

WORKING PAPER NO. 5**Education Management
Information System: A
Short Case Study of
Nigeria**

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WORKING PAPER NO. 5, 2006*About infoDev's working papers series:*

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Establishing effective working relationships between three management layers presents a significant challenge for the development of education management information systems in Nigeria and, in common with other developing countries, there are issues of capacity and commitment. Structures and responsibilities for EMIS are complex, reflecting historical developments and more recent imperatives.

The logo for infoDev, featuring the word "infoDev" in a white, lowercase, sans-serif font. Above the letters "i", "n", "o", and "D" are several small white dots of varying sizes, arranged in a slightly curved line.

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Education Management Information System: A Short Case Study of Nigeria

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Executive summary

Establishing effective working relationships between three management layers presents a significant challenge for EMIS development in Nigeria and, in common with other developing countries, there are issues of capacity and commitment.

At state level, a systematic approach to educational planning, supported by EMIS, is now developing with a clearer role for the federal government in the support, co-ordination and monitoring of state-level EMIS. However, a lack of reliable baseline data constrains realistic targeting of indicators.

Structures and responsibilities for EMIS are complex, reflecting historical developments and more recent imperatives but improved synergy between existing agencies is being sought through a new national body.

Due to a lack of resources, early EMIS work was incomplete and not sustained whilst later activity, with private sector implementation, gathered much data but developed little capacity. More recently, development of standardised software augurs well for state-level EMIS to provide comprehensive information in support of decentralised management.

Until recently, data collection issues have eroded stakeholder confidence but current developments are designed to improve data quality and utility although changes in school and cycle structure will pose significant data collection challenges. Data on population and finance are limited in quality and quantity.

The evidence shows that EMIS data has not played a significant role in supporting the planning process at the Federal level. However, with the process of decentralisation states are becoming more committed to supporting localised EMIS and some are using data to prepare education plans and develop their budgets. Nevertheless, decentralisation of EMIS has only been piloted in a small number of states and time will tell if this approach is sustainable across the country.

One of the important lessons from the experience of Nigeria is the important facilitation role that the Federal Ministry of Education is now playing to support the implementation of a common EMIS approach at the state level. This involves the development of a single software system in order to store and manage education data. States have also benefited from a comprehensive capacity building initiative to improve skills at the local level and to encourage data utilisation. In addition the Federal Ministry has helped establish a centralised depository to support the collection and amalgamation of all previous census data.

A new EMIS infrastructure, with web-based networks and appropriate software, is now well-developed and ready for adoption in an increasing number of states to improve information quality for stakeholders.

Donors continue to fund most EMIS activity and challenges remain for hardware maintenance and energy supply in states lacking development partner inputs.

States are becoming aware of the benefits of EMIS but there remains some doubt about government's commitment to open accountability.

1. Introduction

- *Establishing effective working relationships between three management layers presents a significant challenge for EMIS development in Nigeria*
- *In common with other developing countries, there are issues of capacity and commitment*

In Nigeria EMIS plays a minimal role in supporting planning at either the federal, state or local government levels. However, it would be wrong to assume that EMIS is not used in the planning process since it is beginning to play an important role in facilitating the preparation of strategic plans at the state level. Moreover, the government has a clear understanding of what role EMIS will play in future planning activities, both at the federal and state levels. Despite the good intention of government it is difficult to establish accurate quantitative targets for future plans due to the lack of adequate base-line information.

For the outsider it is difficult to understand how the education management information system operates due to the different layers of government involved in the collection and collation of education data. For instance, the Federal Ministry of Education, the state Ministries of Education and the various local government education administrations are all involved in the collection and collation of data. The relationships between the different layers of government are defined in legislation but in practice this often becomes blurred. All of these relationships impact on how data are collected, collated and analysed, including who is responsible for each of these activities. In reforming its EMIS Nigeria also faces similar problems to those experienced by other countries, including a lack of capacity, limited commitment from stakeholders and difficulties associated with the collection of survey data.

Given the complicated environment in which data collection takes place and the politics surrounding federal-state relationships, the government faces an enormous challenge to develop an EMIS capable of capturing the inputs and outputs to the education system, not to mention issues associated with measuring the efficiency of resource allocation. The government and donor community recognise these challenges and have embarked on a series of major reforms, including the development of structures to improve coordination at the federal level and to focus resources on creating a sustainable EMIS at the state level. For instance, a centralised national EMIS committee was established to avoid fragmentation and ensure that data collection and collation takes place in a coordinated manner. However, on the downside, most of these reforms have been donor driven and the degree of support from the Federal Ministry of Education is questionable. Nevertheless, following the successful pilot of EMIS at the state level a decision has been made to extend this decentralised approach to a further nineteen states during 2006. This offers lessons for other developing countries who are attempting to reform their EMIS in an

environment where political tensions exist between central and local government levels.

