2014:26 Sida Decentralised Evaluation

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Final Report

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# Abbreviations and Acronyms

| | |
|---|---|
| AVU | African Virtual University |
| ESDP | Education Sector Development Programme |
| FYDP | Five Year Development Plan |
| ICDL | International Computer Driving Licence |
| ICT | Information and Communication Technology |
| MoEVT | Ministry of Education and Vocational Training |
| OUT | Open University of Tanzania |
| PEDP | Primary Education Development Plan |
| TBT | Tanzania Beyond Tomorrow |
| TIE | Tanzania Institute of Education |
| TC | Teachers' College |
| UDSM | University of Dar es Salaam |
| USD | United States Dollar |

# Preface

This End-of-Project evaluation of the Implementation of ICT in Teachers' Colleges in Tanzania was commissioned by the Embassy of Sweden in Dar es Salaam, Tanzania, through Sida's framework agreement for reviews and evaluations.

Indevelop carried out the evaluation between January – April of 2014. Anna Liljelund Hedqvist was the Project Manager with overall responsibility for managing implementation and the process of the evaluation.

The independent evaluation team included the following key members:

- Bernt Andersson, Team Leader, from Indevelop
- Paula Uimonen, contracted by Indevelop
- Edephonce Ngemera Nfuka, contracted by Indevelop
- Suleman Sumra, contracted by Indevelop
- Adam Pain, Evaluator and Quality Assurance, member of Indevelop's Core Team of Professional Evaluators
- Maria Augusti, Regina Monyemangene and Juliana Kamaghe from the Open University of Tanzania, responsible for data collection from Teachers' Colleges, contracted by Indevelop

This report was circulated in draft form to the Embassy of Sweden in Dar es Salaam and Ministry of Education and Vocational Training and their comments have been incorporated in the final report. All photos are by Paula Uimonen. Cover photo: ICT lab in Morogoro Teachers' College.

# Executive Summary

This is an evaluation of the ICT in Teachers' Colleges project implemented from 2005 to 2008 by the Ministry of Education and Vocational Training (MoEVT) in Tanzania with funding of USD 3,733,000 from the Government of Sweden through Sida. All 34 government Teachers' Colleges were provided with training, up to date ICT equipment and broadband internet connection. The developmental objective of the project was to improve the quality of education in Teachers' Colleges and schools by integrating ICT in teacher education in order to make all student-teachers ICT literate and able to use ICT in their teaching upon completing their programme.

According to the Terms of Reference (ToR), the overall objective of the evaluation was to find out what actually had been achieved, what lessons were learnt during the program implementation and to establish what can be improved in the ongoing implementation of the initiative. The ToR also stated that the evaluation should focus at the level of outputs and outcomes while considering the potential for long term impact to be achieved.

The evaluation took place in February-March 2014 and included a 3 week visit to Tanzania including visits to the lead Teachers' College of Morogoro and 12 other Teachers' Colleges.

The evaluation found that five outputs out of six were achieved at the end of the project. The output about basic ICT training was not fully achieved since the project did not manage to train all tutors.

Three of the four specific objectives were achieved while the objective of using ICT for teaching and learning was partially achieved. A survey done by the evaluation team in 12 Teachers' Colleges (see chapter 1.4) showed that 44% of tutors reported that they use ICT for teaching and learning while the indicator was 80%. However, 62% of the tutors were using the Internet for sharing knowledge, which was much higher than the targeted 20%. Some of the expectations of the project initiators were, in hindsight, unrealistic.

The long term objective was partially achieved, but an insufficient number of computers at Teachers' Colleges and unreliable internet connections have been obstacles for the preparation of student-teachers to teach ICT and use ICT in their teaching. It was desired at the onset of the project that colleges should have at least one computer per 15 student-teachers, which was not quite achieved by the project. There are now 1,201 functioning computers for 23,281 students (2013), which is about one computer per 20 students. This shortfall needs to be addressed to ensure that skills and knowledge that students have gained is put to use.

To introduce ICT for teaching in primary and secondary schools, the number of computers and allocation of funds will have to be significantly increased. The most ambitious programme for ICT in the education sector is the Tanzania Beyond Tomorrow (TBT) project[1], with a total cost of USD 188 million over ten years. Instead of developing a parallel project, Sida may consider supporting the project after carrying out an appraisal of it. In the implementation of the ICT initiative, the availability of both mobile and non-mobile technologies should be considered. These will help in technology use and integration (with mobile ones, like laptops, mobile phones, tablets, projectors) especially for teachers and skills development for students and student-teachers (with non-mobile ones in the Labs).

Tanzanian education policies and plans are supportive of ICT in education. It is expected that student-teachers graduating from Teachers' Colleges will provide the necessary momentum to teaching ICT in primary and secondary schools. It is expected that student teachers will also use ICT as a tool for accessing the most up to date content knowledge and gain from using various sites which provide information on relevant pedagogies. It is expected that over time, ICT will become part and parcel of teaching and learning in primary and secondary schools. Currently there are syllabi for teaching ICT in schools, but lack of trained teachers to teach the subject and non-existent infrastructure means that the subject is not taught in most schools. The syllabi focus more on teaching ICT as a subject rather than using ICT as a learning tool.

The project was efficiently managed and there was considerable commitment from MoEVT, contributing to overcoming the initial problems with delays in appointment of the project staff and with delays in procurement. From 2009, the programme under MoEVT was functioning well and training and functionality of the ICT equipment was maintained. From 2013, the programme has suffered from problems with internet connections, inability to continue the training and increasing difficulties in keeping the ICT equipment functioning.

In the absence of external technical services, the project developed in-house capacity, while making use of external expertise for pedagogical services. The Ministry would benefit greatly from strengthening collaboration with technical and educational institutes, not least for capacity development.

[1] Tanzania Beyond Tomorrow. e-Education Development Programme (2013/14 – 2023/24). MoEVT September 2013.

The project did not benefit from a gender analysis. Gender equality has not been mainstreamed or targeted by the project; consequently gender issues have not been prominent in the implementation or afterwards.

To be able to use ICT at school level, the government will have to take the next step of rolling out ICT and provide contextualised learning material at secondary school level. The number of computers will have to be significantly increased if quality of teaching and learning primarily at secondary school level is to be improved.

**Recommendations to MoEVT**

*Achievements of the objectives*

- As an initial phase ICT should be rolled out in secondary schools by establishing a computer laboratory in each school and providing internet connection for the laboratory.

*Project and programme management*

- ICT in teacher education needs to be re-prioritised to ensure that sufficient financial and human resources are allocated for the programme.
- MoEVT should strengthen collaboration with Ministry of Communication Science and Technology (MCST) for backup and support on technical issues relating to connectivity and ICT equipment and facilities.
- Department of Teacher Education in MoEVT should prepare a Strategic Plan for moving forward with ICT integration in Teachers Colleges, with involvement of stakeholders.
- A program coordinator should be appointed for the ICT in Teachers' Colleges programme
- The format for inspection of Teachers' Colleges should be revised to include the assessment of use of ICT in teaching and learning.

