

## The power of data: enhancing transparency in the education sector in Sierra Leone

The best defence against malfeasance are reliable facts and figures. An effectively functioning Education Management Information System can highlight malpractices related to anything from local record keeping, teacher salaries, building new schools, and educational indicators. The cost of setting up such a system will be justified by the easily quantifiable benefits it can provide.



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### What is an Education Management Information System (EMIS)?

A management information system *informs* management. An education management information system (EMIS) informs the management of education processes. Here, the idea of *informing* has a wider meaning: not only does it include the provision of data (such as number of textbooks by grade and subject), but it also synthesises such data items into new structures, generating information in the process. For example, the data items ‘number of text books’ and ‘pupil enrolment’ maybe used to calculate a pupil/textbook ratio. Similarly, by using ‘number of teachers’, a teacher/pupil ratio can be arrived at. These are commonly used ratios (among several others) to indicate the level of input into a country’s education system, thus, they are important for policy makers and planners.

There are typical data items found in any EMIS: number of schools, teachers, pupils, disaggregated by gender, levels of administration (region, district, etc.), educational institution (primary, secondary, etc.) and ownership (government, private etc.), to name a few basic ones. However, policy makers and planners can expect more from an EMIS; but they need to guide the EMIS in what this ‘more’ should comprise. This requires the existence of an educational model that shows a desired goal and the factors that contribute to the achievement of the goal.

In a post-conflict country, such an educational model would typically be of an ‘input-type’, meaning the more input resources (more access, more schools, more teachers, more textbooks, etc.) the better the education system. Over the years, this model would probably evolve to put more emphasis on output (examination marks) and teaching and learning processes (e.g., quality of teaching, motivation of students).

Just as policy makers and planners can expect information from an EMIS, they also need to guide the

The bloody conflict that ravaged Sierra Leone until 2002 devastated the country’s infrastructure, including its schools. In the Eastern Region, the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) reported a damage index of 4 (the highest possible) in a survey of primary schools in 2003 (OCHA, 2003). Not only was physical infrastructure destroyed, the capacity (human, organisational, and institutional) of government and government institutions was also reduced significantly and remains at low levels today.

Although the post-conflict period ended officially in 2006, the Ministry of Education is still not able to effectively monitor teaching and learning processes nationwide. A lack of accurate, reliable and timely data has resulted in poor monitoring and corrupt practices. Record-keeping at school level, to give only one example, is a particularly problematic area. The system records teachers who do not physically exist, teachers that do not teach (‘ghost teachers’), and teachers receiving salaries from several schools. Student enrolment numbers are routinely inflated in the records.

In mid-2006, the UNESCO Institute for Statistics (UIS) placed two experts in the Planning Directorate of the Education Ministry in Sierra Leone’s capital, Freetown, to set up an Education Management Information System (EMIS). This U4 Brief explores the features of such a system and the benefits of introducing it to support efforts to curb different forms of malpractice in the education sector.

EMIS on the factors that need measuring, that is, the scope of its data items. Presentation of information is crucial for interpretation and understanding. Historically, data has been presented in the format of tables. In principle, there is nothing wrong with this, as it is the only way to present large amounts of data. However, if we know the interests of the reader in specific aspects of data, such can be presented graphically, with unnecessary detail removed. If geographical co-ordinates for schools and population centres are kept in the EMIS maps, they can be produced to show their location and size. This geographic aspect greatly assists in the preparation and implementation of the educational planning processes, as it answers questions like: Are primary schools evenly dispersed among population centres? Are secondary schools evenly dispersed among primary schools? What is the maximum distance pupils have to cover to reach their school?