Moreover, the approach to developing IT infrastructure can be viewed as an example of best practice, offering solutions for a large developing country about to embark on the technical reform of their EMIS.

2. Objectives and Functions of EMIS

- *At state level a systematic approach to educational planning, supported by EMIS, is now developing*
- *The role of the federal government in the support, co-ordination and monitoring of state-level EMIS has been clarified*
- *A lack of reliable baseline data constrains realistic targeting of indicators*

At present, EMIS plays a minimal role in the planning process at federal, state or local government level¹. However, it would be wrong to assume that EMIS is not used by governments at different levels to inform policy. At present there have been limited attempts in Nigeria to develop specific targets for education policies based on accurate or base-line data or, until recently, to determine the role of the three different government layers in this process. With a lack of guiding principles or strategies the State Ministries of Education and the Local Government Education Administrations have to “*fill in the gaps themselves*”.

However, the World Bank is attempting to support a more systematic approach to planning at the state level and, with the support of development partners, is encouraging states to develop Education Strategic Plans (ESP). This reform is an attempt to encourage a move towards a sector-wide approach and could result in budget level support. The Education Strategic Plan is a forward-looking strategy, based on declared targets and policies that will help the state’s drive for poverty reduction. The first state to produce a draft Education Strategic Plan is Kaduna. Besides state-level EMIS, a number of processes had an input into this strategic plan, including the Kaduna Education Summit held in July 2005, the Kaduna State Economic Empowerment Development Strategy (SEEDS) presentation of 2004, together with Federal and State Government commitment to key education policies, such as Universal Basic Education (UBE) and Education for All (EFA). The draft ESP contains clear objectives, indicators, baselines and targets. The state EMIS has been used in this process to generate base-line data and there are plans for EMIS to play a more important role in the monitoring process.

¹ Under the constitution federal and state governments are jointly responsible for primary education. The federal government formulates national policy, coordinates policies, sets standards and is supposed to monitor performance. State governments are responsible for the design, development and delivery of this service, including the development of the curriculum and preparation of legislation, while local government is responsible for the provision of primary education. Outside of primary education, all secondary provision is managed and financed by state governments. Finally, higher education, including colleges of education, the universities and polytechnics, is the responsibility of the Federal Ministry of Education.

The government also has a clear understanding of what role EMIS will play in future planning at the national level, especially with regard to the process of establishing base-line data and the monitoring of future goals. A brief look at some of the future government proposals will illustrate the role EMIS will play in the future policy processes. The Nigerian government is committed to Education for All (EFA) and the Millennium Development Goals (MDG). This has resulted in the establishment of a National EFA forum, as well as EFA forums in all states. The outcome from this process has involved the development of a number of MDG indicators for Nigeria (see Annex II). For each of the MDG targets EMIS will provide an important role in helping the Federal Ministry of Education to monitor progress towards targets. Similar targets have been established for secondary education and non-formal education. The government has also generated a number of key Universal Basic Education indicators that will also be monitored and EMIS will play an important role in this process (see Annex III).

The common feature of the EFA indicators and UBEC indicators is the lack of adequate base-line information, all of which make it difficult to establish realistic quantitative targets for future strategies. However, given the lack of any national action plan or strategic plans it is easy to understand why no targets have been established. In response to these concerns the government is supporting an analytical piece of work that will highlight key data issues and help different government layers to develop their strategic plans.

