

DATA QUALITY CONTROL IN EDUCATION MANAGEMENT INFORMATION SYSTEM (EMIS) IN NIGERIA: CHALLENGES AND WAY FORWARD

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Abstract

A major challenge to educational development in Nigeria is the lack of credible and timely data for evidence-based policy making and planning, effective performance monitoring and feedback as well as quality advocacy. Education Management Information System (EMIS) is a system for the collection, integration, processing, maintenance and dissemination of data and information to support decision making, planning, policy-analysis, monitoring and evaluation of all levels of education system. EMIS today in Nigeria is not all about Annual Schools Census (ASC) but about information on the educational system as well as on other system in society related to education but there is challenges encountered in collecting data using education management information system. Using the critical analysis the researcher discovers that there is need for data quality control and invented strategies to enhance data collection in Nigeria.

Keyword: Education management system (EMIS), Education, Data quality control

Introduction

EMIS in Nigeria is considering data collecting system for all education institutions, including demographic information, attendance, course information, financial data, and test results. This is backed up with the existence of EMIS Policy documents which have been approved by the National Council on Education.

The future development of EMIS will depend largely on the successful integration of multiple kinds of data, from multiple sources within and external to the education system, and from multiple levels in the education system. Integration will only be possible if there is compatibility across multiple subsystems and ability of data generating agencies to cooperate with each other to have a single Data collation, processing, Analysis and Dissemination centre.

One of the measures of an efficient education management information system (EMIS) is the extent to which returns from school censuses are accurate, timely and up-to-date. This is important for proper allocation of funding to schools, effective monitoring of learner enrolments and attendance, addressing emerging institutional issues, and providing appropriate information to support planning. Finally, EMIS includes GIS data and catchment community information.

Understanding the concept data quality control

Over the past decades, research organizations, administrations and researchers have been collecting data that describe both the input as well as the output of research. There is need for data quality and provides

methods to assess and improve data quality, in order to obtain data that can be used as a reliable source for quantitative and qualitative measurements of research. Data quality has historically been addressed by controlling the measurement and data collection processes and through data ownership.

Data quality has been defined by Africon Limited/AED. (2003) as the fitness of the data to serve a purpose in a given context, that is, in operations, decision making and/or planning as perceived by its users

Furthermore, Data quality control is the process of controlling the usage of data for an application or a process. This process is performed both before and after a Data Quality Assurance (QA) process, which consists of discovery of data inconsistency and correction. Before: Restricts inputs. Data quality is crucial in measuring and analyzing science, technology and innovation adequately, which allows for the proper monitoring of research efficiency, productivity and even strategic decision making. In this chapter, the concept of data quality will be defined in terms of the different dimensions that together determine the quality of data.

Types of Quality Controls

- **Directive** – designed to establish desired outcomes
- **Preventive** – designed to avoid an unintended event or result at the time of initial occurrence
- **Detective** – designed to discover an unintended event or result after the initial processing has occurred but before the ultimate objective has concluded
- **Corrective** – designed to mitigate damage resulting from data errors

Education Management information System (EMIS)

It is a system of people, technology, models, methods, processes, procedures, rules and regulations that function together to provide comprehensive, integrated set of relevant and timely education data to planners, decision makers and managers of education at all levels (USAID/Malawi. 2009).

It is an education database that aims at ensuring timely, accurate and appropriate education data and information are available for decision making. It is a global concept for educational management that encompasses the application of modern information and communication technology in collection, collation, storage and analysis of education data.

Furthermore, An education management information system is a platform which let educational institutes to manage their data or information at a single place. This system act a data repository where institution can gather, store, and analyse the data, also create various reports which them help in monitor the institution growth & students academic progress in a real-time.

An ideal MIS in education not only help in managing the academic and administrative operations such as payroll management, fee management, transportation management, attendance data but also include learning management features which provide virtual learning space for students.

The education management information system can be used in schools, colleges, and universities with or without much customization. This possibility makes EMIS versatile and easy to implement in any kind of educational institution irrespective of the student strength.

EMIS can be also implemented at group-level in case the organisation has multiple institutions operating under them and even at government level for thousands of schools and colleges under the state or district. Governments are the major implementers of education management information systems to streamline the operations of all schools under and also to gather live data from all schools for decision making.

According to Africon Limited/AED. (2006). **The key lessons in the next section centre on some fundamentals about EMIS, including:**

- EMIS data need to be accurate.
- EMIS data need to be timely
- EMIS data need to be reliable
- EMIS data need to be understandable.