*ICT equipment and software*

- In the near future, the ICT equipment needs to be replaced. The Sun thin clients will come to the end of their life span and need to be replaced. The MoEVT should prepare for the replacement. A thorough cost analysis should be made of the future alternatives taking into consideration all aspects of use, all aspects of use, maintenance and costs that are total cost of ownership (TCO).
- The functioning of the ICT laboratories needs to be reviewed to maximise the use of both tutors and students, taking into consideration that tutors need separate laboratory facilities.
- There is a need for all tutors to have a personal laptop and/or other mobile technologies, either through the ICT programme or through subsidies for buying their own.
- Every classroom in the Teachers' Colleges should be equipped with projector and internet.

- All colleges need to have more reliable power supply from the national grid, and back-up systems to counter fluctuations.

*Internet connection*

- Exploit the opportunities to improve connectivity in Tanzania and re-think how to provide internet connection to Teachers' Colleges with broadband access at reasonable costs.

*ICT training and training in using ICT for teaching and learning*

- Training should be resumed and strengthened. More training is needed for those who have not received training together with refresher and on-going training (basic ICT training, technical training and training in the use for teaching and learning). In-service training could be used for most of this training.
- One option for content development is to use thematic peer networks – as a Wiki school content.
- The teaching of ICT should be revised focusing more on the use of ICT and less on the technical/theoretical parts of ICT systems.
- Partnerships should be developed with relevant agencies, like Tanzanian Libraries, Technical colleges, University Faculties.
- Provide support to tutors and students who are committed and motivated to use ICT and enhance ICT integration in Teacher Education through agreed approaches at college level.
- Establish and support panels of subject specialist tutors especially for Mathematics and Science so that tutors can prepare authentic study material resources and share within and between colleges using ICT.
- Graduating student-teachers with good performance in ICT should be posted in schools identified to be potentially equipped to host ICT subject so that they are able to practice.

*Maintenance and service*

- Support structure should be strengthened and decentralised to include also zonal technicians and college technicians
- Technicians with diploma level should be recruited for support and maintenance.
- Tutors be supported to build subject based digital content, through web browsing and research. The content may be modified/changed to fit the national curricula requirements. The digital content could be shared among the tutors in teachers' colleges. Tutors should be encouraged to use and improve the content and use it in their teaching.

**Recommendations to Sida**

There are two areas where there is a need to support MOEVT in furthering the use of ICT in education.

*ICT in schools*

- Hardly anything is known about how the student teachers graduating from teachers' colleges are using their ICT knowledge and skills in teaching ICT in schools and using it in their own teaching. A tracer study of the student teachers will shed light on the usefulness of the project.
- The ICT project did not have a measurable impact in increasing the quality of learning at the level of primary and secondary schools. The shortage of both teachers and textbooks hampers the learning in schools. One main conclusion from the evaluation is that the number of computers will have to be significantly increased if quality of teaching and learning, primarily at secondary school level, is to be improved.
- Sweden/Sida could assist with the roll-out of ICT in secondary schools.

*ICT in teaching mathematics and science*

- Tanzania currently faces a severe shortage of teachers in mathematics and science. There is an estimated lack of 26,000 teachers in these subjects, and with current teacher education, it will take at least 15 years to fill the gap. It is evident that a wider use of ICT for teaching and using the best teachers to develop online lectures that could be transmitted to a number of schools is one way. Another option that can be considered is to mass produce DVDs on various topics in maths and science and distributed to all the secondary schools in the country. There are many ways in which the shortages of teachers can be addressed.
- Sweden/Sida could support programmes which aim using ICT for teaching mathematics and science.

# 1 Introduction

## 1.1 BACKGROUND

The context for implementation of ICT (Information and Communication Technology) in Teachers' Colleges emanates from Tanzanian policy documents. The Tanzania Development Vision 2025 explicitly includes ICT by noting that 'The new opportunities that ICT is opening up can be harnessed to meet the goals of the Vision'. Both the National Information and Communications Technologies Policy (March 2003) and The ICT Policy for Basic Education (2007) stress the utilisation of ICT in primary and secondary education as well as in teacher training.

The Education Sector Development Programme (ESDP) 2008 – 2017 states the need to strengthen ICT in educational institutions for open learning. In 2007, the MoEVT developed an ICT Policy for Basic Education intended to guide the integration of ICT in primary, secondary and teacher education. The most recent Primary Education Development Plan (PEDP) III operationalises this commitment.

The ICT in Teachers' Colleges project spearheaded ICT in basic education, strategically focusing on teacher education. By covering all 32 (later 34) government teachers' colleges, this comprehensive effort envisaged what came to be considered best practice in e-learning in Africa, namely recognising the key role of teachers. Since 2005, the eSchool Forum had discussed the importance of ICT in basic education. Learning from the experiences of other countries, the eSchool Forum identified teacher education to be a strategic entry point for ICT in basic education, to be followed by ICT in secondary education, including in-service teacher training.

As reflected by the former Program Coordinator at the MoEVT:

*"The project laid the foundation for ICT in teacher education. The need was there, but we did not know how to integrate ICT. If the project had not taken place, things would be different now. The spill-overs of the project, like communication and resources, are even more than the specific objectives."*

## 1.2 THE PROJECT

In the period 2005 to 2008 the Ministry of Education and Vocational Training (MoEVT) in Tanzania secured funding of USD 3,733,000 from the Government of Sweden through Sida to implement a project on ICT in Teachers' Colleges. All 32 government Teachers' Colleges were provided with up to date ICT equipment and broadband internet connection. Primary beneficiaries to this initiative were the 32 government Teachers' Colleges with about 900 tutors and 16,700 student-teachers.

The Ministry committed to promote ICT in the education sector and identified teacher education as the starting point in the endeavour to introduce ICT. With the development of ICT technology and its use in education it was inevitable that Tanzania would have to introduce ICT in its schools and colleges. The Sida project can be seen as a preparation for this. Teachers trained by the colleges with expertise in ICT would be the pioneers for introducing ICT in schools. The Tanzania Institute of Education (TIE) had developed an ICT curriculum for primary schools (TEHAMA) and textbooks had already been produced.

The government of Tanzania supported the programme with annual funding of TZS. 500 million from the recurrent annual budget for the purpose of sustaining the initiative and with the aim of building a workforce of tutors in MoEVT with the capacity to integrate ICT as a teaching and learning tool. It was expected that tutors benefitting from the project will pass on the ICT knowledge to student-teachers who would eventually teach in primary and secondary schools. Development of a trained cadre of tutors in ICT was of highest priority throughout implementation. Selected tutors were given appropriate technical training in hardware/software installation and preventative maintenance: using the Cisco IT Essentials programme, while many more of the tutors were given the opportunity to learn Basic ICT skills using the International Computer Driving Licence (ICDL) programme followed by training on the use of ICT in teaching and learning.

