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Strengthening the Education Management Information System (EMIS) in Tanzania: Government Actors' Perceptions about Enhancing Local Capacity for Information-based Policy Reforms

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**Strengthening the Education Management
Information System (EMIS) in Tanzania:
Government Actors' Perceptions about Enhancing
Local Capacity for Information-based Policy Reforms**

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**Master's Thesis
Concentration in International Education
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Abstract

Strengthening the Education Management Information System (EMIS) in Tanzania is an important task, as the government needs quality data and information to support the creation of sound policies, making plans and managing educational resources. Well-functioning EMIS can ensure achievement of national goals to provide quality education, which is the basis for facilitating economic growth and sustainable development. The government also needs quality data and information in order to enhance monitoring and evaluation of the education sectors' performance and ensure the right direction for achieving the intended goals and objectives.

Creating a sustainable and efficient EMIS is a challenge that requires great attention from both the government and development partners. This study finds that government decision-makers' perception of EMIS relevance is an important aspect of supporting its development initiatives and enhancing collaboration with external development partners. The study reveals that the government appreciates donors' support for EMIS development programs. However, this external technical and financial support should not replace the government's roles and responsibilities of enhancing EMIS capacity. Moreover, the study proposes that EMIS development initiatives that primarily focus on serving local demands are important motivations that can create the government's commitment and accountability to allocate adequate resources which are necessary for effective EMIS performance.

Likewise, this study recommends that the effective and efficient EMIS should be user-friendly and accessible to all stakeholders. A well performing EMIS should be able to produce authentic data and information that meets stakeholders' demands. It is the role of EMIS to influence

stakeholders' utilization of its outputs and promote an institutional culture which values information sharing and use of scientific evidence for educational planning, management and decision-making processes.

It is expected that policy makers and other stakeholders will use these findings and suggestions to improve EMIS development strategies and enhance stakeholders' partnership in matters pertaining to strengthening EMIS functions, particularly in low-resource contexts.

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Introduction

Achieving national and international educational goals depends upon the use of an efficient Education Management Information System (EMIS), which provides educational data and information for the purpose of measuring and guiding the performance of education systems. EMIS is a necessary tool for providing quality data and statistics enabling formulation of sound policies and decisions, creating evidence based plans for improvement, and conducting sector monitoring and evaluation.

The Tanzania Ministry of Education and Culture (2004), Bodo (2006) and Powel (2000) describe the Education Management Information System (EMIS) as an institutionalized framework with a primary role to collect, process, analyze, disseminate and manage educational data and information necessary for educational management functions. The effective and efficient EMIS is expected to produce high-quality, relevant and accessible data for all users. The Southern African Development Community (SADC), in its EMIS Norms and Standards guidelines (2009), describes eight dimensions of quality statistics; relevance, accuracy, timeliness, accessibility, interpretability, coherence, methodological soundness and integrity. EMIS units are often established within the Ministries of Education or departments accountable for education.

The existence of a well-functioning EMIS at all levels of education management and delivery enhances capacity to monitor and evaluate performance of education systems and provides comparative mechanisms to assess degrees of achievement across the subsectors at national and international levels. The Association for the Development of Education in Africa (ADEA) (2009), quoting the South African Minister of Finance, emphasises that:

Whether we wish to...pursue macroeconomic convergence in the region, or assess progress in achieving the Millennium Development Goals, accurate, timely, useful data lie at the heart of all these efforts... Achieving the right policies requires the management of trade-offs informed by good statistics (p.12).

Educational decision makers appreciate quality data and information if they have confidence that it leads to evidence-based decisions that ensure delivery of quality services, because they believe that quality services eventually promote the goal of improving national wellbeing (Messec, 1990). The efficient and effective EMIS gains more importance when decision makers at different levels demonstrate their trust in the system by demanding quality data. The increased demand for quality data among decision makers also encourages the government to allocate sufficient resources for managing EMIS functions to produce and disseminate data and statistics required by users. The governments' willingness to continually support functions of EMIS then reinforces evidence-based decision making, planning, and monitoring of education performance, which hopefully lead to achievement of educational objectives at all levels.

Tanzania, like other developing countries, has invested resources in its EMIS so that it can produce data and information that support educational management and development. Through monitoring and evaluation of sector performance, the government can efficiently manage its educational system by enabling information-based policy reforms and making effective strategic plans. With efficient collection, processing, analysis, dissemination and management of data and information, the delivery of education services can improve.

Unfortunately, government's limited capacity to support EMIS development and the increase in dependency on external financing and technical assistance threatens ownership and sustainability

of the system. The small amount of financial and technical resources allocated to EMIS limit its efficiency, resulting in lower-quality data and statistics, leaving policymakers unable to base educational policy reforms and management decisions on an accurate picture of the system's strengths and weaknesses.

This situation may be due to several factors, including low demand for EMIS outputs from decision makers, policy makers, and planners. Low demand may be due to the user-unfriendliness of the system itself or the perceived irrelevance of the EMIS outputs to users, since resource constraints make it difficult to implement policy choices in any case. Less demand for good data demotivates the government to strengthen EMIS functions and further reduces the allocation of resources for EMIS development.

Thus, the relationship between policymakers and data appears to exist in a vicious cycle: policymakers don't use (or see the use of) the data or do not see the need for investing in their own system for producing it; therefore, they give it less emphasis, leaving external donors to support it, further weakening its functionality and further convincing policymakers of its irrelevance. Therefore, we need information on policymakers' perception of the value of the EMIS to their work, so that we can understand how to break this cycle and strengthen EMIS capacity and the data it produces. Specifically, the study intends to explore decision makers' views on increased external support for EMIS development, thus revealing factors that act as barriers to EMIS development and its performance. The goal of this study is to understand, from the point of view of educational policymakers and stakeholders, the barriers to developing and using an efficient EMIS system, and to use these findings to propose ways of mitigating those

factors that stall EMIS progress and function as a foundation for good educational decision making.

The Education Management System in Tanzania

Description

The education management structure in Tanzania comprises central departments, Regional and Districts offices, Ward offices and schools/institutions. Central departments are located at the Ministry of Education head office, and their main roles are overall management of education such as developing the national policy frameworks, setting norms and standards, and coordinating monitoring and evaluation of the sector progress and performance.

Central departments are divided in two categories. One category includes seven departments directly concerned with educational delivery in schools/institutions: (1) Primary Education, (2) Secondary Education, (3) Teacher Education, (4) School Inspectorate, (5) Technical and Vocational Education, (6) Higher Education and (7) Adult and Non-formal Education. These departments operate under the Commissioner for Education.

The second category includes Policy and Planning, and the Administration and Human Resource Management departments. These are cross-cutting departments that serve the whole sector. The Minister, a political representative, leads the Ministry. The Permanent Secretary manages all professional and technical matters, and is the chief accounting officer for the Ministry (See Annex 1).

Regional Education offices act as coordinating centers that link Districts and the Ministry. District education offices are operational levels for policies implementations. In the existing semi-decentralized system, districts are accountable to two ministries: (1) the Ministry of Education for education management matters and (2) the Ministry of Regional Administration and Local Government for public primary and secondary schools management logistics. Ward educational offices are coordinating centers that connect schools and districts.

Currently, there are 25 regions and 133 districts. The total number of both public and private schools and institutions include¹:

- 15,816 primary schools, with enrollments of 8,419,305
- 4,266 secondary schools, with enrollments of 1,638,699
- 92 teacher training colleges, with enrollments of 25,814
- *215 technical institutions, with enrollments of 102,217 and
- 31 universities, with enrollments of 118,951.