3. Location of EMIS

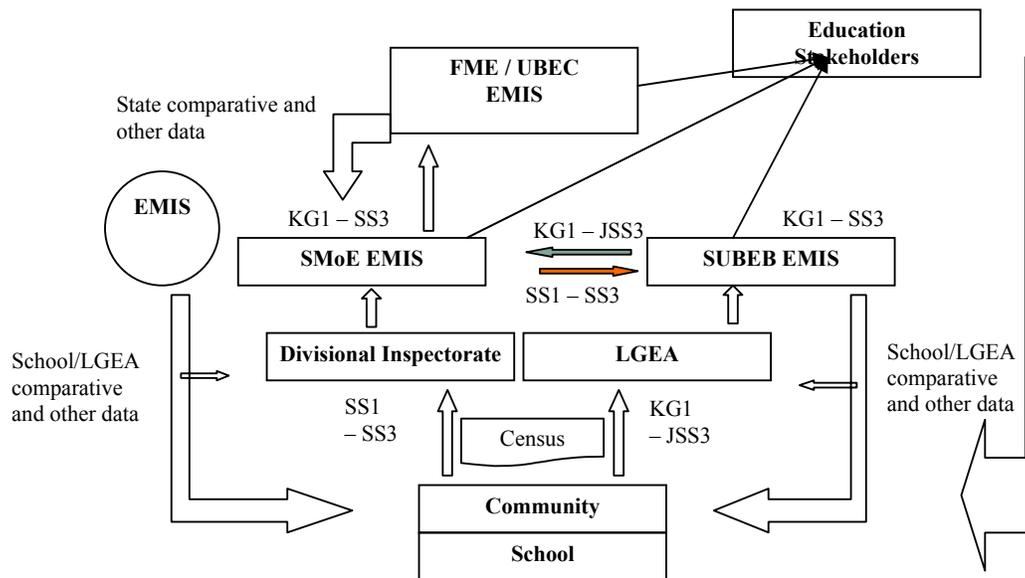
- *Structures and responsibilities for EMIS are complex, reflecting historical developments and more recent imperatives*
- *Improved synergy between existing agencies is being sought through a new national body*

In Nigeria there are two parallel EMIS. Initially, a number of federal agencies, many of whom had state and local level subsidies, were responsible for EMIS. However, as the Universal Basic Education Commission developed their own indicators, they also established their own monitoring systems. In June, 2004, attempts were made to improve data coordination through the establishment of a national EMIS committee (NEMIS). It was anticipated that the NEMIS will help improve coordination of data collection activities and to define the role played by the different structures in this process. The committee comprised representatives from government departments and major development partners, but not state level MoE, State Universal Basic Education Boards and Local Government Education Authorities. The exclusion of the former government bodies is strange in the light of the fact that they are responsible for the data collection.

The national committee for EMIS was also given responsibility for the Education Data Bank (EDB), a body that was originally established in the late 1980s as an education data depository unit. The EDB is fed with information from state level education management information systems, as well as from the information systems located in the State Universal Basic Education Board. However, the existence of two

parallel EMIS still results in coordination difficulties, especially with regard to the duplication of data collection activities in a single state.

In an attempt to improve synergy between the parallel EMIS systems, the national committee for EMIS established a sub-committee to identify areas of overlap and to make recommendations to streamline the collection of education data throughout Nigeria (see diagram above). This sub-committee recommended that the State Ministry of Education should become the primary custodian of EMIS and the major depository for all education data. As a consequence, the Federal Ministry of Education has established an EMIS task force to support future developments in EMIS at the state level. Under this proposal the national EMIS committee, in conjunction with the National EMIS taskforce, will facilitate the implementation of an EMIS in each state. The task force comprises representatives from the Federal Ministry of Education, Education Data Bank, and Universal Basic Education Committee EMIS, and their role is to support all aspects of EMIS implementation in each state. This will involve creating awareness about the importance of data in the planning process at local level, especially with regard to cooperation with local government and civil society. Each state EMIS taskforce will report to a state EMIS coordinating committee, comprised of senior decision makers from the State Ministry of Education and other education stakeholders, most notably the State universal basic education board. This approach to supporting the development of EMIS has proved successful in Kano state and there are plans to extend it to twenty-one additional states during 2006.



4. The development of EMIS system in Nigeria

- *Due to a lack of resources, early EMIS work was incomplete and not sustained*
- *Later activity, with private sector implementation, gathered much data but developed little capacity*

- *More recently, development of standardised software augurs well for state-level EMIS to provide comprehensive information in support of decentralised management*

The initial development of EMIS started towards the end of the 1980s and consisted of three inter-connected phases. During the first phase, the requirement for information was driven by civil service reform and the need to ensure that decision-making was based on accurate and valid information. The second phase was driven more by donors and as a consequence experienced implementation difficulties due to lack of ownership and issues surrounding capacity. The most recent phase represents an attempt to overcome mistakes of the past and involve stakeholders at all levels of the process. This focuses resources on developing an EMIS at the state level, as well as support for the institutional structures necessary for coordination at the federal level.

The establishment of EMIS

Initial attempts at data collection in education were driven by the civil reforms of the 1980s. This involved the Government of Nigeria establishing Departments for Planning, Research and Statistics (DPRS) within public agencies. The rationale behind this policy was to develop structures that would help coordinate planning, research and development as well as data collection, storage, analysis and distribution. This resulted in the formation of the Education Data Bank (EDB) and the country's first education management information system (EMIS). Funding for the Education Data Bank project came from UNESCO and the objective was to strengthen the education statistical system to produce more relevant, reliable and timely data at all levels of the education system.