After the completion of the project in 2009, ICT in Teachers' Colleges was continued as a program at the MoEVT, with funding from the Ministry's own resources.

**Development objective**
The developmental objective of the project was to improve the quality of education in Teachers' Colleges and schools by integrating ICT in teacher education in order to make all student-teachers ICT literate upon completing their course. Colleges would benefit from ICT use as a teaching and learning tool as well as for management purposes thus improving the quality of education in Teachers' Colleges and schools.

**Short Term Specific Objectives (Outcome level)**
The stages towards attaining the long term Development Objective are reflected in the short term specific objectives as stated in the Project description:

- Established workforce of highly trained tutors with appropriate skills and attitudes to apply ICT in enhancing teaching and learning;
- Improved teaching capacity through teachers use of Internet for accessing and sharing knowledge and experiences;
- Increased opportunities for professional development through online learning and distance education of teachers; and
- Improved transfer of information among Colleges of MoEVT.

The Project aimed at an integration of ICTs into Education in consideration of all the benefits to enhance teaching and learning that technology promises. The specific objectives were expected to be achieved from the following outputs.

**Outputs**
By the end of the project in 2008, the following outputs were expected to be achieved:

1. The required hardware (i.e. 976 computers, routers, printers, digital cameras) and software purchased and installed in all Teachers' Colleges,
2. A Lead College for coordination and support of ICT was identified (Morogoro Teachers' College),
3. ICT tutor technicians for ICT support trained in each Zonal college,
4. 906 tutors trained on basic ICT skills,
5. 148 specialist ICT tutors on use of ICT as a teaching and learning tool trained,
6. Management level staff in teachers' college trained in the use of ICT as a tool for improving management.

**Theory of change**
The project would provide training, ICT equipment and internet connections for all Teachers' Colleges in the country. The tutors at the Teachers' Colleges would use ICT in their teaching of student - teachers and also teach them how to use ICT in teaching and learning. The quality of teaching at Teachers' Colleges would improve.

The shortage of both teachers and textbooks hampers the learning in schools, clearly demonstrated by the low and decreasing passing rates, below 50% for primary schools[2]. One way of addressing this is to rely more on information and communication technology. When the student- teachers graduate, they would be posted to primary and secondary schools and use ICT in their teaching and for their own learning and sharing of knowledge. Ultimately, according to the project document, quality of education would improve through improved methods of teaching and learning, and students would be better equipped with skills and knowledge to earn a living and contribute to the development of the country.

**Organisation and implementation of the project**
The project was implemented by the MoEVT of Tanzania through an Agreement with Sweden/Sida. The responsible unit at the MoEVT was the Department for Teacher Education, which had the overall responsibility for monitoring and evaluation of the project as well as for facilitation of the overall management of the implementation.

[2] 49.4% in 2009 according to Basic Education Statistics of Tanzania. MoEVT 2010.

A steering committee was set up for the project, with representatives of the main stakeholders from the ministry, the Teachers' Colleges, secondary schools, the University of Dar es Salam and the Tanzania Institute for Education (TIE)[3].

The lead Teachers' College for the project was Morogoro Teachers College, where the project office was set up, supported by consultants/specialists during the project. The lead college was responsible for developing the training and the training material, as well as for procurement and training.

There are seven educational zones, each with a zonal Teachers' College. These colleges were capacitated through training of trainers and technicians to provide support to the other colleges in each zone and to provide trainings and support. Each Teachers' College had two staff members/tutors trained to provide first level technical support.

## 1.3 THE EVALUATION

According to the terms of reference, the overall objective of the evaluation was to find out what actually has been achieved, what lessons have been learnt during the program implementation, and to establish what can be improved in the ongoing implementation of the initiative. The ToR also stated that the evaluation should focus at the level of outputs and outcomes while considering the potential for long term impact to be achieved.

The TOR also specifically stated that the consultants have to concentrate on what has happened at the Teachers' Colleges in the areas of Human Resources, ICT institutional policy, ICT in curriculum and assessment and e-learning, its potential to address education deficits in Tanzania, ICT use in tutor and graduate students pedagogical practice, ICT in management and administration, ICT in formal and informal professional development, ICT infrastructure and computer systems; (hardware and software), Internet connectivity, buildings and furniture and electricity power, by assessing the specified evaluation questions.

[3] Members were: MoEVT, Embassy of Sweden, Ministry for Communication, Science, & Technology - MCST Ministry for Finance & Economic Affairs MOFEA Faculty of Education – UDSM and Open University of Tanzania, University Computing Centre – UCC (UDSM), National Examinations Council of Tanzania - NECTA, Commission for Science and Technical - COSTECH, and Tanzania Institute for Education - TIE,

The evaluation has looked at the use of ICT in management and administration processes through a review of administration manuals and interviews of administrative staff. The issue of using ICT in teaching and learning, including assessments, e-learning and professional development, has been assessed as well, through interviews, observations and analysis of curricula. The ICT infrastructure has been assessed through inventories and on-the-site observations through visits to 12 Teachers' Colleges.

Since the project ended 5-6 years ago, the evaluation team suggested some modifications to the evaluation purpose and objective as follows:

- The evaluation will find out what was achieved and lessons learnt during the program implementation 2005-2008;
- The evaluation will assess the extent to which the project has been mainstreamed into a government program at the Ministry, Department and College levels:
- The evaluation will recommend what can be improved in the continued implementation of ICT in Teachers' Colleges;
- The evaluation will assess the impact to be observed after a longer period, at the time of the evaluation in early 2014;
- The evaluation will provide input to the implementation of the Swedish country strategy.

## 1.4 EVALUATION METHODS

The evaluation used both quantitative and qualitative methods, and did not seek to replicate the data already collected in Annual Progress reports and other reports. Data was collected from MoEVT, the lead Teachers' College in Morogoro, from 12 other Teachers' Colleges that were visited, and from other stakeholders. Interviews were conducted with MoEVT staff, Teachers' College tutors and student -teachers and other stakeholders, as well as with Sida officials, including some retired MoEVT and Sida staff. A list of persons interviewed is attached as Annex 5. For the Teachers' Colleges that were visited, the evaluation team collected the data specified in the Protocol in Annex 4.

In order to collect data for the indicators of the specific objectives, a survey in the form of a questionnaire was carried out by the evaluation team in the 12 Teachers' Colleges that were visited. The questionnaire (part of the Protocol in Annex 4) with 9 questions was distributed by the evaluators/data collectors to as many tutors as possible. In all 225 tutors filled in the questionnaire. The total number of tutors at the 12 visited colleges was 497 tutors (2013 data). Responses to the questionnaire are attached in Annex 2.