Structure

In Tanzania, the EMIS unit is located in the Policy and Planning Department at the Ministry of Education and Vocational Training head office. The EMIS unit is responsible for production, dissemination and management of data for the entire sector. The central databases are developed according to the four main sub sectors: (1) Basic Education, which comprises pre-primary,

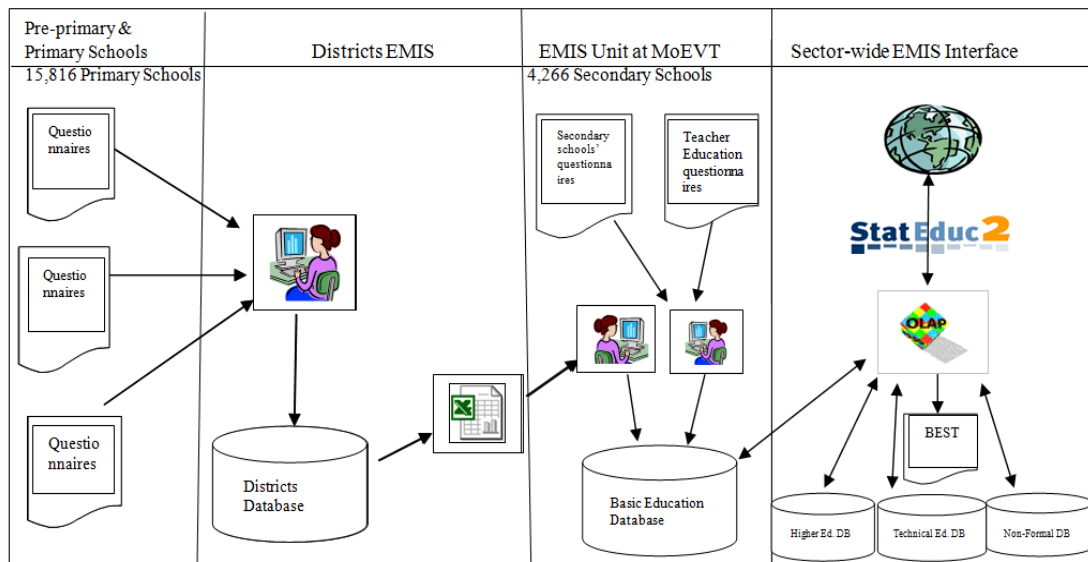
¹ Basic Education Statistics in Tanzania (BEST) 2006-2010 National Data, 2010; *BEST National Data, 2011.

primary and secondary education, (2) Technical and Vocational Education, (3) Adult and Non-formal Education, and (4) Higher Education.

The EMIS unit collects data annually through the schools/institutions census. They use specific questionnaires for each level of education in the sub sector. The time frame for data collection and publication is about six months. Schools/ institutions are required to complete questionnaires by 1st March every year. Pre-primary and primary schools submit their questionnaires to the district education offices in mid-March. Then districts consolidate them and send to the EMIS unit in April. Secondary schools and teacher training colleges return their questionnaires directly to the EMIS unit. For other sub sectors, data is processed through their respective databases and then integrated into the central EMIS database.

The EMIS unit processes, analyzes, and publishes the data from April to June. The Ministry publishes the annual data in two statistical booklets. The first is *Basic Education Statistics in Tanzania (BEST): National Data*. This booklet provides data at the national level. The second booklet is titled *Basic Education Statistics in Tanzania (BEST): Regional Data*. This publication provides data at the regional level. Currently, statistics tables published in the BEST can be accessed online through the ministry's website. Figure 1 below shows the EMIS operational system in Tanzania.

Figure 1: EMIS Operational System in Tanzania



Source: EMIS Research Study, 2012.

Background

Historically, initiatives for EMIS development in Tanzania can be traced from 1960s after national independence when the government established the statistics unit at the Ministry of Education. The statistics unit worked manually and most of the data produced was quantitative. In the 1980s the ministry started to publish its annual national statistics abstracts, written in English and presented in tables without narrative analysis.

In the 1990s, the statistics unit improved its functions by using computer applications for data processing. They created a database and used COBOL as the programming system, which helped to consolidate data collected in schools or aggregated at district level and create summary tables for production of BEST. The task, which was partly done manually, was tedious. The system was unable to keep historical data; therefore it repeated the same steps sequentially for every data cycle. Basically, the statistics unit collects data through annual school censuses. Special

questionnaires are sent to each school every year. Primary school data are aggregated at the District level and then sent to the Ministry. Secondary school questionnaires are returned directly to the Ministry, and data entry is done for each individual school. In 2000 and 2001, the World Bank supported the statistics unit functions at the national level by providing more computers and introducing scanning technology for data entry and processing.

Responding to the Millennium Development Goals (MDGs) and Education For All (EFA) policy reforms, the government transformed the statistics unit to the EMIS section aiming at building more capacity in producing data and information which can answer policy questions related to the MDGs and EFA objectives. The Education Sector Development Program (ESDP) (2001) recognizes EMIS as one of key priority areas which should be strengthened to achieve EFA objectives. The government incorporated EMIS implementation strategies in the Education Sector Development Program. The ESDP implementation was officially started in 2002 by launching the Primary Education Development Program (PEDP) 2002-2006. Although the EMIS section was equipped with new computers and connected to the internet, the basic process of data collection and information production was not changed. EMIS continued to use COBOL and publish tables of quantitative data in the BEST.

During the first PEDP review in 2003, the government and development partners were not satisfied with EMIS performance. EMIS was not able to provide sufficient data and information required to monitor and evaluate PEDP achievement according to MDGs and EFA indicators. Therefore, in 2003, the Japan International Cooperation Agency (JICA) conducted an EMIS needs assessment and noted problems in data production such as data redundancy, misreporting,

misinterpretation of some technical terms, and ambiguous terminologies and instructions. The JICA study resulted in preparation of EMIS Development Plan (2004 – 2007) in 2004, which focused on installing a new user-friendly database and improving capacity in data production, dissemination and utilization. In 2005, the Ministry started to upload BEST tables on its website.

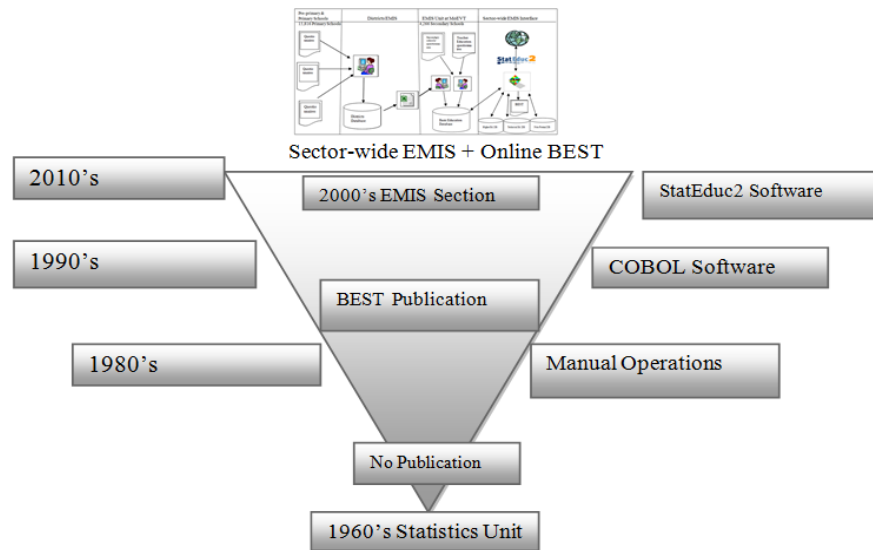
Simultaneous to the JICA initiatives, UNESCO Institute for Statistics (UIS) conducted another EMIS diagnostic survey (UNESCO, 2004) that provided a detailed status of EMIS. The survey was done as a response to the government request for technical support to strengthen EMIS. UIS identified shortfalls such as data inconsistency, inaccuracy, poor infrastructures, low capacity of EMIS staff, and low institutional and financial support. Generally, the survey revealed production of low-quality data. The survey also documented the limited use of collected data for sector plans and budgets. Instead, decision making and sector plans were prepared based on assumptions and estimations from general knowledge and experiences of individuals or enforced by political pressure.

In the Joint Education Sector Reviews (JESR) of 2006 and 2007, normally done by the government, Development Partners (DPs), Non-Government Organizations (NGOs), Community Based Organizations (CBOs), and Civil Society Organizations (CSOs), stakeholders emphasized the need to develop a consistent sector-wide monitoring and budgeting system which could strengthen and incorporate sub-sector planning processes. Stakeholders demanded the creation of a harmonized information system with the capacity to generate data required for planning and budgeting purposes. The government was also required to strengthen analysis in sector performance reporting of results against plans and resources allocated (UNESCO, 2008).

Therefore, in January 2008, UNESCO, in collaboration with the Tanzanian government, launched implementation of the Education Sector Management Information System (ESMIS) program. The main funders were the European Commission (EC), UNICEF, UNFPA and WFP. This three-year project (2008-2010) was expected to strengthen EMIS by harmonizing sub-sectors' Management Information Systems (MIS) and building a strong monitoring and evaluation system for the ESDP. The education sub-sectors include Basic Education which comprises pre-primary, primary and secondary education—Technical Education, Vocational and Non formal Education and Higher Education.

ESMIS tasks included strengthening the existing Education Management Information System (EMIS), decentralizing the Basic Education Management Information System to the District level, and developing a new Management Information System (MIS) for Vocational and Non formal Education, Technical Education and Higher Education. Then, ESMIS was required to harmonize all MIS in a single sector-wide EMIS and make it accessible online through a sector-wide communication space. Moreover, ESMIS was required to provide training for maintaining and managing the sub-sector MIS and building capacity in utilizing data generated by EMIS and other sources for the purpose of strengthening sector-wide planning and policy reform. The ESMIS project installed new databases with software to all sub-sectors, provided computers and other accessories, and uploaded the sector database and BEST online through the Ministry's website. The project was completed in December 2010 (UNESCO, 2010). Figure 2 below shows the EMIS development stages in Tanzania.