Moreover, in order to improve the government's understanding of education provision the Education Data Bank, in conjunction with support from UNESCO, undertook a series of school censuses. This took place over the 1988 to 1993 period and involved the successful implementation of three censuses. The data was entered onto spreadsheets and stored on a simple data base at the EDB. However, following the completion of the UNESCO project no donor funding was available to support the collation or analysis of data. The decision to undertake further data processing occurred three years later due to financial support from the World Bank. This illustrates a problem common in donor projects, namely lack of sustainability once project funding has ceased and also points to a lack of government commitment towards the census.

Subsequent developments of EMIS

The lack of coherent education data in Nigeria resulted in the Federal Ministry of Education, under the World Bank Primary Education Project, to conduct a series of school base-line surveys in 2001, 2002 and 2003. Numerous problems were experienced during the implementation of these surveys and they provide useful implementation lessons for other countries about to conduct a base-line survey, especially with regard to the role played by the private sector. The first significant issue relates to how project funds were disbursed. These funds were put out to private

tender and a consultancy company was awarded the contract for undertaking the survey. There is nothing wrong with contracting a private company to conduct this research, but the project resources were intended to develop capacity within the federal and state Ministries of Education as opposed to supporting the implementation of the survey by a private company. Second, some of the funds were provided to support the analysis of data at the state ministry, but this was not possible due to the fact that the private company withheld the data. Third, despite Microsoft Access being installed on government computers, government officials were unable to use the software because they received minimal training. Fourth, since all the survey data was stored on a series of different data bases and lacked consistent codes, it was not possible to compare or analyse this data. Fifth, owing to the centralised nature of the census data it was inconsistent with the data that was being collected at other levels of the education system (this issue is discussed extensively in other sections of the report).

As a consequence of the difficulties outlined above, the census data did not play an important role in the planning processes at either the federal, state or local government level. In response to these problems the World Bank decided funds would not longer be provided to support a centralised school census. Instead, the World Bank thought it would be more appropriate to fund EMIS developments at the state level. This also influenced the activities of the Federal Ministry of Education and the Universal Basic Education Commission, both of whom decided to support EMIS developments at the state level.

Under these changes the Federal Ministry of Education appointed the Education Development Bank to coordinate these reforms to EMIS, but the Universal Basic Education Commission EMIS took the initial steps to develop a National EMIS framework. These decisions represent the initial attempts to decentralise EMIS.

State level EMIS developments

The most recent developments for EMIS stem from the decision in 2004 of the Federal Ministry of Education, in conjunction with the Universal Basic Education Board, to support developments at the state level, but also continue institutional support at the central level. This strategy of decentralisation, called the “The National EMIS Framework”, consists of a number of initiatives. First, a decision has been taken to develop a single software system (NEMIS) for the whole of Nigeria in order to store and manage education data. Second, there was a movement towards state ownership of data. This will involve equipping states with the skills and equipment to manage EMIS in response to the process of decentralisation. Third, there has been an active involvement of all stakeholders and development partners in the construction of data collection instruments. Fourth, there will be a centralised depository for all EMIS data and attempts will be made to amalgamate previous census data. Fifth, attempts will be made to ensure that data on private schools are collected and stored onto the centralised EMIS. Sixth, adequate training will be provided to ensure that a culture of data utilisation occurs, especially with regard the use of EMIS reports to support the process of planning and monitoring. Seventh, there will be a gradual involvement of civil society and the media in reviewing EMIS reports and data.

Under this decentralised strategy it is anticipated that the education management system would become more demand driven and responsive to local needs, as well as assisting with issues associated with good governance. Moreover, the focus on the institutional development at the state level will involve the implementation of a school level census. This was initially piloted in six states and the plan is to extend this to a further nineteen states during 2006. Management training,² based on a model developed in Kano², is planned for 2006 in sixteen credit states³ with the objective of encouraging the use of EMIS reports.

The development of EMIS in the state of Kano provides an example of best practice. It shows the importance of obtaining immediate support for EMIS at the local level and the positive impact this can have on subsequent developments. Under this model EMIS was specifically designed to support state level planning and to generate reports based on enrolment levels, retention rates, facilities, qualified teachers, faculties and other information from the census form. This enabled the outputs from EMIS to have a direct impact upon the planning process, as well as producing reports that highlight anomalies in the education system such as enrolment declines, enrolment inflations or gender equity issues. The Kano state house of assembly was able to use EMIS generated reports to justify their 2005 education plan and obtain their annual budget from the Ministry of Education

5. Management and Operation of EMIS

- *Until recently, data collection issues have eroded stakeholder confidence*
- *Current developments are designed to improve data quality and utility although changes in school and cycle structure will pose significant data collection challenges*
- *Data on population and finance are limited in quality and quantity*

The development of EMIS had a direct impact on the process of data management. It also influenced the type and quality of data produced in Nigeria. The management of data collection can be divided into two distinct phases, pre-2004 and post-2004. In both phases problems were experienced in data collection and processing and, despite various reforms, the country still has a long way to go before EMIS is capable of supporting the policy making processes at all government levels.

