specific budget for EMIS personnel and their professional Development<br>Maintenance: the EMIS budget contains a specific budget for system maintenance and recurrent costs<br>Reporting: the EMIS budget contains a specific budget for reporting costs<br>Physical infrastructure: the EMIS budget contains a specific | The system budget is comprehensive, ensuring that thesystem is sustainable and efficient | The system suffers from serious budgetary issues | The system has abasic or incomplete budget | The system budgetcontains the majority of required categories to ensure that most parts of the system are sustainable and efficient | The system budgetis comprehensive, ensuring that the system is sustainable and efficient | ☐ **1**<br>☐ **2**<br>☐ **3**<br>☐ **4** |

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| | | budgetfor physical infrastructure costs<br>Efficient use of resources: processes and procedures are in place to ensure that resources are used efficiently | | | | | | |
| **1.6** | **Data-driven Culture** | Data-driven Culture | A data-driven culture prioritizes data as a fundamental element of operations and decision making, both inside and outside of the education system | The system suffers because there is not a data-driven culture that prioritizes data management and data utilization in decision making | The system has adata-driven culture that demonstrates a basic appreciation of data and interestin developing better data utilization practices | A data-driven culture exists that prioritizes data management and utilization within and beyond the education system | A data-driven culture exists that prioritizes data management and utilization within and beyond the education system and evidence of that culture is present in daily interaction and decision-making at all levels. | ☐ **1**<br>☐ **2**<br>☐ **3**<br>☐ **4** |
| **POLICY AREA 2: SYSTEM SOUNDNESS** | | | **The processes and structure of the EMIS are sound and support the components of an integrated system** | **The system lacks processes and structure** | **The system has basic processes and a structure that do not support the components of an integrated System** | **The system has some processes and a structure, but they do not fully support the components of anintegrated system** | **The processes andstructure of the system are sound and support the components of anintegrated system** | |
| **2.1** | **Data architecture** | Data architecture | The data architecture is well-defined to ensure full systemfunctionality | The system's data structure does not have a well-defined data architecture | The system's data architecture includes some components, however, it is incomplete | The system's data structure has mostelements of the data architecture, however, it has some deficiencies that affect the system's functionality | The data architecture is well-defined to ensure full system functionality | ☐ **1**<br>☐ **2**<br>☐ **3**<br>☐ **4** |
| **2.2** | **Data coverage** | Administrative data: the EMIScontains administrative data<br>Financial data: the EMIS | The data in the system is comprehensive and covers | The data in the system is far from Being comprehensive and coverage islimited | The data in the system includes some of the data areas | The data in the system includes most but not all ofthe data areas | The data in thesystem is comprehensive and covers all | |

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| | | contains financial data<br>Human resources data: the EMIS contains human resources data<br>Learning outcomes data: the EMIS contains learning outcomes data | administrative, financial, human resources, and learning outcomes data | | | | data areas | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |
| **2.3** | **Data analytics** | Data analytics | Tools and processes are available to perform data analytics at different levels on a regular basis | There are tools and processes to perform limited tabulations | Basic tools and processes are available, but the system is not capable of conducting advanced analytical steps (e.g., predictive models, projections, etc.) | Tools and processes are available; however, data analytics are not performed regularly | Tools and processes are available to perform data analytics at different levels on a regular basis | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |
| **2.4** | **Dynamic system** | Quality assurance measures: the system is dynamic and maintains quality assurance measures<br>Data requirements and considerations: there are mechanisms for addressing new and emerging data requirements<br>System adaptability: the EMIS is elastic and easily adaptable to allow for changes and/or advancements in data needs | The system in place is elastic and easily adaptable to allow for changes/advancements in data needs | The system in place is not easily adaptable to changes/advancements in data needs, as no quality assurance standards are used | The system in place is not easily adaptable and requires significant time and resources to accommodate changes and/or advancements | The system in place is easily adaptable, but it remains reasonably complex | The system in place is elastic and easily adaptable to allow for changes / advancements in data needs | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |
| **2.5** | **Serviceability** | Validity across data sources: information brought together from different data and/or statistical frameworks in the EMIS is placed within the data warehouse using structural and consistency | Services provided by the system are valid across data sources, integrate non-education databases into the EMIS, and archive data at the service | There are serious issues related to data validity and consistency | There are inconsistencies related to data validity and consistency | The data is consistent and valid; however, some concerns still exist | Services provided by the system are valid across data sources, integrate non-education databases into | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |

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| | | measures<br>Integration of non-education databases into EMIS: data from sources collected by agencies outside of the EMIS are integrated into the EMIS data warehouse<br>Archiving data: multiple years of data are archived, including sourcedata, metadata, and statistical results<br>Services to EMIS clients: Services provided by the system to EMIS clients include ensuring the relevance, consistency, usefulness, and timeliness of its statistics | of EMIS clients by ensuring the relevance, consistency, usefulness, and timeliness of its statistics | | | | theEMIS, and archive data at the serviceof EMIS clients by ensuring the relevance, consistency, usefulness, and timeliness of its statistics | |
| **POLICY AREA 3: QUALITY DATA** | | | **The system has the mechanisms required to collect, save, produce, and utilize information, which ensures accuracy, security, and timely, high-quality information for use in decision making** | **The system lacks mechanisms to collect, save, or produce timely, high-quality information for decision making** | **The system has basic mechanisms to collect, save, and produce timely, quality information; however, its accuracy might be questionable** | **The system has most mechanismsin place needed to collect, save and produce timely, high-quality information for use in decision making; however,some additional measures are needed to ensure accuracy, security,and/ or timely information that can be used for decision making** | **The system has the required mechanisms in place to collect, save, produce, and utilize information, which ensures accuracy, security, and timely, high-quality information for use in decision making** | |
| **3.1** | **Methodological soundness** | Concepts and definitions: data fields, records, concepts, indicatorsand | The methodological basis for producing | The methodological basis for producing | The methodological basis for producing educational statistics | The methodological basis for | The methodologicalbasis for | |

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| | | metadata are defined and documented in official operations manuals along with other national datasets, and endorsed by the government<br>Classification: there are defined education system classifications based on technical guidelines and manuals<br>Scope: the scope of education statistics is broader than and not limited to a small number of indicators (e.g., measurements of enrollment, class size, and completion)<br>Basis for recording: data recordingsystems follow internationally accepted standards, guidelines, and good practices | educational statistics from raw data follows internationally accepted standards, guidelines, and good practices | educational statistics does not follow internationally accepted standards, guidelines, or good practices | followsthe basics of internationally accepted standards, guidelines, andgood practices | producing educational statistics follows most required internationally accepted standards, guidelines, and good practices | producing educational statistics from raw data follows internationally accepted standards, guidelines, andgood practices | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |
| **3.2** | **Accuracy and reliability** | Source data: available source dataprovide an adequate basis for compiling statistics<br>Validation of source data: source data are consistent with the definition, scope, classification, as well as time of recording, referenceperiods, and valuation of education statistics<br>Statistical techniques: statistical techniques are used to calculate accurate rates and derived Indicators | Source data and statistical techniques are sound and reliable, and statistical outputssufficiently portray reality | Source data and statistical techniques lack soundness and reliability | Source data and statistical techniques havebasic soundness and reliability, but statistical outputs do not portray reality | Source data and statistical techniques follow most required elements to be sound and reliable, but statistical outputs do not portray reality | Source data and statistical techniques are sound and reliable,and statistical outputs sufficiently portray reality | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |

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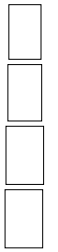
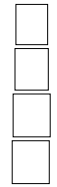
| **3.3** | **Integrity** | Professionalism: EMIS staff exercise their profession with technical independence and without outside interference thatcould result in the violation of thepublic trust in EMIS statistics and the EMIS itself<br>Transparency: statistical policiesand practices are transparent<br>Ethical standards: policies and practices in education statistics are guided by ethical standards | Education statistics contained withinthe system are guided by principles of integrity | Education statistics contained within system are not guided by principles of integrity | Education statistics contained within the system are guided by limitedprinciples of integrity (1 of the 3 principles of professionalism, transparency,and ethical standards) | Education statistics contained within the system are mostly guided by principles of integrity (2 of the 3 principles of professionalism, transparency, and ethical standards) | Education statistics contained within the system are guided by all 3 principles of integrity: professionalis m, transparency, and ethical standards |  **1** **2** **3** **4** |
| **3.4** | **Periodicity and timeliness** | Periodicity: the production of reports and other outputs from thedata warehouse occur in accordance with cycles in the education system | The system produces data and statistics periodically in a timely manner | The system produces data and statistics neither periodically nor in a timely manner | The system produces some data and statistics periodically andin a timely manner | The system produces most data and statistics periodically and ina timely manner | The system produces all data and statistics periodically and in atimely manner |  **1** **2** **3** **4** |
| **POLICY AREA 4: UTILIZATION FOR DECISION MAKING** | | | **The system is wholly utilized by different users for decision making at different levels of the education system** | **There are no signs that the EMIS is utilized in decision making by the majority of education stakeholders** | **The system is used by some education stakeholders, but not for major policy decision making** | **The system is used by most education stakeholders, butis not fully operational in governmental decision making** | **The system is wholly utilized by different users for decision making at different levels of the education system** | |
| **4.1** | **Openness** | EMIS stakeholders: EMIS primary stakeholders are identified and usethe system in accordance with the legal framework | The system is open to education stakeholders in terms of their awareness and | The system lacks openness to education stakeholders in | The system is open to some education stakeholders in terms of their | The system is open to the majority of education stakeholders in | The system is opento all education stakeholders | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | User awareness: current and potential EMIS users are aware ofthe EMIS and its outputs<br>User capacity: EMIS users have theskills to interpret, manipulate, and utilize the data produced by the system in order to ultimately disseminate findings | capacity to utilize the system | terms of their awareness and capacity to utilizethe system | awareness and capacity to utilizethe system | terms of their awareness and capacity to utilizethe system | in terms of their awareness and capacity to utilize the system | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |
| **4.2** | **Operational use** | Utilization in evaluation: Data produced by the EMIS is used toassess the education system<br>Utilization in governance: Data produced by the EMIS is used for governance purposes<br>Utilization by schools: Data produced by the EMIS is used by schools<br>Utilization by clients: data produced by the EMIS is used byclients (including parents, communities, and other actors)<br>Utilization by government: the system is able to produce summative indicators (derived variables) to monitor education system | Data produced by the system is usedin practice by the main education stakeholders | Data produced by the system is not used in practice by education stakeholders | Data produced by the system isused in practiceby some education stakeholders | Data produced by the system is usedin practice by the majority of education stakeholders | Data produced by the system is usedin practice by the main education stakeholders | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |
| **4.3** | **Accessibility** | Understandable data: data arepresented in a manner that is easily digestible<br>Widely disseminated data: education statistics | Education statistics are presented in an understandable manner, are widely disseminated using clear platforms for | The system suffers from serious accessibility issues | The system hasmajor accessibility issues | The system has minor accessibility issues | Education statisticsare presented in an understandable manner, are widely | |

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| | | are disseminated beyond the Ministryof Education and/or the education statistics-producing agency to other EMIS stakeholders<br>Platforms for utilization: platformsare standardized across the EMIS and are customizable to user needs<br>User support: assistance is provided to EMIS users upon request to help them access the data | utilization, complemented by user support | | | | disseminated using a clear platform forutilization, complemented by user support | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |
| **4.4** | **Effectiveness in disseminating findings** | Dissemination strategy: national governments have an information dissemination strategy in place<br>Dissemination effectiveness: dissemination of EMIS statistics iseffective | Dissemination of education statistics via an EMIS is strategicand effective | Dissemination is neither strategicnor effective | Dissemination is reasonably strategic, butineffective | A dissemination plan has been implemented; however, there is room for improvement (forfull effectiveness in relation to strategic engagement) | The dissemination of education statistics via an EMIS is strategic and effective | ☐ 1<br>☐ 2<br>☐ 3<br>☐ 4 |

**THANKS FOR YOUR COLLABORATION**

# APPENDIX 2: Ed-DQAF Grid

| Police lever | | Description of Best Practices | EMIS NFBE | Benchmark | % |
|---|---|---|---|---|---|
| **POLICY AREA 1: ENABLING ENVIRONMENT** | | **The system contains crucial components of a comprehensive enabling environment, which addresses related policy elements and enables the functioning of an effective and dynamic system.** | **16** | **24** | **66.66%** |
| 1.1 | Legal Framework | There is an existing legal framework to support a fully- functioning EMIS | 3 | 4 | 75% |
| 1.2 | Organizational structure and institutionalized processes | The system is institutionalized within the government, has well-defined organizational processes, and has several functionalities beyond statistical reporting | 3 | 4 | 75% |
| 1.3 | Human resources | Qualified staff operate the system and opportunities are available to improve their performance and retention | 3 | 4 | 75% |
| 1.4 | Infrastructural capacity | The system has a well-defined infrastructure to perform data collection, management, and dissemination functions in an integral manner | 2 | 4 | 50% |
| 1.5 | Budget | The system budget is comprehensive, ensuring that the system is sustainable and efficient | 3 | 7 | 75% |
| 1.6 | Data-driven Culture | A data-driven culture prioritizes data as a fundamental element of operations and decision making, both inside and outside of the education system. | 2 | 4 | 50% |
| **POLICY AREA 2: SYSTEM SOUNDNESS** | | **The processes and structure of the EMIS are sound and support the components of an integrated system** | **9** | **20** | **45%** |
| 2.1 | Data architecture | The data architecture is well-defined to ensure full system functionality | 1 | 4 | 25% |