Figure 2: EMIS Development Initiatives in Tanzania



Source: EMIS Research Study, 2012.

Problem Statement

The interventions in EMIS development in Tanzania could have brought more efficiency and increased quality of data and its utilization. However, EMIS continued to produce data and statistics prone to errors and limited access. Data inconsistency and inaccuracy is easily recognized in national statistical publications. For example, figures in enrollment, drop outs, repeaters and teachers rise and fall unsystematically, while some indicators, like enrollment ratios, show disparity with data from population census and national projections. Table 1 below gives evidence of data inconsistency published in the national education statistics abstract, 2008 and 2010.

Table 1: Cohort Enrollment, Dropout and Repeaters in Secondary Education, 2004-2009

Year	Class	Enrollment			Total Dropout	Total Repeaters
		Male	Female	Total		
2004	Form 1	77,475	73,015	150,490		
2005	Form 2	78,905	76,814	155,719	(Form1-2) 3,010	(Form1-2)1,246
2006	Form 3	60,848	54,199	115,047	(Form 2-3) 31,767	(Form 2-3) 691
2007	Form 4	57,553	48,989	106,542	(Form 3-4) 4,487	(Form 3-4)1,492
2008	Form 5	21,949	15,867	37,816	(Form 5-6) 38	(Repetition rate 1.6)
2009	Form 6	13,245	8,546	21,791		

Source: Basic Education Statistics in Tanzania, 2008 & 2010.

Technically, without repeaters and dropouts, we expect the number of students enrolled in the current year to be the same as in the previous year. If the number of repeaters is high, then enrollment in the next grade will increase. If the number of dropouts is high, then enrollment in the next grade will decrease. However, figures in the table above show increase in total enrollment in the next grade while there is small number of repeaters and dropouts. For example, the form 2 total enrollment in 2005 is higher than the form 1 total enrollment in 2004.

In addition to discrepancies in the data, the human capacity for EMIS section continued to decline over time. It should be expected that the number and capacity of EMIS staff might correspond to the increased workload and data demands resulting from dramatic expansion of schools/institutions and enrollment. Unfortunately, the attrition rate of EMIS staff with basic professional qualifications and work experience in education data and statistics continued to increase while the replacement rate is low, resulting in an acute shortage of staff and increased workload. SADC (2009) insists that EMIS should be provided with adequate resources such as statistical programs, personnel, facilities, equipment, technology, training and finance. SADC

(2009) proposed that the EMIS staff composition at the national level should include qualified graduates who are able to work as EMIS managers, statisticians, survey administrators, programmers, hardware and software maintenance experts, and data capturers. However, the EMIS staff in Tanzania has a shortage of the qualified and experienced persons in the categories proposed by the SADC. The current EMIS staff has only statisticians, economists and educationists (teachers). Table 2 below shows that, in 2004, the number of EMIS staff who had different qualifications relevant to the EMIS functions was 12 but in 2010 the number decreased to 6.

Table 2: Number of EMIS staff with basic professional qualifications, by years of experience (2004, 2008 and 2010)

Professional Qualifications			
	Year		
	2004	2008	2010
Statistician	3	3	3
Demographer	1	1	
Economist		1	1
Computer specialist	1	1	
Teacher	5	4	2
Other	1	1	
Total	11	11	6
Staff Experience in Education statistics			
<2 years	1	2	1
2-5 years	5	1	1
5-10 years	1		2
10-15 years		5	
15-20 years	3	1	1
>20 years	1	2	1
Total	11	11	6

Source: Adapted from UNESCO Diagnostic Report, 2004, p.20; EMIS Research Study, 2012

At the same time, unfortunately, Table 3 below shows the rate of increase in the number of schools and enrollments with consequent increases in EMIS workload and demands for quality data.

Table 3: Number of Institutions and Enrollments in Tanzania (2005-2010)

Year	Institution					
	Primary		Secondary		Teacher Training Colleges	
	No. of Institutions	Enrollment	No. of Institutions	Enrollment	No. of Institutions	Enrollment
2005	14,257	7,541,208	1,745	524,325	52	24,015
%Increase	4.1	5.6	31.2	28.9	1.9	15.5
2006	14,700	7,959,884	2,289	675,672	53	27,736
%Increase	5.1	4.5	52.2	51.0	3.8	-29.2
2007	15,446	8,316,925	3,485	1,020,510	55	19,640
%Increase	1.5	1.1	9.0	19.8	1.8	-17.6
2008	15,673	8,410,094	3,798	1,222,403	66	16,700
%Increase	0.3	0.4	8.0	16.6	16.7	30.1
2009	15,725	8,441,553	4,102	1,466,402	77	21,723
%Increase	0.6	-0.3	3.8	11.7	16.0	19.0
2010	15,816	8,419,305	4,266	1,638,699	92	25,814

Source: BEST, 2005, 2010; EMIS Research study, 2012.

Moreover, the Ministry of Education and Vocational Training (MoEVT) has continued to produce the two publications (*BEST National* and *BEST Regional Data*) with slight additions of tables without detailed analysis. Lack of user-friendly publications presents challenges for the use of statistics in Ministries of Education:

The quality of the disseminated material is often lacking, with cumbersome abstracts designed for reference frequently being the only published outputs, despite some attempts to develop skills in preparing more targeted and easily understood offerings (ADEA, 2009, p17).

Most of the published data in BEST is quantitative with national and regional aggregates. The language used for publication is still English, which is understood by only a few literate stakeholders. The use of English as the only language for the BEST publication contradicts the government policy of using Kiswahili as the official language within the country. BEST is a

government document that must be accessible to all citizens and other stakeholders.

Nevertheless, the Ministry's financial support for EMIS has remained low over time. The government's recurrent budget for EMIS, which normally ensures sustainability of activities, is still low with insignificant increases regardless of the dramatic increases in the number of schools/institutions and enrollments. For instance, according to the BEST: National Data; (2005 and 2010), the number of schools and enrollments from 2005 to 2010 was dramatically increased. For secondary education, in particular, the number of schools and enrollment was tripled. It is obvious that the situation required more allocation of resources for EMIS.

More evidence about how underfunded EMIS is can be found in the financing trends of the Ministry. For example, in the consecutive five years from 2005/06 to 2009/10, the EMIS budget was static, compared to the gradual increase of the Ministry's total budget. Table 4 below shows the EMIS budget does not correlate with expansion of the education systems and the expected outputs.

Table 4: MoEVT Budget for EMIS (2005/06 to 2008/10)

Year	EMIS Budget in TZS*	Exchange Rate in USD*	EMIS Budget in USD	MoEVT Budget in TZS	MoEVT Budget in USD in USD	EMIS Budget as % of Total MoEVT Budget	% Increase of MoEVT Budget	% Increase of EMIS Budget
2005/06	37,300,000.00	1,267.00	29,439.62	17,543,500,000.00	13,846,487.77	0.21		
2006/07	81,609,000.00	1,279.00	63,806.88	23,965,100,000.00	18,737,372.95	0.34	35.32	0.25
2007/08	77,549,000.00	1,188.00	65,276.94	26,568,000,000.00	22,363,636.36	0.29	19.35	0.01
2008/09	137,100,000.00	1,314.00	104,337.90	52,747,600,000.00	40,142,770.17	0.26	79.50	0.17
2009/10	264,526,000.00	1,394.00	189,760.40	50,749,300,000.00	36,405,523.67	0.52	-9.31	0.21

*TZS: Tanzania Shillings; USD: U.S. Dollars

Source: MoEVT: Medium Term Expenditure Framework; 2005/06 – 2008/10; Bank of Tanzania Website; BEST, 2010; EMIS Research Study, 2012.

There is no doubt that lack of adequate government support for EMIS development:

....significant problems were experienced with the operation of EMIS at all levels of the education system, and in the vast majority of instances systems were unsustainable without a considerable amount of donor support. Similarly, the utilization and dissemination of EMIS outputs were lower than anticipated (Powel, 2006, p.7).

Is it possible that there is a relationship between increased external donors' funding of EMIS and reduced capacity of EMIS to perform its functions efficiently? Could the external (international) support the Ministry receives for EMIs contribute to stalled development of EMIS?