## Who benefits from EMIS data?

In so-called Less and Least Developed Countries governments are encouraged to adopt strategic plans like an Education Sector Plan (ESP), a Poverty Reduction Strategy Paper (PRSP) and other plans, whose implementation often depend a great deal on funds from partners in national development. Such partners (the donors) have naturally a great interest in ensuring sufficient (in scope, accuracy and timeliness) data is available. Reliable information on the performance of the sector is the key to realistic goal-setting, better management and greater accountability. Without relevant accurate data all the stakeholders in the sector are flying blind: what does not get measured will not get fixed.

In order for planners to shift from short-term crisis management to long-term planning strategies one of the first tasks must be to ensure a well-functioning EMIS is in place. As long as ad-hoc decisions are routinely made due to lack of systematically gathered information, transparency can not be achieved.

The EMIS unit is often organisationally placed within the Planning Directorate of the Ministry of Education. This may be the best solution in the early implementation stages when the scope of data items in the EMIS are limited to the most basic ones, and when data accuracy and reliability are more often than not doubtful.

As the scope of data items in the EMIS increases to include financial and socio-economic data, an increasing variety of users begin to emerge: first from within the Ministry of Education, then from other Ministries and institutions. Major EMIS users include the Ministry of Finance, which has an interest in statistics of all Ministries, the Ministry of Labour (representing the market absorbing school leavers) and the national statistical office. International actors have a stake in the EMIS as well. Monitoring progress toward Millennium Development Goals (MDG's) and Education for All (EFA) programmes requires efforts by international organisations which in turn rely on national data. UNESCO and the World Bank are only two of such organisations at the forefront of pursuing international data and making them comparable.

Briefly, we have seen examples of what can be expected from an EMIS. In summary, an EMIS “should generate information for users in the following essential fields:

- Management and administration of the education system,
- Research on and planning of the education system (macro and micro),
- Monitoring and evaluation of the education system.”

*(Carrizo, Sauvageot and Bella, 2003, p. 17)*

One should expect that these functions are carried out in a transparent manner at all levels, but practical experience tells us that this has not been the case. Therefore, an EMIS can be useful in detecting corrupt practices in an education system as the case of Sierra Leone shows.

## Establishing an EMIS in Sierra Leone

At the time the EMIS was established at the Planning Directorate of the Education Ministry in Sierra Leone, no credible data existed regarding the number of schools, teachers and pupils. The teachers' payroll was believed to be seriously inflated. Between 2001 and 2005, several attempts to carry out a comprehensive school census were made, with and without external assistance, but none was regarded as a success. In retrospect, the main reasons for failing were that a) no education experts were involved in planning and implementation and b) the statistical methods employed were not sound enough.

By the end of 2006, the newly formed EMIS unit had set up a computer system based on proven UIS software. The first Annual School Census took place in January 2007. In preparation for the survey, school principals – the census' respondents – were sensitised on the importance of national education data and were trained in filling in the questionnaires. They then reported such questionnaires to EMIS staff deployed in fifty centres in the country – hence this first EMIS exercise relied on the accuracy of data provided by school principals.

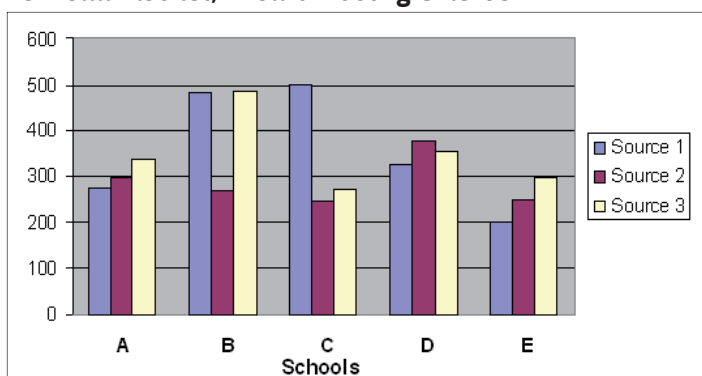
After the census, while data entering from the questionnaires into the computer system was going on, random checks at schools and comparison with data from other sources (specialised UN organisations, non-governmental organisations) were taking place. Although coverage of schools was generally satisfactory (between 96% and 98%, depending on school level), the accuracy of some of the returned data was less impressive.