| | | | | | |
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| 2.2 | Data coverage | The data in the system is Comprehensive and covers administrative, financial, human resources, and learning outcomes data | 2 | 4 | 50% |
| 2.3 | Data analytics | Tools and processes are available to perform data analytics at different levels on a regular basis | 2 | 4 | 50% |
| 2.4 | Dynamic system | The system in place is elastic and easily adaptable to allow for changes/advancements in data needs | 2 | 4 | 50% |
| 2.5 | Serviceability | Services provided by the system are valid across data sources, integrate non-education databases into the EMIS, and archive data at the service of EMIS clients by ensuring the relevance, consistency, usefulness, and timeliness of its statistics | 2 | 4 | 50% |
| **POLICY AREA 3: QUALITY DATA** | | **The system has the mechanisms required to collect, save, produce, and utilize information, which ensures accuracy, security, and timely, high- quality information for use in decision making** | **8** | **16** | **50%** |
| 3.1 | Methodological soundness | The methodological basis for producing educational statistics from raw data follows internationally accepted standards, guidelines, and good practices | 2 | 4 | 505 |
| 3.2 | Accuracy and reliability | Source data and statistical techniques are sound and reliable, and statistical outputs sufficiently portray reality | 2 | 4 | 50% |
| 3.3 | Integrity | Education statistics contained within the system are guided by principles of integrity | 2 | 4 | 50% |
| 3.4 | Periodicity and timeliness | The system produces data and statistics periodically in a timely manner | 2 | 4 | 50% |
| **POLICY AREA 4: UTILIZATION FOR DECISION MAKING** | | **The system is wholly utilized by different users for decision making at different levels of the education system** | **8** | **16** | **50%** |
| 4.1 | Openness | The system is open to education stakeholders in terms of their awareness and capacity to utilize the system | 2 | 4 | 50% |

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|---|---|---|---|---|---|
| 4.2 | Operational use | Data produced by the system is used in practice by the main education stakeholders | 2 | 4 | 50% |
| 4.3 | Accessibility | Education statistics are presented in an understandable manner, are widely disseminated using clear platforms for utilization, complemented by user support | 2 | 4 | 50% |
| 4.4 | Effectiveness in disseminating findings | Dissemination of education statistics via an EMIS is strategic and effective | 2 | 4 | 50% |

# APPENDIX 3: Authorisation for research

**REPUBLIQUE DU CAMEROUN**
*Paix – Travail – Patrie*
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**UNIVERSITE DE YAOUNDE I**
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**FACULTE DES SCIENCES DE L'EDUCATION**
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*****
**DEPARTMENT OF CURRICULUM AND EVALUATION**

**The Dean**

**N° 143 /22/UYI/FSE/VDSSE**

## AUTORISATION FOR RESEARCH

I the undersigned, **Professor BELA Cyrille Bienvenu,** Dean of the Faculty of Education, University of Yaoundé I, hereby certify that **FOMEN FONKEM Edwin,** Matricule **20V3264,** is a student in Masters II in the Faculty of Education, Department: ***CURRICULUM AND EVALUATION,*** Option: ***INFORMATION SYSTEMS MANAGEMENT.***

The concerned is carrying out a research work in view of preparing a Master's Degree, under the supervision of **Dr. FONKOUA Paul.** His work is titled ***« The role of education management information system (emis) in improving the management of non-formal basic education in Cameroon ».***

I would be grateful if you provide him with every information that can be helpful in the realization of his research work.

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

Done in Yaoundé, le 02 MARS 2022

**For the Dean, by order**

Le Vice-Doyen
NGO Etienne
Professeur