This situation raises some questions about the importance the Tanzania government places on using the EMIS to inform educational management functions, including policy formulation, planning, and monitoring and evaluation of the education sector performance. Tanzania, like many developing countries, has centralized administration and management bureaucracies, and most of decisions are made at high levels. One might hypothesize that effective and progressive change for EMIS would largely depends on the decision makers' commitment (Powel, 2006) and attitude at the central levels, and such commitment might be influenced by the level of support already provided by external donors. Thus, we need information about the reasons that lead governments and individuals actors to marginalize EMIS functions so we can suggest ways of improving EMIS performance.

Therefore, this study attempts to explore perceptions of decision makers about EMIS. Do they recognize and value EMIS as a tool that enhance decision making and policy reforms? Is the government willing to prioritize EMIS investment and utilization on its own or is it relying on

the external pressure that influences participation in global data and information sharing? (Wicander, 2011). Is EMIS relevant to users within Tanzania, especially to the education management officials? This study intends to provide a previously unavailable analysis of the attitudes held by administrators about the EMIS. The study findings will inform the government, development partners and other stakeholders about other ways of supporting EMIS to make it more efficient and sustainable.

Purpose of the study

The purpose of this study is to examine Tanzanian decision makers' perception about EMIS in order to understand factors affecting the current implementation of EMIS. Based on these findings, the study will propose ways of eliminating bottlenecks and increasing decision makers' commitments to EMIS, such as allocating sufficient resources for EMIS development and use. Moreover, the study intends to provide options for strengthening partnerships between government and development agencies that would ensure sustainable development for EMIS.

Significance of the study

As the country strives to achieve national and international goals of education, it needs to constantly monitor and evaluate sector performance in order to set appropriate policies and plans at all levels. Decisions and strategic plans should be scientifically prepared using accurate, valid and reliable data and information. Therefore, this study will provide greater understanding about

the perceived challenges in the minds of decision makers, policy makers, planners, managers and all stakeholders to the creation of a well-functioning EMIS that would produce accurate, timely, valid, and reliable data for improving the quality of education in Tanzania.

Limitations

The study used qualitative methodology in which its findings were based on observations and the reported information from selected research participants. The study involved senior management officials at the Ministry and District levels that might introduce bias in the findings. Moreover, the research study is limited to the policy perspectives and does not provide objective detailed technical aspects concerning information technologies and related statistical computations.

Research Questions

This study attempts to answer the following questions:

1. What are the perceptions of decision makers at national and sub-national levels about EMIS?
2. How does EMIS influence decision makers at national and sub-national levels in utilizing data and information for evidence-based planning, and monitoring and evaluation of the education sector performance?
3. What do decision makers think about external donor funding of EMIS development?

The Conceptual Framework

The conceptual framework focuses on the Perception-Based model for EMIS development, modified from the Perception-Based model for Technological Innovation in Small and Medium Enterprises (SME) (Felix, 2010). The main attributes for the model include the perceived impact of EMIS, perceived organizational readiness, and perceived external support.

Perceived impact of EMIS

The impact attribute of the framework covers four domains:

1. **quality of the system:** stakeholders' perceptions about how well EMIS performs relative to its design and technical perspectives
2. **data and information quality:** perceptions of the EMIS products
3. **users' impact:** perception about the influence of EMIS on their own performance
4. **organizational impact:** perception about the influence of EMIS on organizational performance.

Perceived organizational readiness

The organizational readiness attribute of the framework is concerned with institutional arrangement and how EMIS is valued and supported within the government, administration and management systems that ensure its existence. This attribute has three domains:

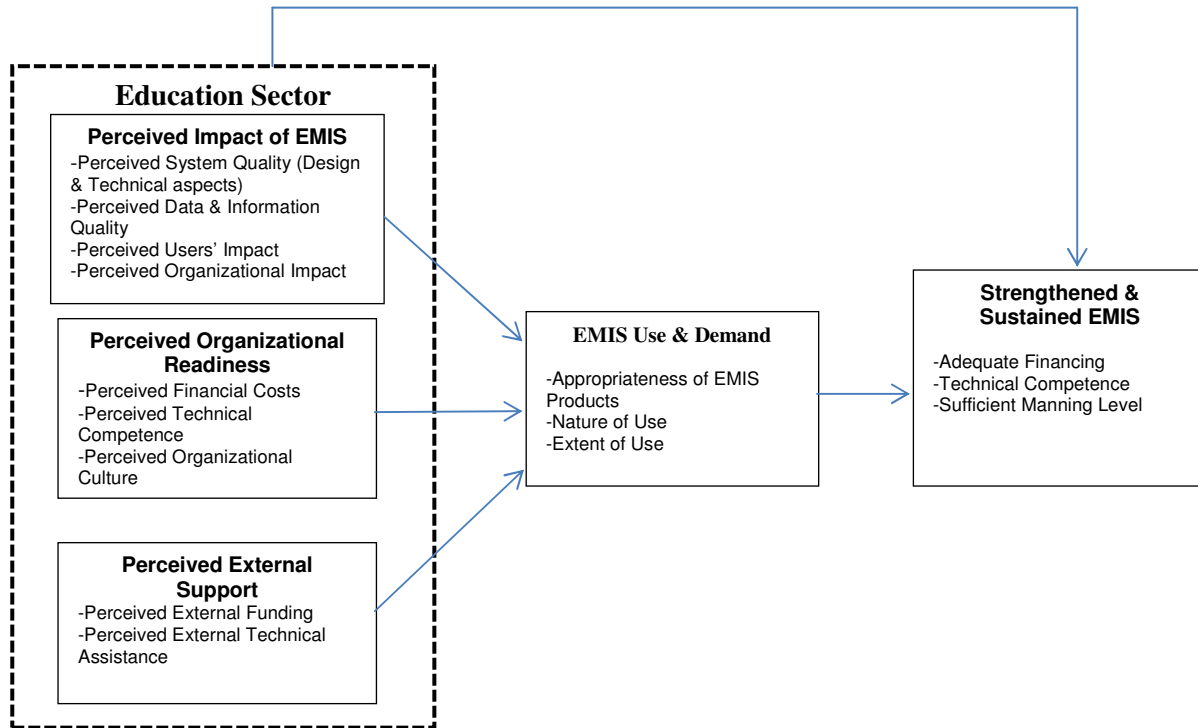
1. **financial cost:** stakeholders' knowledge about the amount of financial resources required to manage EMIS, since the government should have the commitment to allocate sufficient resources to facilitate and enhance EMIS functions
2. **technical competence:** perception of the readiness of the organization's members to adopt technologies that could enable them to utilize EMIS; in other words, the skills required of internal staff so that they can manage EMIS functions
3. **organizational culture:** perception of whether there is resistance among organization members, particularly at the management levels, to accept and utilize EMIS.

Perceived external support

The external support attribute of the framework focuses on the external influences on EMIS development. Major domains of this attribute include perceptions about external funding and about external technical support. The attribute captures how external intervention influences government potential to operate, manage and utilize EMIS.

The three attributes—perceived impact of EMIS, perceived organizational readiness, and perceived external support—determine the usefulness of EMIS and generates users' demand. When EMIS products are appropriate, useful and accessible to its users, management is more motivated to provide adequate financial support, build required technical competence, and deploy sufficient staffing level. The government's commitment to and accountability for EMIS are necessary aspects for strengthening EMIS and ensuring its sustainability. Figure 3 below summarizes the perception-based model for EMIS development.

Figure 3: A Perception-Based Model for EMIS Development



Source: Adapted from Felix, (2010) p. 6. A Perception-Based model for Technological Innovation in SMEs

Review of Related Literature

Quality data is an important aspect of using information for educational management functions in education systems (Hua & Herstein, 2003). By using quality data, decision makers are able to make good policy choices that enhance the efficiency and effectiveness of the education system performance. Access to quality data and its utilization facilitate proper allocation of resources to achieve prioritized objectives and gauge expected outcomes. It is a challenging task for the government and decision makers to understand whether the invested resources in education have created impact that brings out transformative changes to human capital formation (Powel, 2006). They need mechanisms that provide analytical information describing how educational inputs are transformed into educational outputs:

Policy makers are under pressure to respond to new policy demands and it is important that they have the appropriate information to make informed decisions. EMIS must respond to such demands and those working in this area must understand how this impacts on the demands for information... (Powel, 2006, p.7).

A well-developed and functioning EMIS is a useful tool to inform government decision makers and other stakeholders how the educational system performs.

EMIS Development and Local Demands

Ideally, EMIS development is related to decision makers' demands for information as a result of policy reforms and policy questions. For example, in 1982, the Ohio Department of Education in the United States of America increased its investment in EMIS improvement project after the General Assembly demanded an efficient information system that could provide quantitative and

qualitative data for analysing educational progress and achievements. In that year, the budget for EMIS activities doubled from USD.79 million to USD.144 million (Legislative Office of Education Oversight, 1998). The higher the demand for good information, the more likely the EMIS will be effective, efficient and sustainable.