Importance of EMIS

- Facilitates M & E for education system by providing information, which is used to improve efficiency and effectiveness, etc.
- Allows for setting of new policies, and revising old ones, based on evidence instead of self-perceptions.
- Stakeholders such as parents require information about education institutions and student outcomes in order to make decisions about education choices and opportunities
- Strengthens capacities in collecting, processing, storing, analysing management, planning and dissemination of information at all levels of the education system
- Coordinates, disperses and makes efforts to acquire, process, analyse and disseminate all education management information
- Decision makers need to understand how resources are translated into learning outcomes, especially the efficiency and effectiveness of existing processes.
- Helps provide analysts and decision makers with information to understand how educational inputs are transformed into educational outputs.
- Access to quality and timely data helps improve decision-making and ensure that limited resources target areas in most need and where returns will be highest

Purpose of EMIS

Educational institutions derive a lot of benefits from EMIS software. According to AED. (2010) The availability of all operational data at a single place makes the educational management information system the go to tool for all management related decision making. Along with decision making, the EMIS software helps in all other operational aspects of the educational institution which is listed below:

- Education Management Information System (EMIS) is a system specially designed for the collection, integration, processing, maintenance and dissemination of data and information to support decision making, planning, policy-analysis, monitoring and evaluation of all levels of education system.
- It is also designed strengthen the education statistical system in Nigeria by linking and assembling different existing information systems, integrates and synthesizes them in one single system of all education data both the quantitative and qualitative.
- It produces more relevant, reliable and timely data needed at every tier of government for strategic planning, policy formulation and decision support initiative in education in Nigeria.
- EMIS is the backbone of modern education. It allows schools to store valuable student information and helps administration manage the school and the district as a whole. If the use of EMIS benefits one division of education, then it will benefit the entire educational system.
- **Parent-teacher communications**

With EMIS the teachers got the right tool to send instant communications to parents regarding the academic and non-academic activities of the students. This tool provides a platform also for parents to share instant feedback to teachers.

- **Fee collection management**

Revenue from fee collections is the main source of income for most of the schools and colleges. So it is critical to have software to manage fee creations and automate collections. By regularly sending alerts to parents regarding the upcoming fee due dates and collecting fees online through payment gateways, EMIS works as a backbone in the running of educational institutions.

- **Admission & enquiry information management**

It is primary to the schools and colleges to either maintain or increase the admission intake year on year. More than the numbers, the quality of admissions also matters in achieving the academic goals of the institution. This can be simplified and automated using EMIS software. Along with admission, it can help in the enquiry management which happens throughout the year regardless of the admission season.

- **Examination management**

Examinations are the core of academic activities. The management information system automates this process by scheduling online examinations and publishing results with minimum effort from teachers. The generated grade books will be shared to parents for review and feedback.

- **Student Information Dashboard**

All student information related details will be available at fingertips for teachers as well as parents. These include various information like the historic data of academic performance, attendance data, fee payment data, disciplinary data, etc. and also different reports regarding students will be available on the student information dashboard.

- **Timetable management**

All the schedules regarding operating the classes and exams in different classrooms will be provided by the EMIS in the form of class timetable, teachers timetable and institution timetable. These can be printed out or directly accessed from the mobile app or web dashboard to plan for the day and week.

- **Payroll & leave management**

The human resource management module available with EMIS takes care of the payroll and leave data of teachers and other faculty. This provides a single place for teachers and faculty to apply for leaves and access payslips.

- **Lesson plans & assignments**

The EMIS provides modules for teachers to share lesson plans to students and parents in advance and also to accept assignments from students. With these kinds of modules, the EMIS provides a backbone for learning activities also.

- **Transportation management**

It includes the functionality to manage the entire transportation of the institution. Various information like driver and bus details, bus timings, bus route etc. will be shared with parents as live alerts. This improves the safety of the institution and reassures the role of EMIS as the backbone.

- **Library management**

The library is one of the most used facilities in the institution's campus. With the library data also available in the EMIS, students and teachers can browse the available books from outside the campus, also improving the efficiency as well as the tracking of issued books.

Challenges of EMIS

Most countries with an EMIS struggle with sustainability issues, such as: incompatibility with existing systems, poor customization of new systems, staff capacity issues, limited financial resources, or limited government commitment.

Education Management information system is playing an important role in planning, decision making and monitoring of the schools but there are considerable limitations and challenges across EMIS cells in terms of the use of technologies in education management and decision making.(Akbar, Fahim.)

Mechanisms or Components of EMIS

- An EMIS is a system that encompasses:
- The collection of Data
- Integration of data
- Processing of data
- Maintenance of data
- Dissemination of data and information to support decision-making,
- Policy-analysis and formulation,
- Planning, monitoring and management at all levels of an education system.

What EMIS DATA should Measure

Education management information systems (EMIS) provide quality data that facilitate better education system planning and policy dialogue. All EMIS work is composed of three basic components: people, process, and technology (Drew Douglas).