The terms of reference requested a visit to Morogoro Teachers' College and at least 12 others, three of which should be remote (rural) and very remote (off-grid). The

selected colleges should be a representative sample, although it was not possible to make a random selection, mainly due to the limited time for the evaluation and the travel time.

The most efficient way of arranging the visits within a limited amount of time and yet get a representative sample, including rural and very remote colleges, was to randomly select 4 of the 7 educational zones, and visit 3 colleges in each zone (one person going to each zone). The selection of zones and colleges was discussed at the inception workshop with the MoEVT and found to be a reasonably representative sample of all Teachers' Colleges regarding ICT resources and trained tutors in ICT.

In each zone it was decided to visit the zonal college and two other colleges. We travelled by air or car to the zonal colleges and by bus, car or boat from there to the other two colleges. It was decided to select the two other colleges based on the distance from the zonal colleges. In order not to spend too much time travelling it was agreed that the selected colleges should not be more than 8 hours away from the zonal college. The following Teachers' Colleges were selected and visited.

*Table 1: Teachers' Colleges visited*

| **Educational Zone** | **Zonal Teachers' Colleges** | **Rural Teachers' Colleges** | **Off-grid Teachers' Colleges** |
|---|---|---|---|
| 1. Southern Highland Zone | Klerruu (Iringa) | Dakawa (Morogoro) | Tandala (Iringa) |
| 2. Western Zone | Tabora (Tabora) | Kinampanda (Singida) | Ndala (Tabora) |
| 3. Lake Zone | Butimba (Mwanza) | Bunda (Mara), Murutunguru (Mwanza) | |
| 4. Southern Zone | Mtwara (Mtwara ) | Nachingwea (Lindi), Vkindu (Pwani) | |

The document review was initiated during the inception period and was continued when the international consultants arrived in Tanzania and received the remaining documents. The primary sources of written material are listed in Annex 6.

The field team was composed by Bernt Andersson, Paula Uimonen, Edephonce Ngemera Nfuka and Suleman Sumra, complemented by Maria Augusti, Regina Monyemangene and Juliana Kamaghe, travelling to and collecting information and reporting from 12 Teachers' Colleges. The team worked together on all aspects of the evaluation, but each team member had specific responsibilities for different sets of the evaluation questions. Findings have been shared and agreed, through continuous dialogue between team members.

# 2 Findings and conclusions regarding achievements

## 2.1 HARDWARE AND SOFTWARE PURCHASED AND INSTALLED IN ALL TEACHERS COLLEGES, OUTPUT 1

The project document states that by the end of project the hardware (i.e. 976 computers, routers, printers, digital cameras) and software (operating system and office applications) were to be purchased and installed in all Teachers' Colleges. It also indicates that all these colleges have to be connected to the Internet.

According to the Completion Report[4] and ICT equipment report of 2012, 1,293 computers (SUN RAY 270 thin client terminals) were purchased and installed in all 34 colleges with variation from 15 at Dakawa and Kitangali to 72 computers at Morogoro and Klerruu colleges. The amount of computers that were purchased and installed is higher than the originally planned due to the shift to thin client terminals with lower negotiated price compared to the planned desktop computers. Also two colleges, Dakawa and Shinyanga were added later. Other equipment including connectivity related ones that were purchased and installed are (number within parentheses) Sun X2200 Server (81), KVM Switch (34), Optical drive (33), 3000VA UPS (33), 34U Rack Cab (18), 12U Rack Cab (10), HP 3005 Printer (34), White board (68), Voltage stabiliser (34), HP Desktop (65), Projector (31), VSAT (34), Solar Power (4), Router (34) and Modem (34). In regard to software the open source software which are freely available were used both on server side (mainly Sun Solaris) and the client side (mainly Open Office).

At the time of the evaluation, which is more than 8 years since the inception of the project and 5 years since the project ended, the situation from the field and at the ministry indicated that most of the equipment and software are still functioning in a range, depending on the item, of 80% to 100%. Taking the case of Sun computers (thin clients) which is the major component both in terms of volume and cost, 1201 out of 1293 were functioning well according to the ICT equipment report of 2012, which is 93%. This is also indicated in the updated inventory of equipment statistics from the 12 colleges visited during this evaluation (Annex 3) where 72% to 100% of

[4] Completion report Second draft 16 September 2008

all equipment was still functioning and 90% of the Sun computers (thin clients), a major component of the equipment, being functional. It was desired at the onset of the project that colleges should have at least one computer per 15 teacher students, which was not quite achieved. There are now 1,201 functioning computers for 23,281 students (2013), which is about one computer per 20 students.

Apart from the equipment, software and connectivity that were put in place by the funding from the project, the evaluators learnt that several additional equipment such as desktop computers, laptops, printers, storage medias and software such as Moodle have been acquired, installed and are in use at various colleges including Morogoro, Klerruu, Kinampanda etc. This also applies to connectivity where in some places, rather than using the VSAT internet access from SATCOM that was unreliable and insufficient (3Mbps/1Mbps for all colleges), TTCL through relatively cheaper ADSL internet access was contracted for some colleges at 512 Kbps per each and the Internet access speed slightly improved. The additional equipment bought was funded by the ministry or the colleges themselves and in some cases by individuals, especially purchases of laptops, modems and storage media.

Apart from the information on the working and broken equipment as well as additional hardware and software that were added after the project ended, the findings from the inventory in Annex 3 also indicated perception of various users on the actual functioning of present equipment and associated software as well as connectivity. It was noted from the interviews with management, tutors and students that there are concerns regarding technical support capability, perceived ease of use, alignment to hardware/software used by majority in the public and private sector and slow internet connection. This was also supported by a survey (see Chapter 1.4 and Annex 2) that looked at how ICT equipment, software and connectivity, in these Teachers' Colleges were functioning. The findings from the survey, where 22% responded that the ICT equipment is functioning well, 28% that the software is functioning well and 23% that the internet connection is functioning well, indicated the need for improvement in most cases.

**Conclusion**

The Output was achieved when the project ended, and on average more than 90% of hardware and software purchased and installed in all Teachers' Colleges are still working, though some have broken down over time. The most affected hardware is HP Desktop Computers, UPS and thin clients computers. It was also noted that the purchased and installed equipment and software were useful long after the project ended and additional hardware and software have been purchased by MoEVT, the colleges themselves (and in some cases individual's tutors and student's tutors bought their own). While the selected hardware and software are considered to be ideal for such education institutions there were also concerns on the technical support capability, perceived ease of use, alignment of the hardware/software with that used in the public and private sector in Tanzania (Windows, MS Office), and slow internet connection.

## 2.2 LEAD COLLEGE FOR COORDINATION AND SUPPORT OF ICT IDENTIFIED, OUTPUT 2

According to the project document, the Ministry would identify a lead college to be the centre for ICT development and coordination. The lead college would develop curriculum materials for training, support colleges on technical issues, evaluate and host resources in electronic format, manage internet services and the project web site. The lead college would also be the location of the project office and project team.