Nepal initiated a similar effort in the 1990s when decision makers at the Ministry of Education requested external support to rebuild the EMIS in order to provide monitoring and evaluation data and information about the implementation of the primary education reforms (Shrestha, 1990). Nigeria provides another model for EMIS strengthening initiatives that emerged from decision makers' demands for quality data. Following the civil reforms in the end of 1980s, decision makers in Nigeria realized the need for an efficient EMIS to provide accurate data and valid information that might enhance information and evidence-based decision making (*infoDev*, 2006). External donors helped fund this EMIS development project.

The Education for All and Millennium Development Goal initiatives were introduced when most developing countries faced resource constraints for educational expansion (Adam, et al 2011; Powel, 2006). Therefore, EFA and MDG funding came mainly from external donors (Powel, 2006). The promotion of EFA and MDG resulted in sudden and dramatic expansion of school enrolments. As a result, stakeholders needed immediate mechanisms to track the progress of the system in dealing with such expanded access.

External donors required governments to measure progress and achievement of EFA goals and objectives (Adam, et al 2011) by monitoring and evaluating educational quality standards.

UNESCO (2010) classifies these standards into three domains:

1. **quality of inputs to education**, which included teachers, curricula and teaching/learning materials, school environment and physical facilities, and financial resources;
2. **quality of process**, such as teaching and learning methodologies, teacher/pupil interactions, management and community support; and
3. **quality of outputs and outcomes**, including completion rate of a level, specific acquired knowledge, skills, values and behavior, ability to access or create jobs, participation and contribution to the society and local community and continuity in terms of learning, doing, being and living together (UNESCO, 2010).

However, it is not possible to measure any of these without accurate, reliable, valid and timely data and information. Therefore, donors and governments decided to develop and strengthen EMIS to provide evidence that could assist in review of policies and strategies. However, donors enforced such EMIS development initiatives, especially in African countries. Adam, et al (2011) identifies the major international institutions largely involved in providing technical and financial support. These included the United Nations Scientific and Cultural Organization (UNESCO), the European Union (EU), the Department for International Development (DFID), the Swedish Agency for International Development (SIDA), German technical cooperation (GTZ), the French Cooperation, the United Nations Children's Fund (UNICEF), the World Bank and the United States Agency for International Development (USAID). EMIS capacity building

across the region was facilitated by the Association for Education Development in Africa (ADEA).

Often donor agencies had more legitimacy for EMIS development projects. They planned and designed kinds of systems they would like to develop. For instance UNESCO can decide on technological matters such as installation of hardware and software, upgrading the existing system creating new databases and building capacity in database management and utilization of data and information and other activities related to the project. The ESMIS project in Tanzania provides a good example of the externally imposed initiatives whereby all technological know-how relied on UNESCO (EMIS Research Study, 2012). Donors needed to find ways of standardizing the EMIS so that they might easily conduct comparative performance among educational systems. Unfortunately local experts find themselves misplaced as they not able to adopt quickly and manage new technologies.

Apparently, increased external technical and financial support for EMIS development programs particularly in the low-resource contexts have been criticized for reducing local capacity and increasing dependency on donors, which threatens sustainability of the established or strengthened EMIS. While citing examples of EMIS development projects in four developing countries; Bangladesh, Nigeria, Ghana and Mozambique, Powel (2006), argues that it is easier for EMIS development project supported by donors to collapse once the aids stops. In these contexts, it is possible to give EMIS functions low priority due to lack of local ownership exaggerated by limited resource, lack of institutional and low technical skills for EMIS staff. In

addition, governments may not prioritize EMIS development when the government has a history of basing decisions on individual interests or political pressure.

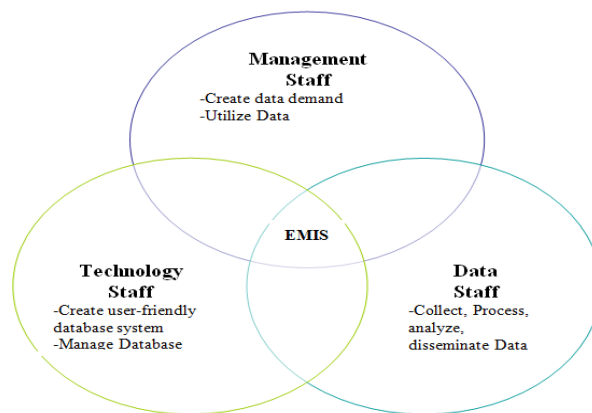
Apart from external support, EMIS brings more meaning and becomes more useful if its outputs might effectively utilized by the government and related institutions to manage the whole educational systems. Several scholars such as Hua & Herstein (2003), Powel (2006), and Messec (1990), describe the absence of a “culture of data demand and information sharing” in education management systems as one of the hindering factors for EMIS development, particularly in developing countries. Information monopoly among educational management hierarchies is regarded as authority for command and control. Decision makers especially in bureaucratic and centralized management and administrative systems feel secure and more confident when they are able to limit sources of and access to information by creating levels of accountability within their jurisdictions. They may perceive EMIS as a tool that weakens their supremacies; therefore they give low priority to its development.

Regardless of the shortfalls identified in the implemented EMIS development projects, importance of quality data and information is crucial within educational systems. Among the EMIS development challenges include how to promote local demand by creating ownership, make EMIS more user-friendly, accessible, compatible with the existing technology, easy to update, and with reasonable costs. Messec (1990), remarks that “decisions will and must be made - with or without data-based information” (p.4). Therefore, EMIS should encourage decision makers to be active users of the tool instead of being “passive recipients” of its outputs

(Powel, 2006), thereby possibly motivating managers to increase resources for EMIS functions and sustainability (p.10).

Enabling active use of EMIS will require the system which actively engages all key players in the entire process of data production, management and utilization. An effective and efficient EMIS should ensure that it creates an interactive network that enhances collaboration between management staff, technological staff and data staff so that they all feel accountable and comfortable to provide inputs and access the outputs. Figure 5 below shows roles of management staff, technology staff and data staff in interactive EMIS network.

Figure 4: Interactive EMIS Model



Source: Modified from National Forum on Education Statistics, 2009 (p.v).

The Ministries of education need to develop EMIS that could be relevant to all educational stakeholders. An effective and efficient EMIS should also be able to meet expectations of donors who would wish to see managers administer educational systems more efficiently and effectively as well as guide the governments to identify priorities and allocate resources according to the sector demands. EMIS should enhance the government's ability to monitor policy implementation and evaluate outputs and outcomes based on objectives.

Methodology

Design of the study

The study was conducted at the Ministry's head office and two districts; Temeke which is in Dar es salaam region and Kibaha in Pwani region. The study used both qualitative and quantitative analysis methodologies with assumptions that the mixed method could generate comprehensive information and provide critical analysis of issues that could give better understanding of EMIS development processes.

For qualitative approach the study conducted interviews using questionnaires with open-ended questions. The method was participatory as it did not constrain respondents to talk about specific areas; it gave them more freedom to express themselves and share whatever they thought was relevant for the study. Questions were used to guide discussions and prompt the interviewees to give more insights about the issue. The interviews were mostly conducted in Kiswahili. Rossman and Rallis (2012) suggest the idea of using the language that is well understood by the participants and the interviewer. From this perspective it was comfortable to use Kiswahili because it is the national language and fluently spoken by everyone.

Although the average time for interviews ranged from forty-five minutes to one hour, sometimes it took more time depending on how issues were clarified. The qualitative interview was useful in gathering different opinions from different levels of decision makers at the Ministry and district levels. The method provided opportunity for respondents to explain why they might consider EMIS more or less important in their positions and what might be done to enhance its development. Some issues not included in the interview questions emerged during discussion

and they brought out more detailed information that enriched the study. This could be one of the strength of the qualitative interviews described by scholars such as Kvale and Brinkmann (2009) that interviews are powerful tools able to motivate respondents to express their feelings and demonstrates their experience beyond the study's expectations. Moreover, interviewees were able to critically reflect on their experiences concerning EMIS and explain its relevance and influence to their performance in respective management levels.

The quantitative analysis method was employed to gather information that could not be derived from qualitative inquiries. The study used metadata to generate empirical statistics about EMIS capacity in resource allocation and performance. The study also used documents to get information that assisted to make justification of the EMIS status. However, most of the findings were generated from the qualitative interviews.