Therefore a comprehensive EMIS should Measure not only administrative and pupil data but also financial human resources and learning data. Others include Pedagogical materials, Institution details, Students;Enrollment, attendance, drop-out rate, ethnicity, Gender, Grade level, Perceptions of Staff, Finances, Infrastructure and facilities.

Challenges of EMIS Development

Even though most countries in the Asia-Pacific region have set up EMIS to collect, store, analyse and disseminate education data as a pillar of their decision-making processes, various challenges exist to monitor progress with SDG 4. Before we discuss how to ensure the development of an effective EMIS, we will look at the common challenges we will encounter so we are better prepared to deal with these challenges when they arise.

i. Lack of political commitment

The main limitation relates to lack of recognition on the need to establish an effective EMIS system that focuses on all aspects of collection and dissemination of reliable and quality data to meet the requirements of both good governance and the needs of monitoring all the targets and indicators of SDG 4.

ii. Qualified personnel

Hiring highly competent professional staff to work with an EMIS can be an issue because of government service rules. Deciding upon a high pay scale to attract competent professionals does not necessarily result in actually hiring personnel with such a competence due to promotion rules in ministries. Senior positions are too often filled according to seniority of

service and not competence.

iii. Obfuscation in roles and responsibilities

Data duplication and multiple data producers in the education sector without proper coordination is another challenge. In many countries, there is a lack of clarity in collecting, processing, disseminating and the sharing of data among different data producers.

iv. Limited data coverage

Basic education is the only area where almost all Asia-Pacific countries have a decent system to collect data through EMIS. In many countries, higher education, NFE and Early Childhood Education (ECE) are not part of EMIS. The lack of holistic data collection systems in education sub-sectors and challenges in some phases of the data production cycle hampers countries from generating the necessary indicators.

v. Dearth of disaggregation to measure equity

EMIS does not include all the needed equity disaggregation required for SDG 4 planning and monitoring. In order to better identify the dimensions of disadvantage in education and measure inclusion, efforts should be made to increase the capacity of EMIS to disaggregate data where relevant by sex, age, location, ethnicity and disabilities.

vi. No culture of data sharing and cooperation

Although many types of data and indicators are collected by different departments and ministries, it has been determined they are not shared, or access is barricaded. A culture of data sharing and establishing cooperation among data producers is crucial for effective monitoring of Education 2030 and the world development agenda. Information from national statistical offices and other non-traditional education providers, who might collect data on aspects of education not covered by the traditional education providers, should be taken into consideration to fill the data gaps.

vii. Lack of resources

Due to heavy budget constraints, countries may prioritise scarce resource areas such as teacher training and direct allocation to facilities in educational institutions. It may be difficult to find adequate resources to meet the requirements of establishing an effective EMIS, which will not only require the hiring of well-paid professional staff, but also the purchase of expensive digital hardware and software.

viii. Inefficiency in data collection, processing and dissemination

The collection, processing and dissemination of data is still very inefficient in many countries. Many countries still use paper-based data collection methods and verification and validation processes and manuals. Many countries are still not able to exploit the benefits of technologies in data management due to a lack of funds, or due to a lack of skills and capacity.

ix. Lack of capacity in analysis and use of data

Though data is collected through EMIS, many data is not analysed, or used for planning, management and monitoring – mainly due to a lack of capacity in the staff tasked with proper analysis and the use of data.

x. Staff turnover

In many countries, EMIS staff are scarce and their high turnover can negatively impact on

institution memory. This means that each time an EMIS staff member leaves, the acquired knowledge and skills also leave with the departing person. An added issue is that a new recruit needs to be trained and this requires a trainer with EMIS knowledge and skills.

Way Forward of EMIS in Nigeria Educational System

- **Ministerial Strategic Plan**

In order to move forward the education system in Nigeria, and in line with the Sustainable Development Goals, Goal 4, the Honourable Minister of Education, Mallam Adamu Adamu, launched a Strategic Plan to guide the sector. This Strategic Plan has education data and planning as one of its ten pillars which its implementation will address the data and EMIS challenges. Generally all the pillars are geared towards achieving SDGs Goal 4. According to (Washington, D.C.: EQUIP2 Malawi).

What EMIS Stands to achieve

- It will tackle the issue of the out-of-school children by creating opportunities and providing incentives;
- It will seek to bridge the gender gap in enrolment, retention and completion by addressing the problems of girl-child education
- It will address the crises of the inadequacy and low-quality teachers with training, re-training, and recruitment
- Addresses the issues of quality and access to higher education and resolve the skill gap by deploying a workable and comprehensive technical and vocational education and training.
- Expected improvements in the quality and quantity of physical infrastructure for teaching and learning.
- The provision of state-of-the-art learning resources and other instructional materials.
- Incentives of critical high-demand courses and programmes (STEM and teacher training courses)
- Putting in place a formidable monitoring and evaluation system for efficient result.

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