Morogoro Teachers' College (MTC) was identified as the lead college. A project team was established to oversee all activities, consisting of 4 Tanzanian staff and one consultant from the U.K., all based in Morogoro. A program coordinator was appointed at the Teacher Education Department at the Ministry Headquarters, where the project was placed under the Director of Teacher Education. When the Ministry took over the project in 2009, the program coordinator was re-located to Mororogo. In addition to technical coordination and support, the project team developed ICT Guidelines on technical maintenance and computer lab management, some common material for ICT basic skills training, and some electronic resources. The team also managed the project web site at http://www.teachers.go.tz/.

The evaluation team visited Morogoro Teachers' College, which continues to be the lead college. The college has a project team of 4 staff (Chief Network and System Administrator, Assistant Network and Systems Administrator, Infrastructure Coordinator, and Assistant Curriculum Coordinator). After the retirement of the program coordinator in 2013, no replacement had been made and the team lacks a leader.

During visits to colleges, it was clear that Morogoro continues to be the main source for technical support for other colleges. Morogoro handles procurement, repairs of equipment, and contacts with service providers. The responsiveness of the team has, however, declined after the retirement of the coordinator and the centralised structure of technical support is cumbersome, especially for rural/remote colleges.

**Conclusion**
The output was achieved when the project ended and Morogoro TC continues to be the lead college in supporting other colleges.

## 2.3 TUTOR TECHNICIANS FOR ICT SUPPORT TRAINED IN EACH ZONAL COLLEGE, OUTPUT 3

The Project document states that the training will have two components, i) Initial training for ICT tutor and technicians and ii) ongoing tutor/technician training. Two tutor/technicians will be trained in each college and in the Teacher Education De-

partment of MoEVT, to install and maintain ICT equipment. Altogether 70 tutor/technicians should be trained.

According to the Completion Report[5], 74 tutor/technicians have completed the CISCO IT Essentials course I and II, giving each college at least one tutor/technician. Training was also provided in network installation (20 tutor participants) and Solaris system installation (7 tutor participants).

At the time of the evaluation, available information from MoEVT[6] about 19 of the Teachers' Colleges shows that there are currently 85 ICT tutors at these 19 colleges, an average of 4 ICT tutors per college. The visited colleges reported that almost all of the trained tutor/technicians are still there and additional ICT tutors trained in ICT in Education at the Open University have been hired. However, no additional training of tutor/technicians has been organised by the programme, or additional courses in CISCO IT Essentials or any comprehensive refresher training of those previously trained provided. However, there were trainings in Systems Administration for tutor technicians to support the Sun Solaris systems in the teachers colleges after the project ended.

**Conclusion**
The Output was achieved when the project ended, and almost all of the trained tutor/technicians are still working at Teachers' Colleges, but some have moved to other colleges or educational institutes. Additional training in Systems Administration has been provided by MoEVT after the project ended.

## 2.4 A TOTAL OF 906 TUTORS TRAINED ON BASIC ICT SKILLS, OUTPUT 4

The project document envisaged training of 906 tutors in basic ICT skills, through training of 70 trainers to ICDL standard, who in turn would train the 906 tutors using an adopted training package.

According to project documentation (2011), [7] a total of 546 tutors were trained and 177 tutors were ICDL certified, along with 40 Ministry officials/principals. The ICDL training varied, with 100 tutors having completed 6 of the 7 modules and 424 tutors

[5] Completion report Second draft 16 September 2008
[6] Email information 2014-03-14 from Nzuka
[7] ICT in Teacher Education. Transforming Teaching and Learning through ICT. MoEVT and Sida. 2011

having completed only one or a few of the modules, according to the completion report of 2008. Meanwhile, 33 tutors had completed the ICDL certificate and were serving as ICDL trainers in diploma colleges. [8]

During visits to colleges, the lack of basic training was a recurring topic and many tutors requested more training opportunities. According to the survey (see Chapter 1.4 and Annex 2) conducted among 225 tutors from 12 colleges, as many as 76 disagreed (34%) of having been sufficiently trained in basic ICT skills, thus lacking enough confidence to use ICT. Since the ICT equipment was also considered insufficient or not available, it is unclear to what extent lack of training coincides with lack of practice, which is crucial for the development of ICT skills.

The need for basic ICT training for tutors was a recurring topic in suggestions for improvement in the colleges visited:

- Tutors should be trained well on the use of ICT
- Regular seminars and trainings should be conducted to update tutors
- Training for tutors in basic skills and using ICT in teaching
- Training to give confidence to use ICT in teaching

**Conclusion**
The Output was partially achieved at the end of the project. The lack of basic ICT training continues to be an issue, with far too many tutors lacking the essential skills to use ICT in teaching and learning.

## 2.5 ICT TUTORS TRAINED ON USE OF ICT AS TEACHING AND LEARNING TOOL, OUTPUT 5

The use of ICT as a teaching and learning tool has a potential to improve the quality of education provided in Tanzanian schools. The link between ICT and quality of education is discussed above under theory of change (page 12). ICT opens up a huge reservoir of knowledge through material available online, both the content knowledge of a subject and material on the best ways of delivering the content to students at different levels. Material produced by Khan Academy is but one example of available material. For tutors to use these online resources several conditions need to be met. These include:

[8] Completion report Second draft 16 September 2008

- Availability of internet on regular basis. Tutors should be able access internet when needed.
- Tutors should have the skills to be able to access the material and be able to judge the relevance and appropriateness of the material.
- The skill to package the material and use it to support his/her lesson. It should be part of the lesson rather than a lesson in itself.
- Motivation and enthusiasm to use the internet to improve his/her teaching skills. He/she should be able to build upon the initial training provided to the tutors.

The project document states that the first stage is to build a teaching force in which all teachers possess the critical skills and competencies required to use ICT as a tool in enhancing the teaching and learning processes. The project was to provide basic computer training to tutors and those achieving the International Computer Driving License (ICDL) were deemed to have attained the required skills to develop ICT in their teaching and learning. In all, 546 tutors were trained in ICDL and 177 tutors attained the ICDL certificate.

In addition, an effort was made to train tutors in the use of ICT in teaching and learning. The completion report notes that 69 tutors had completed training in ICT for teaching and learning and 14 tutors had completed training in ICT in Teaching and Learning with Science. After the project, this training continued. By 2011, 457 tutors had been trained in ICT for teaching and learning, including mapping web resources with subject syllabi, multimedia lesson presentations and using the Moodle Learning Management System. Furthermore, 103 tutors were trained in e-learning knowledge and skills through African Virtual University (AVU) and Open University of Tanzania (OUT), according to project documentation (2011).[9]

**Conclusion:**
This output was achieved.

## 2.6 MANAGEMENT LEVEL TRAINED IN ICT, OUTPUT 6

According to the project document, three workshops were planned with all principals and staff from the Teacher Education Department of MoEVT. The purpose of the training was to give the management knowledge in how to use ICT in their planning,

[9] ICT in Teacher Education. Transforming Teaching and Learning through ICT. MoEVT and Sida. 2011

computer maintenance and in the Education Management Information System (EMIS).