The process of data collection pre 2004

Prior to 2004 there were several sources for data collection. A significant proportion of data collection was undertaken by the State Ministry of Education, the State Universal Basic Education Boards and the Federal Ministry of Education EDB. However, limited coordination occurred between the three structures and often this resulted in three different sets of education data being collected from the same state. The situation was compounded by the fact that numerous parastals were involved in data collection. As a consequence the type of schools covered by each of these

² Under USAID/RTI LEAP (2001 – 2004).

³ World Bank/DFID CUBE IDA Credit states

surveys varied enormously. In some instances there was a failure to include private or Q'uranic schools. There was also evidence to show that inflated enrolment figures were produced. This occurred because of the perception that education funding is heavily linked to enrolment levels. This resulted in a situation where certain data sets showed that fifteen states had a general enrolment ratio greater than 100% and in other data sets the figure was less than 70%. Understandably, this lack of consistency created a situation where stakeholders began to lose confidence in the outputs from the country's EMIS.

Until 2004 the collection of education data involved the implementation of a census form coordinated by the Federal Ministry of Education. This form was administered from the state level and the process often took several months due to the fact that many schools were remote and inaccessible. The primary schools forwarded the completed census forms to the local government education authority, who in turn submitted the same form to the State Universal Basic Education Board. At these levels officials would review the completed form in order to ensure completeness and validity of data. However, in reality this did not occur and instead the census forms were submitted to the Federal Ministry of Education and entered centrally. Moreover, no monitoring of schools occurred and no evidence existed to verify the activities of state level organisations in verifying data. This would suggest that state involvement in the whole process was minimal.

School Record Keeping and the Census Forms

From discussions with government officials, combined with visits to model schools, there was evidence to show that record keeping was ad-hoc and could not provide the type of information required by the census forms. At schools no information was recorded for the following variables: student repeaters, student deaths, student transfers and details about the teachers. Given this lack of information head teachers have two options when completing the census form, to leave the section blank or to provide inaccurate information. Moreover, a review by UNESCO found that schools did not have a standard form for record keeping and as a consequence no comparable data could be collected. The school inspectors who were appointed to support this process had little understanding about the importance of record keeping. There were also no incentives for the teachers to complete or forward the form.

According to reports produced by Federal Ministry of Education the failure of schools to provide accurate information affected the capacity of state ministries of education to achieve dispersal of recurrent and capital expenditures for many primary schools.

The process of data collection post 2004

In response to the various data collection problems prior to 2004 attempts were made to redesign the census forms taking into account the needs of stakeholders and the different tiers of government. Decisions were also taken to limit the amount of data stored by NEMIS to ensure that results were achieved with the amount of resources available. Attempts were also made to ensure that data was captured in order to monitor the indicators associated with the MDG/EFA, ESA and the UBE. As outlined this has involved the implementation of a school level census at the state level. The initial results from Kano demonstrated that this approach has proved successful,

especially with regard to the role played by EMIS in supporting strategic planning at the state level.

However, despite the positive impact of state level support level for EMIS the recent Universal Basic Education Act could have a negative impact on the way in which data is produced and any future strategy should take this into account. For instance, under this Act the existing structure of the country's education system will change from the existing 6 years of primary, 3 years of junior secondary and 3 years of senior secondary, to 9 years of compulsory basic education. Understandably, this reform will have serious implications for how education data is produced by schools in Nigeria. Indeed, some states are beginning to merge primary schools and junior schools, as well as splitting junior schools from their secondary schools. In other states new schools are being created in order to meet these new requirements. Other states have not yet started the reform process and still maintain the 6-3-3 structure. Any data collection techniques, including the proposed new census will have to address the changing structures of schools in each state. A strategy would need to be developed to ensure that the correct data is collected and that policy makers can make comparisons within, as well as across states.

Other sources of data

Financial data are notoriously difficult to capture in Nigeria. Several studies have attempted to estimate financial allocations at different levels of government and have encountered major difficulties in obtaining a clear picture of education financing. Beside basic financial data, such as school fees, the EMIS does not attempt to capture these data.