Target population and selection criteria

Based on the centralized and bureaucratic system of governance in Tanzania, the study targeted educational officials who have influence and authority to make decisions and effect changes at different levels of education management. The target group for the study was the high-level management staff, the honourable Minister and the Permanent secretary. Others were senior administration and management officers. These were Directors, Assistant Directors and Principal Education Officers. Another target group was the EMIS staff at the Ministry, District Education Officers (DEO's) and the district education staff at operational level. District officials were

selected from two districts; Temeke in Dar es salaam region and Kibaha Mji in Pwani region². The study also included UNESCO technical staff from Dar es salaam office as representatives from Development Partners (DP's) or Donors who have been providing external support for EMIS development projects. However during the actual interview the high-level management officials (the Minister and Permanent Secretary) were not available for the dialogue. The number and positions of the target group for the study is presented in the table 5 below.

Table 5: Number and Role of Participants in Study Sample

Position	Level	Number	Description
Director	Ministry	1	Has authority and influence in decision making
Assistant Director	Ministry	2	Has authority and influence in decision making
Principal Education Officer	Ministry	2	Has influence in decision making
Senior Physical Planning Officer	Ministry	1	Has influence in decision making
EMIS Unit Personnel	Ministry	2	Has influence in decision making
District Education Officer (DEO)	District	1	Has authority and influence in decision making
District Education Personnel	District	1	Has influence in decision making
UNESCO Technical Staff	Donor	2	Development Partners for External support
Total		12	

Data collection

Data collection was mainly done through interviews and review of documents relevant for the study, such as

- Education Sector Development Program (ESDP),
- Medium Term Expenditure Framework (MTEF),

² Selection of the districts was based on two criteria: (1) their location was easier to reach and (2) the two districts were among the pilot districts for the ESMIS project.

- Ministry's action plans,
- EMIS development plan,
- Basic Education Statistics in Tanzania (BEST), National Data and Regional data booklets.

Most of the quantitative data, particularly the empirical statistics, used to provide justifications of issues, was extracted from those documents. The qualitative data came from interviews. Before the interview, appointments were made through phone calls and physical visit to the respective offices. Then sessions for the interview were scheduled for each participant. It was difficult to make an appointment with the senior management officials such as directors who were most of the time working outside their offices. Sometimes the meetings for the interview were cancelled and rescheduled. The interviews were done in form of discussions guided by questions from the questionnaire. The interviews were conducted in a very friendly way and participants were very cooperative and willing to provide their opinions concerning EMIS development and its relevance to them. The interview took approximately forty-five minutes to one hour. Participants' responses were written at the space created below each question in the questionnaire.

Data analysis

Data and information gathered from the interviews was analysed by using a matrix table. For each research question, there were other specific questions used to get detailed information from the interviewees. Those answers were written against those questions in the matrix. Then the common answers were sorted and tallied together. Merging similar answers helped to create main themes for analytical discussions.

Findings

The research questions focused on three areas:

1. **the perception of impact of EMIS.** The main purpose is to explore understanding of the management staff about EMIS, specifically how relevant EMIS is to the management officials responsible for its support and sustainable development.
2. **the perception of organizational readiness.** The aim is to find out whether management staff has general understanding of their roles, that they are required to mobilize technical and financial resources to enhance EMIS activities, and utilize EMIS to perform their management roles.
3. **the perception of external support.** The intention is to capture management staff attitude towards donors' interventions for EMIS development, specifically how decision makers perceive external support and its influence on building local EMIS capacity and whether the partnership between donors and local management would eventually improve EMIS functions and ensure its sustainability.

Perception of impact of EMIS

Opinion about quality of EMIS data: accuracy, validity, reliability and timeliness

Regarded to respondents' comments, the study realized that the management officials were not precisely confident with quality of EMIS data. Most of the respondents at ministry level argued that they often encounter mismatch between EMIS data and the actual situation prevailing in

different levels of education delivery and management. They reflected on the entire process of data production and identified some weaknesses such as lack of efficient and effective mechanism to validate and control quality of data collected at schools/institutions and districts levels. They also showed doubts about data accuracy in the resource constrained contexts within which EMIS operates, and remarked that it is common to get data from schools and districts with errors as most of them are limited to technology that caused them to work manually that increases probability of making errors.

Moreover, poor storage and management of data which is a normal situation in a limited resource settings, schools and districts get difficulties to either retrieve or update data and information in their local databanks. The majority stated that schools and districts have low skills and knowledge about statistics and education indicators that might contribute to increase errors in the data they submit to the EMIS unit. Nevertheless, the observed low capacity of the EMIS unit prompted the management staff to question about the authenticity of EMIS data and suspected that sometimes data is manipulated so that it could portray what management authorities would like to see according to the education sector's and sub-sectors' expected outputs and outcomes:

“I do not trust EMIS data. It has a lot of errors. Those figures they provide are not correct at all, when I want to work perfectly I prefer to collect my own data from the sources that I believe they can be more accurate and valid” (Ministry Management Staff member).

However, all management staff reported that regardless of those discrepancies EMIS unit is making some progress to improve its performance at the national and district levels.

Knowledge about efficient EMIS model

The study observed that the management staff would like to have an EMIS that is able to produce relevant quantitative and qualitative data and information that provides answers to the emerging policy questions. Practically they needed the EMIS to provide more analytical information rather than descriptive statistics which is not easy to understand especially when the user has limited statistical knowledge;

“I am not interested with numbers, what I need is detailed analytical reports which show how we are progressing. We need to monitor outcomes and impacts of policies, we need to predict results of our initiatives and compare our performance. We need EMIS that could be able to make projections of trends and patterns of the sector progress and give alerts for critical issues”(Ministry level Principal Officer).

Moreover, 3/4 of the respondents needed a comprehensive EMIS which will provide data and information that focus on teaching and learning process. They reacted that EMIS should be able to track learners’ performance and inform policy makers about curriculum related issues.

Nevertheless, the majority wanted EMIS that could be accessible to all stakeholders at all levels and its content should be well understood by all users. They also emphasized that EMIS should not discriminate its users. They cited an example of the current EMIS, which uses English (a foreign language) to disseminate its data and information, while the local and official language is Kiswahili.

All respondents at ministry and district level mentioned that EMIS should be able to involve all departments and subsectors in planning and implementing its tasks. They argued that in the meantime EMIS is disconnected and fragmented, and it works at its own interest. They also

needed EMIS that could respond to their demands and not influence them to accept whatever it is delivered to them.

Knowing decision makers' strategies to ensure utilization of EMIS data and information at all educational management levels

Majority of respondents at the ministry level revealed that there were no particular efforts to ensure that EMIS data and information is effectively utilized to improve job performance and foster policy reforms based on relevant information and data at all educational management levels. Half of respondents at the ministry level reported that demand and capacity to utilize EMIS data is very limited. Perhaps they needed more training and sensitization to be able to accept and access EMIS data. One of the Ministry's Directors said:

“We do not use EMIS data regularly; I should say that this is our weakness. We mostly use data during critical moments such as the national budget sessions or when political issues arise” (Director at the Ministry).

One of the Principal Officers at the ministry strongly reacted:

“EMIS data is not intended to serve stakeholders' demand, EMIS works very hard for things which are not very relevant, and I have no idea of how to ensure utilization of data which have little relevance, why EMIS did not conduct needs assessment for its users”? (Principal Officer at the Ministry).

Besides, the district educational officials appreciated that partly EMIS had influenced changes in their performance. They have started to emphasize on the use of data in the progress reports that

are presented to the District Council Management Team and District Councilors' meetings. However, the data used is more quantitative and mostly shows enrollments, number of teachers and infrastructures.

Informed about other users of the EMIS data and information

Majority of the respondents believed that demand for EMIS data is still low among stakeholders. However, they assumed that EMIS data would be important to other sectors such as health, water, finance, and communication for their policies implementations. The majority of respondents also stated that EMIS data is rarely used by politicians and then probably for individual interests. Moreover, they mentioned development partners such as the World Bank, United Nation Organizations, European Union Organizations and other international communities that are frequent users of EMIS data. Most of the respondents made assumptions that students and researchers also have high demand for EMIS data. One of the Principal Officers at the Ministry level stated:

“I believe that demand for EMIS data is very low. Probably stakeholders are not informed about EMIS data, or data is not useful to them. May be they do not see its relevancy because they are not involved in the production process” (Principal Officer at the Ministry).

The Ministry officers kept insisting that stakeholders would need EMIS data but it is mostly quantitative with too much numbers presented in tables, hard to interpret, limited access, described in a foreign language which is not understood by local users who are the majority.