The completion report states that all three workshops took place with all principals attending. However, the principals that have been nominated after the project ended have not received any ICT training. From the interviews with principals at the colleges visited, it appears as if the training in management gave the principals general ICT knowledge – and 9 of them were also trained in basic ICT - and the main result seems to be that they are all using email frequently. Some colleges have or are currently developing student record systems. We found however that word processing and spread sheets are widely used. Reports are written using computers, the ministry requests information and sends tables to be filled in and Excel is used for student databases (Klerruu and Butimba), staff data (Ndala) and a college calendar (Butimba). Although only the principals received ICT training during the project, the evaluation found in the visited colleges that between 4 and 10 administrative staff have computers and are using them for administrative purposes.

**Conclusion**
The output was achieved.

# 3 Effectiveness

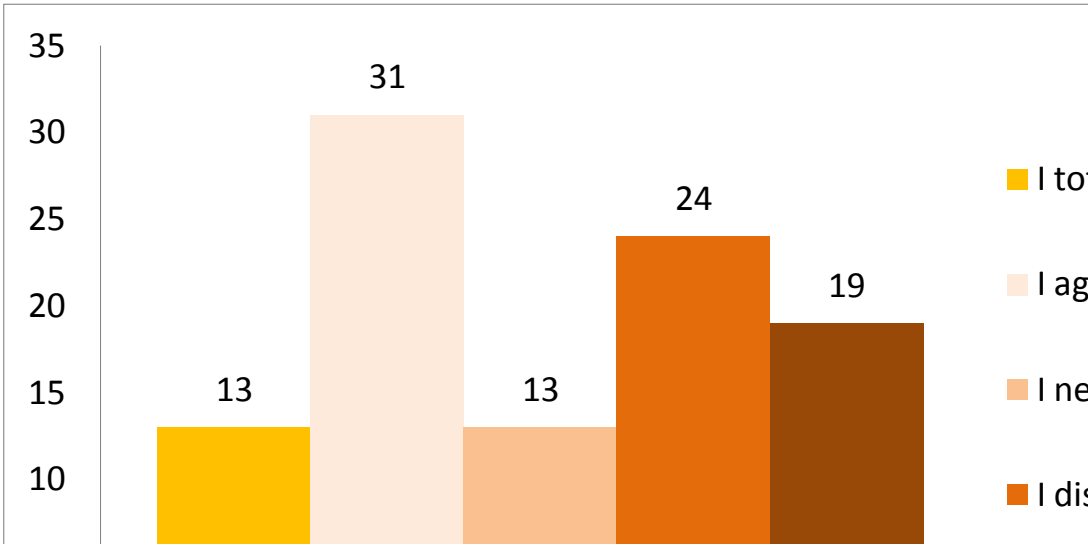
## 3.1 ACHIEVEMENT OF SPECIFIC OBJECTIVES

### 3.1.1 Specific objective 1: Established workforce of highly trained tutors with appropriate skills and attitudes to apply ICT in enhancing teaching and learning

The project envisaged that 80% of the tutors will use ICT in their teaching. The project had intended that 906 tutors would be trained in basic ICT skills and these tutors would use these skills in their teaching. By the end of the project, 546 tutors were trained leaving a significant number of tutors untrained. The assumption that 80% of all the tutors will use ICT in teaching and learning was dependent on providing training to 906 tutors (presumably all the tutors employed at the time). The end of the project document does not state to what extent the indicator was achieved.

One of the questions in the survey of tutors, done at the Teachers' Colleges that the evaluators visited (see the description of the survey questionnaire in Chapter 1.4 and all results in Annex 2) was on the use of ICT in teaching and learning (see the following figure).

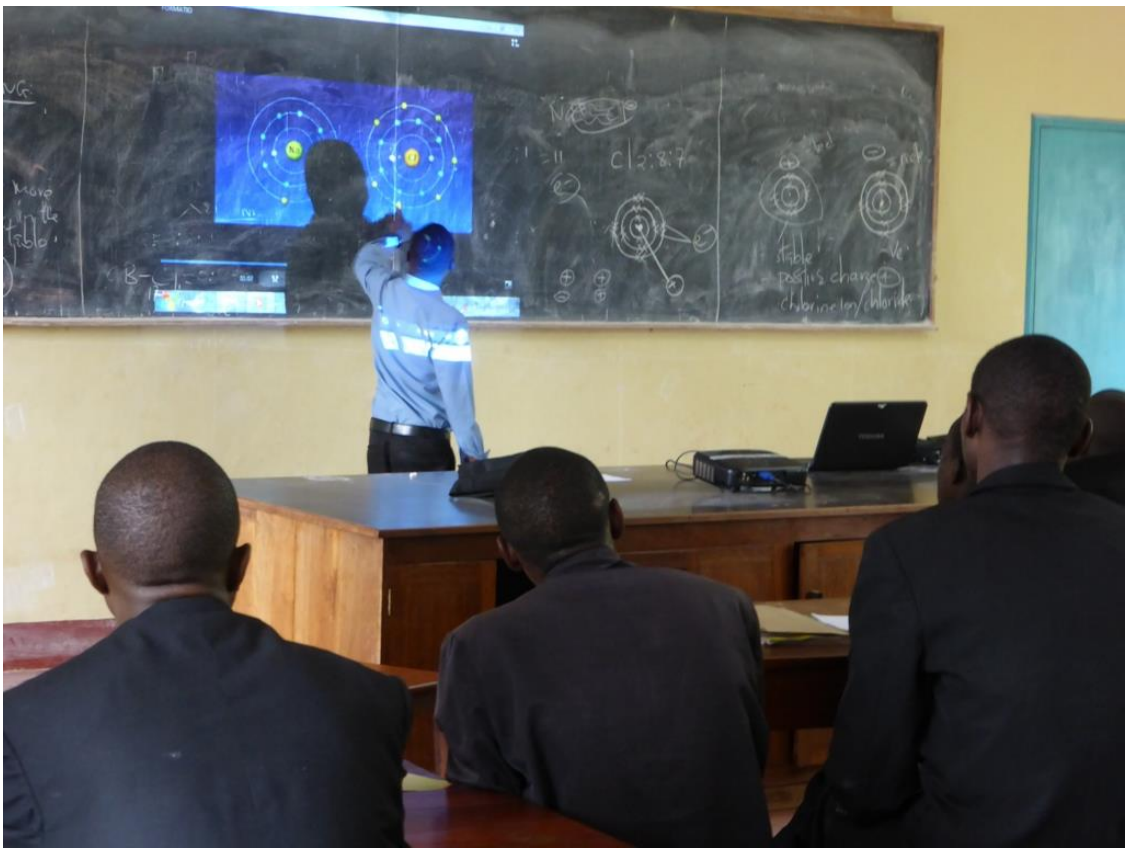
*Figure 1: I use ICT in my teaching and learning.*



According to the survey, only 44% of the tutors who responded stated that they either totally agreed or agreed to using ICT for teaching and learning purposes, a much lower number than the project indicator of 80%. The issue of tutors using ICT in their teaching was explored in discussions that were held with tutors in all the 12 colleges visited during the survey. Most of the tutors and management staff of the colleges agreed that the training was well conducted but argued that not enough tutors benefited from the training and the duration of the training was too short – not adequate for many tutors to enable them to apply the ICT knowledge to teaching. Meanwhile, the shortage of equipment, lack of broadband Internet access and irregular power supply are hampering the use of ICT in teaching, especially in class.