In some states, EMIS data are currently being used to calculate expenditure in areas such as staffing. This involves using EMIS data to project the number of teachers for a particular grade within a specific geographical area. However, most donor or government agencies are not willing to collect or publish financial information, especially about funds released or expenditure patterns. This situation is made worse by the funding mechanism used to disperse funds between the three tiers of government. In the light of these issues it is impossible to compare patterns of education expenditures between states or across the different levels. There have been moves to address the deficiencies in financial data and DFID, the World Bank and USAID are all planning financial studies in education throughout 2006. The results of these studies could pave the way for financial data to become more widely available for the education sector in the future.

Data on population growth are often used by governments as a means of estimating enrolment levels and participation rates for primary education. In Nigeria population data can be obtained from the National Population Bureau. However, the last survey was undertaken over 15 years ago. Nevertheless, in the absence of any other data this is still used (with an assumption that growth levels are around 2.8%. Another limitation of these data is that it is only possible to analyse trends at the state level but attempts will be made to overcome this limitation when the new census is implemented in 2006.

One of the other main data sources is the result of an education survey supported by USAID. This survey is conducted every five years and focuses on the quality and access aspects of education from the perspective of the child, family and school. However, due to the nature of coding used in their data bases it is only possible to use regional level data and not to compare them with other data stored in EMIS.

6. Technical strategy associated with EMIS

- *A new EMIS infrastructure, with web-based networks and appropriate software, is now well-developed and ready for adoption in an increasing number of states to improve information quality for stakeholders*

The development of IT networks and infrastructure surrounding EMIS in Nigeria can be viewed as an example of best practice and illustrate what approaches could be used by developing countries who are attempting technical reforms to their EMIS. A number of factors contribute towards the success of these reforms. First, a small scale pilot was undertaken in one state to iron out initial difficulties and ensure that a suitable strategy was adopted for implementation. Second, the strategy took into account the skill level of operators, the needs of stakeholders and the operating environment in which implementation took place.

Prior to the recent strategy to decentralise EMIS most states used simple spreadsheets in order to record basic data. Reviews have described state EMIS as having been “extremely undeveloped” consisting of spreadsheets containing basic survey data that has been collected annually. Reviews of this system also found that inadequate capacity existed within states to collate or analyse data at state level. Typically, Microsoft Office was used for documentation and spreadsheets. Software to analyse data such as SPSS or relational databases was not available and computer systems were compromised by viruses due to lack of protection systems.

In response to the perceived shortcomings, Kano State Universal Basic Education Board developed EMIS software using a relational database. This software is called the Kano Education Management Information System (KEMIS) and can be delivered over the internet or LAN from a single server. The census forms were also redesigned after interviews with key stakeholders. EMIS Reports based on the data derived from the census form were developed in response to the planning and operational needs of the State Universal Basic Education Board. Training was also provided for all levels of state government to enable them to use EMIS generated reports (for planning and evaluation purposes). The system developed a system of unique coding so that schools could be identified easily and tracked over time. The successful development of the Kano EMIS started to provide renewed confidence towards state-level EMIS development throughout Nigeria.

Software Development for EMIS

Following the success of the Kano EMIS, the Education Data Bank, with assistance from DFID/CUBE project, started to develop a National Education Management Information System for both federal and state levels. This involved redesigning the previous school census form and developing a new software tool for entering, managing and reporting on school census data. This new piece of software is called the Nigerian Education Management Information System (NEMIS). Software development on NEMIS commenced in Sept 2005 using local software developers. The system has been developed using the SQL server relational database, ASP.Net and Crystal Reports V11. NEMIS can be operated without the need to purchase software licences using the newly released SQL Server Express and can be delivered over a LAN, WAN or internet from a single server. Emphasis in architecture was given to ensure ease of system backup, restoration and transfer of data.

The NEMIS currently stores and manages 7 years of census data from 1999 to 2005, although the extent to which this data could be used to support the policy process is very questionable (see other sections). Over 50 reports generated from the EMIS are currently available in the system. These have been generated in response to the information needs of federal and state level government. The Education Development Bank currently manages EMIS data for the remaining twenty-eight states, but the implementation of the census in 2006 will activate a further eleven states.

All of the proposed activities will be supported by specifically designed management and technical support materials. Moreover, at the federal level, the Education Data Bank is going to establish a portal that will contain education data, publications, training materials and limited access to the NEMIS⁴. At the state level similar developments will occur at the State Ministry of Education and the State Universal Basic Education Board.