The chart on the next page illustrates the problem of student enrolment data in five primary schools in one of Sierra Leone's districts (Tonkolili) as an example. 'Source 2' is the EMIS Annual Census 2006/07. The other sources stem from different organisations operating in that particular area.<sup>1</sup>

The data for School A are what one would expect, considering the differences in time when data was

<sup>1</sup> Source 1 collected data a few months before Source 2 (EMIS Annual Census). Source 3 collected their data some months after.

## 2006 / 07 Enrolment in five primary schools Tonkolili District, Kholifa Mabang Chiefdom



collected. The data for School B is problematic, and at a first glance it appears that the problem lies with Source 2 (EMIS), reporting almost only half of the enrolment that Sources 1 and 3 do, which show practically identical figures. Since deliberate under-reporting by school principals is extremely unlikely, this case was further investigated by the EMIS unit, with a surprising result. There was, in fact, some slight over-reporting by the school principal, with gross over-reporting by Sources 1 and 3, in all likelihood colluding when reporting their data.

Data for School C are in line for Sources 2 and 3, with apparent gross over-reporting by Source 1. Data for Schools D and E appear to be reasonably in order, although the EMIS figure for School D may point to some over-reporting.

On the whole, the EMIS data on enrolment appear to be overstated, taking into account results from random checks and reports from other sources. Since the latter seem to be flawed themselves, it is difficult to state the extent of the problem until more data is collected. This example shows that a functioning EMIS reveals not only problems in the Ministry of Education but also those of other stakeholders in the sector.

Another major source of concern is the teachers' data. Following the analysis of the results of the 2006/07 school census, the EMIS unit drew up a comprehensive concept for carrying out an exercise to improve the quality of teachers' data. The concept was presented to, and subsequently funded, by development partners. The main components of this concept are (based on the Annual School Census):

- a physical head count of teachers,
- Reconciliation of data from the teachers' head count, the Ministry's Records Section and the Teachers' Payroll,
- streamlining the Teachers' Management System, including the recruitment process of teachers (not actually part of the EMIS, but included to improve the current system),
- modernisation of the Teachers' Records Section in two phases:
  1. Overhaul of workflows, computerisation and capacity building
  2. Improving the physical structure (fireproofing, electrical wiring, air conditioning, and

- although not within the realm of the EMIS unit, the concept suggests the inclusion of a component for Teachers' Development.

The physical head count of teachers started in July 2008, and presented a logistical challenge. Unlike the School Census with paper-and-pen based capture of field data, teachers' data will include a digital portrait image (for the subsequent issue of an identification pass), scanned digital images of certificates and digitised thumb prints.

To minimise the danger of fraud (persons who are not teachers presenting themselves as such), the counting and registration exercises will take place near the schools, at chiefdom or at least district levels, under the watchful eye of representatives of communities and local authorities. The recording of digital thumb prints is expected to weed out those teachers who are presently registered at several schools (such cases are known), therefore receiving as many salaries.

The choice of number and location of registration centres where counting and registration of teachers takes place presents a dilemma: on the one hand, as many registration centres and as close to schools as possible are desirable. On the other hand, the number of sets of specialised computer equipment to capture data (laptop, digital camera, scanner, biometric unit) is limited by budget constraints. Additionally, many locations can only be reached by either a four-wheel drive vehicle or a motorbike; both options are not feasible for financial or practical reasons.

The exercise hopes to eliminate, or at least to minimise, the number of teachers who are presently kept:

- in the school's records but should not be,
- in the Ministry's Teachers' Records Section but should not be,
- in the Teachers' Payroll but should not be.

At the same time, corrections can be made, where necessary, in respect of the level of qualification and length of service (affecting terms of employment) and year of birth (affecting retirement).