*"Infrastructure is not supportive to use ICT in teaching, not enough power, only one projector, too high number of students (78 students per session) and the class rooms are too small."*[10]

Even so, ICT is becoming part of teaching and learning at the Teachers' Colleges. More and more tutors are using ICT in their teaching and some colleges have purchased additional projectors for the use of teachers, although half of the visited colleges had only one functioning projector, three colleges had 2 projectors, two had 3 projectors and one college had even 4 functioning projectors (Mtwara). A significant number of tutors have purchased laptops and modems to enable them to search the web. There are tutors who use ICT for the whole teaching process, from preparation (downloading teaching material), to delivery (use of computer and projector in classroom) and follow-up (exams and student records managed electronically). An even



greater number of tutors use ICT to access and share online materials, which strengthen their teaching skills (see below).

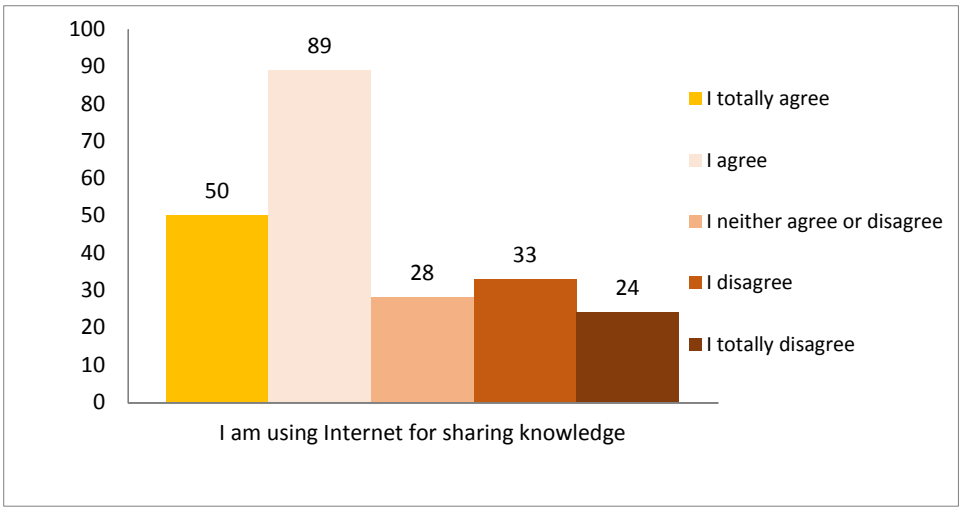
Klerruu College has advanced greatly in the use of ICT in teaching and learning, along with Morogoro, Mpwapwa and Monduli colleges. At Klerruu all tutors and students use Moodle, an online learning management system that is much appreciated. The use of Moodle has inspired many tutors and students to acquire laptops of their own, which is also encouraged by college management. There are several wifi access points on campus, and the Klerruu TC has connected the nearby practising secondary school. Having pioneered the use of Moodle, the college has also trained tutors from diploma colleges from the rest of the country. Although the college does not have enough bandwidth (despite a TTCL connection), the demand for 24/7 access all over campus is indicative of ambitions to fully integrate ICT in teaching and learning, according to international standards.

**Conclusion**
This specific objective was partly achieved.

### 3.1.2 Specific objective 2: Improved teaching capacity through teachers' use of internet for accessing and sharing knowledge and experiences

The indicator for this specific objective was that 20% of tutors would use the internet for sharing knowledge and experiences. This was also measured through the survey. The result is shown in Figure 2 below.

*Figure 2: I am using internet for access and sharing of knowledge and experiences.*




From the survey, 62% (139 respondents) responded that they totally agree or agree with the statement, far above the very moderate target of 20%.

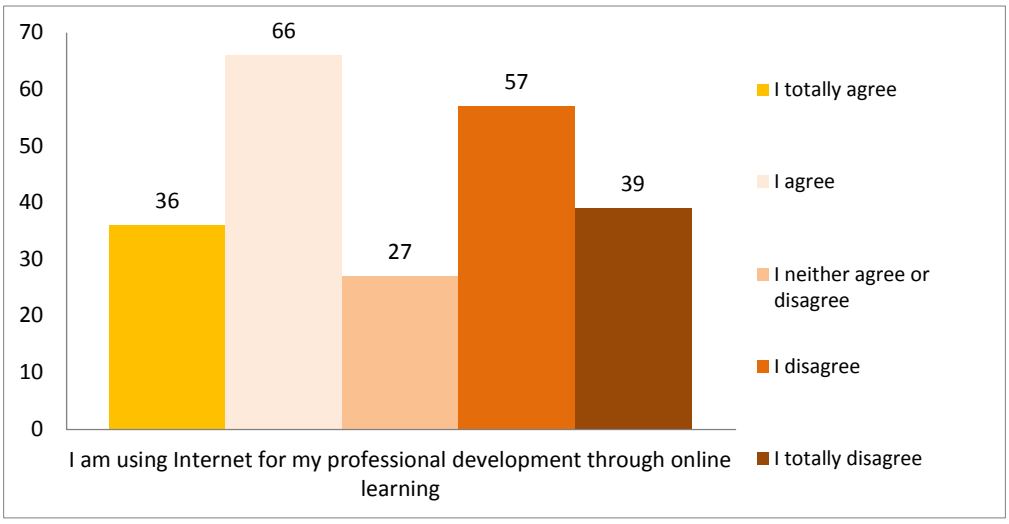
Even in the remote and off-grid Tandala College, tutors as well as student-teachers rely on the Internet to search for information, often using their mobile phones for access. Tutors also use email for knowledge sharing with colleagues in other places and other countries, and some are also members of professional online groups, like LinkedIn and Yahoo groups. The impact on tutor's professional growth/practices especially in facilitating teaching and learning in the college may be substantial for those tutors, but an assessment of the impact or sustainability of this is not within the scope of this evaluation.

**Conclusion**
This specific objective was achieved.

### 3.1.3 Specific objective 3: Increased opportunities for professional development through online learning and distance education

The indicator for this specific objective is the number of tutors who have attended online/distance education. No target was specified. This was also measured through the survey and results are shown in figure 3 below.