Justification for using a web based system

A needs analysis was undertaken in order to identify the most appropriate architecture for the EMIS, taking into account the skill level of operators, stakeholder needs and the operating environment. The decision was taken to use a web based server architecture for a number of reasons. First, web-based server architecture is more easily deployed than a client server system. This is because recent advances in web-deployed systems make them easy to deploy but a client server system relies on each client remaining stable which is rarely the case in open environments such as the EMIS laboratories in developing countries. Second, a web based system can optionally be deployed easily over a local or wide area network or the internet. Third, local area networks are easy and cheap to establish and maintain. An eight-port hub, network cables and network cards can be procured for under US\$400. Fourth, only one good computer, the server, is required. Understandably, it is easier to maintain such a system and virus protection is only needed for one computer (although strongly

⁴ Pending finalisation of a large federal IDA credit procurement.

advised for all computers). Fifth, a server-based system limits the amount of data management required since data goes onto the server.

The decision to develop a custom system locally was undertaken for three main reasons. First, good programmer/analysts are available in Nigeria and cheap to employ. Second, a non-proprietary, web based system could not be identified that matched the requirements of the school census in Nigeria. Third, a locally developed system could be altered as new needs became apparent and support for the system is readily available.

Availability of hardware

The existence of hardware systems on which to store and process information varies from state to state. For example, Jigawa, has hundreds of computers that can be moved to any department as required, but Niger state has only four computers that can be used in the State Ministry of Education PRS. During 2005 and the commencement of 2006 seventeen (World Bank IDA credit) states have equipped themselves with adequate computers including local area networks and VSAT⁵. The remaining (non-IDA credit) states are adequately equipped as result of different donor projects. Nevertheless, those states that have not benefited from development partner inputs remain poorly equipped. This indicates a lack of support for EMIS development in certain states. Adequate electricity is also a barrier to operation. Abundant generators exist in most states, although usage varies dramatically state to state since fuel is not always available. At the Federal level, the Universal Basic Education Commission EMIS has been adequately equipped. However, the Education Data Bank at the federal level currently lacks an adequate server or internet but procurement is underway to ensure that this happens by the end of April 2006. The Universal Basic Education Commission EMIS enjoys consistent power through provision of a generator, but power at the EDB is sporadic and often dependent on NEPA and the ad-hoc ministerial release of operating funds.

7. The sustainability of EMIS

- *Donors continue to fund most EMIS activity and challenges remain for hardware maintenance and energy supply in states lacking development partner inputs*
- *States are becoming aware of the benefits of EMIS but there remains some doubt about government's commitment to open accountability*

In the context of Nigeria EMIS sustainability is an issue that needs to carefully addressed, especially by the donor community who have provided a significant proportion of the resources for data collection and analysis. Indeed, the Federal Ministry of Education has undertaken national school censuses for the past eighteen years, but the majority of activities have been supported or financed by the international development community. This raises the question of whether the

⁵ “CUBE Hardware, Software and Training documents” for 17 IDA credit states reviewed and updated in Feb, 2005.

appropriate strategies for EMIS are being implemented in Nigeria. On a more cynical level it also raises the question of whether the Federal Ministry of Education is committed to the pursuit of credible data that can help support accountable and transparent systems of government. Nevertheless, the implementation of a state level EMIS at Kano demonstrates an example of best practice and one that could be followed by other states. However, a different type of donor support would be required in order to ensure that such an approach is sustainable, namely one in which technical assistance is provided for periods longer than five years.

Government Commitment of EMIS

Donors should not fund or support an initiative if the recipient government is not committed to the eventual ownership of the final product. The present research would question the degree of commitment from the Federal Ministry of Education. Evidence would suggest that the Federal Ministry of Education has not developed a sense of ownership or commitment for any aspect associated with EMIS developments. For instance, the Federal Ministry of Education was happy to support data collection activities over the 1994 to 1998 period, but when donor funding ceased so did the collation and analysis of census data. The FME only started data collection again when funding was available from the World Bank in 2002. The Federal Ministry has only funded the printing and distributing of the census. At present the 2006 school census is being prepared and most of the funds are expected to be provided by the development partners⁶ and not by the Federal Ministry of Education.

Despite the lack of federal support for EMIS there are some indications of sustainability, especially with regard to state level developments. State MoEs and SUBEBs have demonstrated commitment to EMIS through providing funds to support improvement in data collection and the various systems⁷. This supports the notion that an EMIS is more likely to be used if the products are brought closer to the producers of the data. There are direct benefits to operating effective EMIS at the state level and therefore states have an interest in producing education data that reflects their system. In Kano, for example, the State Ministry of Education has been able to request more funds along certain budget lines and has achieved a faster rate of disbursement as a result of EMIS. Nigeria has thirty-seven states and therefore central support is critical to maintaining state EMIS development and the most cost-effective solution. If a state EMIS ceases to function it can be easily reactivated by sending EDB staff for several days to the state. This is certainly less expensive and more sustainable than operating a separate EMIS development program in each state.