Perceptions of organizational readiness

Understanding their roles in facilitating EMIS activities

All respondents had a general understanding of their roles, that they are required to mobilize technical and financial resources to enhance EMIS activities. All were aware of their responsibilities for coordinating EMIS related activities to their respective departments; they are aware that they are required to provide inputs needed for EMIS. However, they feel that the EMIS unit is not well coordinated and organized, making communication across subsectors more difficult. Most interviewees regarded EMIS as a unit that works in isolation with other subsectors and dictates on kinds of data and information it would like to produce. They also commented that the EMIS unit rarely consult other departments, making it difficult for them to understand specific roles they are required to perform with EMIS.

Understanding the workforce needed for the precise EMIS

Asked whether they have knowledge about the EMIS staffing level and professionalism, all respondents at the ministry and district levels were not sure about competencies required for the EMIS personnel. They did not exactly know how diverse the EMIS staff should be. One Ministry Director stated:

“I do not know exactly what the qualifications and job descriptions for EMIS staff are. I think we need structural reform and job analysis that clearly defines roles and responsibilities of the EMIS staff. At this moment, I cannot specifically state how the EMIS staff should be organized” (Ministry Director).

However, a quarter of respondents randomly mentioned categories of staff they thought would be important to manage EMIS tasks. They listed professionals such as Statisticians, Economists, Planners, and Educationists. Others included Information Technology Specialists for database and website management, and computer systems analysts. All respondents admitted that the existing EMIS personnel have low capacity to manage the EMIS functions. Concerning the extreme attrition of EMIS staff, they suggested that it could be more practical if EMIS would have job analysis and succession plans for its staff so that replacement for the vacancies caused by retirement or other reasons for staff attrition could easily be done.

Perception of external support

Opinion about financial and technical support offered by external (international) donors

Most respondents at the ministry and district levels appreciated donors' support for EMIS development. They admitted that donors' support is useful regarding the technological challenges that complicate their plans. Nevertheless, a minority of the respondents perceived external interventions as the way of imposing their policies and gaining control of the local authorities. They also cautioned that donors' support does not guarantee sustainability of developmental programs or projects as they have specific objectives in a specific period of time. They believed that donors' objectives focus on building capacity but in some instances it reduces local creativity and ownership. One ministry director said that when donors dictate policy options, they limit choices for planning and implementation strategies and that donors' options increase complications for implementation processes:

“It is difficult to sustain donors’ projects. They are often expensive in terms of salaries for IT experts and other management costs” (Ministry Director).

Two respondents, one from the ministry and another from the district, strongly challenged the Ministry for continually accepting donors’ support. The ministry Principal officer stated:

“It is not necessary to receive donors’ funds; we must rely on our own resources. Too much support causes us to become lazy and unable to sustain our developmental programs” (Ministry Principal Officer).

These two respondents recommended that the Ministry should accept the reality that donors’ support should be used to supplement internal efforts instead of being the main steering rod.

Understanding management perception about donors interests in developing EMIS

It was impressive to explore what the interviewees thought about donors’ interest in supporting EMIS development processes. A majority of the respondents associated external support for EMIS development with global economic patterns in which information systems play a great role in giving power for management and control of the globalized economic systems. They perceived donors’ support to EMIS as means of creating a tool that assists in developing a standardized model of educational systems across the regions. The externally designed EMIS can produce data and information in standardized formats that make it easy to compare performance of different educational systems at different levels. The comparative data can provide evidence that validates the imposition of externally formulated educational policies such as Education for All (EFA) and Millennium Development Goals (MDG’s) to which a government has no

objection. Therefore, these respondents perceived donors' support to EMIS as strategies to get data and information that could support international missions for education and other economic matters.

Nonetheless, most respondents perceived that data and information give donors more capacity to monitor implementation progress and evaluate achievements of their goals and objectives. In some circumstances, donors' interventions provide them with opportunities for further learning. Donors can use technical assistance to pilot their programs that can help to make further improvement. For instance, donors can install the EMIS databases to test how it works before customizing them for other educational systems.

Moreover, two respondents at the ministry level argued that donor-imposed policies sometimes delay or derail national educational structures and systems. They cautioned that recipient countries should be careful of accepting those supports. They also perceived donors' support as ways of creating jobs for themselves, especially when they control the technical know-how. For example, when external experts develop EMIS database and keep the source codes or limit access for database modification, local experts would not be able to do anything unless they consult them. The Ministry Principal officer stated:

“They are required to teach us how to fish and not to provide fish, because when they leave everything stops. Their support provides only temporary solutions to the problems we have” (Ministry Principal Officer).

However, all respondents expressed the understanding that, in the current situation, the government has challenges in technology competency. Therefore, it needs to collaborate with

development partners in planning and managing programs and projects so that it can make progress in its strategic development plans.

Recommendations for Improving EMIS

Restructure the EMIS Unit

To improve EMIS functions, the management officials need an EMIS unit that has good coordination and communication with all subsectors through their respective departments. Also, the institutional arrangement of the EMIS functions should focus on establishing communication links that will ensure that all departments at the ministerial level are well informed and updated on EMIS operations. There is a need to review the current EMIS settings in the Ministry's organization structure and create a new location that fits the more interactive model (refer to figure 4 above) that can provide more access to enrich and share EMIS resources. Adam, et al (2011) highlight the fact that the location of EMIS within the Ministry or any educational organization plays a great role in determining the level of its performance. Placement of EMIS is a necessary aspect of enhancing collaboration, information sharing and integration of inputs and outputs from different sources within the education system and other related sectors.

Emphasize participatory approach for preliminary EMIS planning

The EMIS unit should involve key stakeholders in designing and planning processes of its functions. It might be more viable for the EMIS unit to conduct needs assessment that will help

to identify stakeholders' preferences for data demand. Reflecting on respondents' emphases on increasing users' acceptance and appreciation levels of EMIS outputs, it is important that EMIS data and information design should match with both macro-policy and micro-policy priorities at management and operational levels. The EMIS inputs should aim at producing outputs that meet requirements of the users.

Increase legitimacy of EMIS data and information

There is a need to increase credibility of data and information generated by EMIS by creating policy frameworks and guidelines that can govern its performance. EMIS can effectively execute its functions if it is guided by regulations that define different roles and responsibilities, and increase accountability to its hierarchical levels of operations. For instance, EMIS should have a mandate to enforce penalties or sanctions as ways of strengthening data collection, validation, and record keeping at the data sources, particularly at school and district levels. SADC (2009) provides similar recommendations that it will be more relevant and effective if EMIS policy is encoded within the national statistical policy frameworks that provide custody and increase confidence to delegate its functions.

Strengthen participation of high level management in EMIS development plans

In the existing bureaucratic and centralized administrative and management system, the involvement of high level management authorities who are decision makers and accountable

officers is mainly done at the very initial stages of signing memorandums of understanding or financial and technical support contracts. Thereafter, external consultants mostly collaborate with technical staff at the operational levels without putting a remarkable emphasis on engaging the management staff in understanding technical matters. This shortcoming contributes to reduce government commitment and accountability to support EMIS development initiatives that threaten its sustainability. It can be more feasible to conduct orientation programs and training sessions regularly for the management staff in order to familiarize them with all areas of EMIS specialties that might help to nurture a sense of ownership and make them consider EMIS among the ministry's key priority areas that need allocation of a considerable amount of funds and other resources that can sustain its functions.

Build the capacity to run EMIS

The observed low human capacity in EMIS unit requires tangible strategies that will focus on creating a required manning level so that it can balance with the actual workload. In addition, the EMIS needs to establish a succession plan that will gradually replace staff who leave the job for different reasons such as official retirement, transfers associated with promotions, or quit the job. Moreover, there should be regular training programs to ensure that EMIS staff is well equipped with knowledge and skills that are necessary to improve their proficiency and increase confidence in performing their duties.

Review EMIS routine work schedule

The EMIS routine work schedule contributes to the amount of errors of data collected at all levels. The actual data production process starts in March every year when schools and institutions fill in the questionnaires that are then sent to the districts (for pre-primary and primary schools) or to the Ministry (for secondary schools and teacher training colleges). The remaining higher learning and vocational education institutions send their questionnaires back to their respective subsectors' database centers (refer to figure 1 above). In June every year, the EMIS unit publishes the BEST booklet.

A three months' timeframe is not realistic because it is too short for the highly demanding task of producing quality data that can ensure its accuracy, reliability and validity. The review of timeframe for data production cycle is crucial. It would be ideal if the time frame were rescheduled to reflect the realities according to the existing EMIS limited workforce, other resource constraints and the continual increase of workload that is caused by the education sector's expansion.

Moreover, EMIS should find more ways of disseminating its data that will ensure access to all stakeholders at all levels. EMIS can use mass media such as radio, television, newspapers and fliers to inform the public about educational data and send feedback to the data providers and the community. Nevertheless, the EMIS staff should be proactive and creative in pioneering changes for progressive improvement of data quality and information that they produce.