The establishment of whether a teacher is a bona fide teacher is in no way trivial. Some may have been hired and employed by a school, but not yet appointed by the Ministry. Others might have been employed by a school but may have never been appointed (as in the case of a school that is neither government-assisted nor government-owned). Teachers may or may not be already teaching, and often they are not aware themselves of the intricate details of teacher recruitment and in what stage their application for employment may be at the specific time of the teachers' head count.

The examples we have seen so far refer to possible malpractices of teachers' individual data.

Some cases exist where the total number of teachers quoted by a school is understated in one of its reports (for the purpose of requesting more teachers) and overstated in another one (for the payroll). Such cases are rarely detected because of irreconcilable manual record-keeping systems.

Records pertinent to the calculation of salaries

originate in the Planning Directorate of the Education Ministry and are sent to the Ministry of Finance for payroll processing. Even the simplest audit check, like comparing the number of salaries paid out in a specific month with the number of salaried teachers in the EMIS, is presently not possible. Plans are underway to increase the scope of the EMIS to include financial data on school and teachers' management, which will effectively assist in reconciling payment and audit of teachers' salaries.

Much could still be said about teachers' data. Its transparency is at a notoriously low level. At the same time, in Sierra Leone the teachers' component is one of the largest (35%) of the civil service payroll (Ministry of Finance, 2006). Interested parties (Ministry of Finance, Ministry of Education, teachers, Teachers Union, etc.) view each other with suspicion because of the large sums of money that are thought to change hands improperly. Any attempt to raise transparency to a higher level is viewed with equal suspicion, and is thus not always supported. Therefore the best defence against malfeasance are reliable facts and figures.

Less spectacular than financial aspects of the Teachers' Payroll, but equally important for teaching and learning processes, is the proper management and administration of school resources and teaching and learning materials. Timely, and in correct quantity, delivery of text books to schools and ensuring their proper use is a prime example. We can expect information from an EMIS that this is indeed the case, or to what extent it is so.

## Why carry out an EMIS?

This brief has shown that an effectively functioning EMIS can highlight malpractices in the areas of:

- management and administration:  
e.g., record keeping at school, district and headquarter level; management of teachers' salaries, school fees and school resources.
- research and planning:  
e.g., setting up of new schools and expansion of existing schools in improper places, and
- monitoring and evaluation:  
e.g., educational indicators.

There are compelling reasons why an effective EMIS should be put in place; indeed the Return on Investment is excellent. One World Bank financed study for the Ministry of Education, Grenada (West, 2003) lists Productivity Based Benefits, Efficiency Based Benefits and Operational Savings against Costs and arrives at

a Payback Period of 1 ½ years. In these calculations, there are no provisions for capacity building, and initial investment is low because of existing infrastructure, which may be too optimistic for situations in developing countries. Nevertheless, the study shows that benefits of an EMIS can be quantified, justifying its introduction.

In the case of Sierra Leone, linking the EMIS with an intervention for a sustained improvement of the school inspectorate would result in large savings due to better use of resources and more efficient distribution of text books and teaching and learning materials. Implementing the exercise for improvement of the quality of teachers' data is budgeted at around USD 2 million, which is slightly less than teachers' salaries for one month in the whole country. Assuming that the exercise results in savings of only 6% (double that or more is likely), the cost would be recouped in less than two years.

Several reasons have been given why an EMIS can effectively enhance transparency and reduce corruption in the education sector. For it not to turn into a 'paper tiger' those who provide external assistance in the initial stages have to ensure that full ownership is transferred to the Ministry of Education, who must be able to sustain its operation in the long-term. Development partners must not fall into the trap of subsidising recurrent expenditure at a level that the Ministry cannot keep up with after their departure. Payment of salaries of experts are a particular challenge. A possible way to overcome this is to commit the Ministry to provide sufficient staff members right from the beginning, whose capacity must be built by the development partners. ■

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