There is also a greater awareness in Nigeria about EMIS and the contribution it can make to the planning process, and for the first time education statistics are widely available. However, there is still no indication of whether this will transform to budget support for the census, especially in the light of the commitment and capacity of the Federal Ministry of Education.

⁶ USAID have committed to printing and distributing forms. 16 States have committed World Bank IDA credit loan money to monitoring and data entry at the state level.

⁷ Examples include Kano, Jigawa and Lagos. Of note is that all IDA credit states have used their own loan funds to procure equipment for and train staff in EMIS.

Sustaining a Decentralized EMIS in the Nigerian Context

Given the imperative of developing an EMIS at the state level, there is a need to address how this can be done without support from the Federal Ministry of Education. At present the only possible solution to ensure the development and utilization of an effective EMIS is through continued donor support until the capacity of the Federal Ministry of Education is improved. However, this raises another important question, namely the appropriateness of existing donor support. For instance, it is generally recognized that information systems take between three and five years to become institutionalized in efficient and accountable environments. In an operating environment such as Nigeria, which exhibits complex institutional structures, lack of accountability and an excess of waste, it would be assumed that institutionalization would take considerably longer. This indicates that sustaining long term support for EMIS becomes critical. Given that the average development project is between three and five years in duration and a large portion of time can be spent on establishing systems, it is perhaps understandable that development initiatives have not yet proved sustainable. This would suggest the need to ensure that development partners think about longer time horizons when planning and implementing projects or providing technical support.

Besides the actual process associated with the institutionalization of EMIS, it is also important to ensure that operational strategies are developed to ensure that outputs are utilized. Under the existing reforms attempts are being by made by EMIS at the state level to focus on the operational needs of end-users, such as inspectorate services and personnel management. It is hoped that this will help ensure sustainability by creating a dependency on EMIS and also ensure that the outputs are used by a broader range of stakeholders as opposed to those who are primarily concerned with high level planning.

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Annex I: List of people contacted during field work

Name	Position	Institution
Mr. Uguchukwu	Deputy Director	EDB
Mrs Gladys Macoju	DD	ESA
Mrs Amina Ibrahim	DD	EFA
Mr. Joseph Okafor	Chief Statistician	EDB
Mr. Nihi Dada	Systems Analyst	EDB
Dr. Jim Akers	Chief Education	UNICEF
Dr. Amiel Fagbulu	Former Director	FME Inspectorate
Professor Shuibu	Former Director	FME PRS
Mrs. Rosemary Nwangu	Chief Education	UNESCO
Mr. Doug Drew	Senior Education Advisor	UNESCO UIS
Mr. M. A. Madugu	State Ministry of Education	Director, PRS Niger state
Mr J.A Onifade State Ministry of Education	Director, PRS	Niger state
Engr. Augustine I. Odenigbo	State Ministry of Education	Director, PRS Enugu state
Maigari Danjuma	State Ministry of Education	Director, PRS Katsina state
Alhaji Mohammed Danyaro	State Ministry of Education	Director, PRS Jigawa state
Mr. Emman Olakunde	UBE	DD EMIS
Mr. Daisi Olakunde	Consultant	EMIS

Annex II: The Development of MDG indicators for Nigeria

Universal Basic Education (UBE) – Primary Education	Benchmark	Target Year	Target Amount	Source
% Children of official school going age (6-11) will be enrolled fulltime in primary school or equivalent education programme, including all school entry age girls.	85%	2006	100%	EMIS
% Children of primary school age (girls as well as boys) will be enrolled in primary school or its equivalent	85%	2015	100%	EMIS
% Improvement of completion rates to an overall rate exceeding 90% of those schools	-	2010	30% improvement	EMIS
% Increase in the number of children with disabilities mainstreamed into primary school	-	2015	50% increase	EMIS
% Transition rate from primary to junior secondary school		2015	90%	EMIS
% Children up to the age of 15 will be enrolled in school or an equivalent education programme	-	2015	80%	EMIS
% The percentage of working children of school age will be reduced and access to relevant basic education will be provided to those still working	-	2015	80% reduction	EMIS

Annex III: Universal Basic Education Indicators for Nigeria

Indicator	Source
Gross Enrolment Ratio	School Census
Net Enrolment Ratio	School Census
% of primary school teachers having the required qualification	School Census
% of primary school teachers who are certified to teach according to national standard	School Census
Pupil-teacher Ratio	School Census