Conclusion

The government of Tanzania should strengthen the Education Management Information System (EMIS) to ensure that it leads to educational policies based on accurate, valid, relevant and timely data and information. The Tanzanian education system is not isolated from other education systems in the world. Therefore, a well-developed EMIS will support the government to modernize management of the education sector ((Hua & Herstein, 2003) so that it can comply with internationally standardized models that emphasize evidence-based decision making for policy formulation, planning, monitoring and evaluation of the education sector performance. However, the EMIS itself needs policies that clearly define its roles and provide a roadmap that enables it to accomplish its objectives of helping the education sector to improve its performance.

Despite the financial and technical challenges that obligate the government to receive donor support, the government might hold the supremacy and take the lead in ensuring that EMIS gets sufficient and necessary resources that conform to the actual demand, which is created by subsequent sector's expansion. Nevertheless, the EMIS might ensure that it influences the government and other users to demand and utilize its outputs by producing quality data and information that provides answers to the policy questions.

Moreover, the EMIS development strategies must focus on creating user-friendly interfaces that give broad choices for end-users to access data and information in different formats that can be

convenient to them. EMIS will become more valuable only if it is positively perceived, accepted and effectively utilized by all stakeholders at all levels.

Further research should explore EMIS perception, acceptance and its relevance, particularly in the lower education management and delivery levels, which are the primary providers of education data and information. It is important to gather information that will be useful in improving the current EMIS and building a system that serves stakeholders' interests and demands.

Management officials appreciated the ongoing efforts of creating changes and improving EMIS performance. They emphasized that EMIS must continually be strengthened so that it can increase its efficiency in producing authentic data and information that liaises with stakeholders' demands. The management officials underlined the importance of linking EMIS functions with national priorities, which are stipulated in the educational policy reform programs. They also emphasized the importance of looking at existing structural disconnect between the EMIS unit and educational management authorities at all administrative hierarchies, and finding ways of creating strong links between EMIS and other departments at the ministerial levels. Decision makers and other educational managers at the district and ministry levels have a low appreciation for and knowledge about EMIS. Therefore, it is important to motivate decision makers to utilize EMIS outputs, thereby increasing their commitment to and accountability for EMIS functions.

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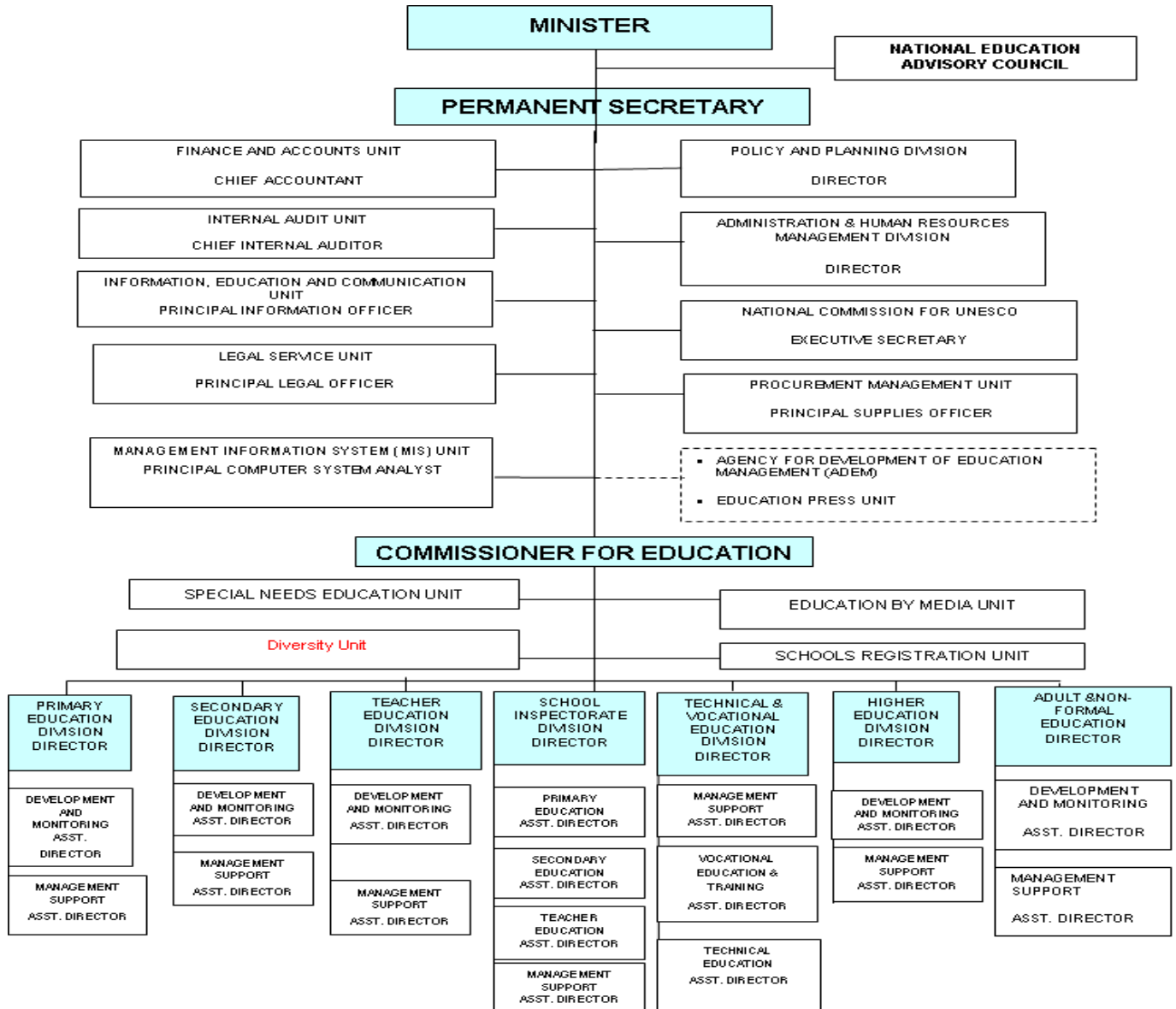
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Annexes

Annex 1: Organization Structure of the Ministry of Education and Vocational Training (MoEVT) - Tanzania



Source: MoEVT website; www.moe.go.tz, (2011).

Annex 2: Questionnaire

UNIVERSITY OF MASSACHUSETTS AMHERST CENTER FOR INTERNATIONAL EDUCATION

“Strengthening the Education Management Information System (EMIS) in Tanzania: Government Actors’ Perceptions about Enhancing Local Capacity for Information-based Policy Reforms”

INTERVIEW QUESTIONS

INTRODUCTION

This research study attempts to explore efficiency and effectiveness of an Education Management Information System (EMIS), given the current situation that stakeholders strive to achieve educational goals and use EMIS as a tool for evidence-based planning, managing, and monitoring and evaluating education sector performance in Tanzania. The main interest of this study is to gain better understanding of decision makers’ perceptions and opinions about an efficient and effective Education Management Information System (EMIS), and how it is affecting the planning and decision making process in regards to the sector’s roles and responsibilities. The results of this study can be useful in helping the Tanzania’s Ministry of Education and Vocational Training (MoEVT) and other stakeholders gain more insights about EMIS that probably can trigger more demand for quality data which might lead to the formulation of quality sector policies and plans which will eventually produce quality outcomes.

Research Questions

1. What are the perceptions of decision makers at national and sub-national levels about EMIS?
2. How does EMIS influence decision makers at national and sub-national levels in utilizing data and information for evidence-based planning, and monitoring and evaluation of the education sector performance?
3. What do decision makers think about external donor funding of EMIS development?

Name of the participant

Position

Department/District

Interview Questions

1. EMIS is a tool for planning, implementing, and monitoring and evaluating education sector performance. What is your specific role in facilitating EMIS functions?

2. What is your view about data which is produced by EMIS, in terms of its accuracy, reliability, and timeliness?
3. How do you feel about the current EMIS performance?
4. Basically, what do you expect an efficient and effective EMIS should be able to do for the education sector?
5. Continuously EMIS has been experiencing attrition of its staff without concurrent replacement of them. What kind of staffing level do you suggest does an efficient EMIS needs?
6. What is your opinion about financial and technical support provided by international donors?
7. What is your opinion about donors' interventions in EMIS development processes?
8. What strategies do you have to make sure that EMIS data and information is used effectively at all management levels?
9. What kind of improvement is required for collection, process, analysis, dissemination and management of EMIS data and information?
 - Data collection
 - Data processing
 - Data analysis
 - Data dissemination
 - Data management
10. Apart from education sector, who else is interested in educational data?

THANK YOU