*Figure 3. I am using internet for my professional development through online learning, blended learning or distance education.*




The survey results indicate a rather high number of tutors (102 respondents) have used Internet for online learning (45%), often university-level studies through distance education. The following table shows the number of tutors responding using internet for professional development in each of the visited colleges.

*Table 2: Survey question. I am using internet for my professional development through online learning, blended learning or distance education (numbers).*

| Teachers college | I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|---|
| Bunda | 7 | 7 | 2 | 2 | 2 |
| Butimba | 4 | 4 | 3 | 6 | 0 |
| Dakawa | 1 | 5 | 1 | 2 | 1 |
| Kinampanda | 2 | 7 | 3 | 6 | 6 |
| Klerruu | 6 | 6 | 1 | 3 | 1 |
| Murutunguro | 1 | 4 | 3 | 4 | 9 |
| Mtwara | 2 | 7 | 3 | 6 | 1 |
| Nachingwea | 6 | 7 | 0 | 7 | 2 |
| Ndala | 1 | 3 | 0 | 3 | 6 |
| Tabora | 0 | 6 | 6 | 4 | 7 |
| Tandala | 1 | 5 | 2 | 6 | 2 |
| Vikindu | 5 | 5 | 3 | 8 | 2 |

Some examples can be mentioned:
-Murutunguru College:

- Some are using distance education to study Bachelor of Education and others use it to conduct personal studies.
- Some have taken course at the Open University of Tanzania.
- There are online courses but some feel they don't have access or exposure.

-Bunda College:

- Students use online material and books for their course in distance learning and they also use it for communicating with their supervisor on research.
- One has taken Masters in Education at the Open University of Tanzania and another on community development in China.

**Conclusion**
This specific objective was achieved.

### 3.1.4 Specific objective 4: Improved transfer of information among Colleges and MoEVT

The Specific objective is *"Improved transfer of information among Colleges and MoEVT"*. There is no indicator in the Log frame for this objective.

The evaluation has collected information through interviews of officials at the MoEVT and principals at the 13 Teachers' Colleges visited. The principals testified that they now use email for almost all communication with MoEVT and they send requested information via email. There has been a tremendous increase in communication via internet and the introduction of ICT has greatly facilitated communication.

**Conclusion**
The evaluators consider the coherent responses from the interviews to be clear evidence that this specific objective has been achieved.

## 3.2 LONG TERM DEVELOPMENT OBJECTIVE: IMPROVED QUALITY OF EDUCATION IN TEACHERS COLLEGES AND SCHOOLS

Tutors who had developed expertise in ICT in teaching and learning were expected to pass on these skills to student-teachers who in turn will use these skills in their teaching after graduating from the colleges. The process of using ICT at teachers' colleges has started and it will expand as tutors have seen the benefit of using ICT in their teaching. Most tutors, during discussion, agreed that ICT improved their lessons and students found it interesting. The next level, use of ICT in schools will require the government to take the next step, to roll out ICT at secondary school level, which requires adequate infrastructure as well as in-service teacher training.

There are, however, some tutors from selected teachers' colleges who have been involved in the training and supporting secondary school teachers on ICT use in teaching and learning through different projects. This has to some limited extent contributed to the long term development objective on supporting schools and colleges.

The importance of rolling out ICT in secondary and primary education was noted by the steering committee of the ICT implementation in teachers' colleges. The committee noted:

> *"... that it is important to progress with plans to integrate ICT in primary and secondary education to link with developments in teacher education so that ICT literate teachers from colleges are posted to practice ICT skills in schools to avoid relapse to ICT illiteracy. Available documents for integrating ICT in secondary and primary schools were to be shared among stakeholders for promoting awareness".*

However, even five years after the committee meeting, this has not happened especially at the secondary school level. There is a curriculum for ICT at secondary schools but not many schools are implementing it. Several problems pertaining to infrastructure will need to be addressed if ICT is to be rolled out in secondary schools.

First and foremost is the problem of electricity. Only 1107 (24.4%) of the 4528 secondary schools are connected to the national grid. A further 1039 (22.9%) schools have solar power and 1227 (27.1%) have generators. Given the financial constraints

of most schools, it is highly unlikely that the generators are operating full time. Computers to operate need regular supply of electricity.

The second problem that schools face is lack of computers. For a secondary school population of 1,884,272 students, there are only 9,438 functioning computers available for teaching purposes – one computer for every 200 students. Even if access to computers was restricted to teachers, there would be 7 teachers to each computer. Computers are unequally distributed. Three regions of Arusha, Dar es Salaam and Kilimanjaro have nearly half the computers in schools leaving the other half to be shared between the 18 other regions. Number of computers will have to be significantly increased if use of ICT for teaching and learning at secondary school level is to be significantly improved.

The third and perhaps the most significant problem is the high cost of internet access. The MoEVT is responsible for payments and has had problems paying for Internet access for 11 colleges connected through TTCL. Meanwhile, VSAT access, which is still used for most colleges, is very costly, especially when measured in terms of bandwidth and reliability of service. Satellite services could still be an option if MoEVT procure for a high number (several hundreds) of schools. A study[11] arrived at 10% of the cost for each installation (school) if you procure for 1000 schools. Schools close to already installed optical fibre networks should use that.

To roll out ICT learning in secondary schools will require significant increases in resources allocated to secondary level. The most ambitious programme for ICT in the education sector is the Tanzania Beyond Tomorrow (TBT) project[12], with a total cost of USD 188 million over ten years. Currently, around 20% of the education sector budget goes to finance secondary education. Unless there is increased allocation to the education sector in general, any investments in ICT to secondary schools will mean taking away resources from other sub-sectors in education, which would translate into a loss of quality in education that Tanzania can ill afford.

Most of the teacher students interviewed, for example 8 of 15 students participating in the group discussion in Murutunguru, stated that they were ready and prepared to teach ICT at schools but schools were not ready for the purpose. The other students felt that they had not received adequate training to teach ICT in schools. Student-teachers argued that ICT should be one of the two teaching subjects that they have to

[11] ICTanzania – Connecting the rural Tanzania. Prepared by Trydhed Consulting 2005-10-28

[12] Tanzania Beyond Tomorrow. e-Education Development Programme (2013/14 – 2023/24). MoEVT September 2013.

take and only student-teachers who were interested in the subject should be required to study the subject. There was no data available on how student-teachers performed in their ICT examinations.

Student-teachers taking diploma courses took two ICT courses, the Information and Technology (ICT) syllabus and the Information and Computer Studies (ICS) syllabus, which prepared them to teach ICT when they graduated. Student-teachers stated during discussion that secondary schools were not ready for ICT teaching as most lacked computers, electricity and internet connection. They were worried that the knowledge and skills gained will not be put to use. However there were also student-teachers who were so enthusiastic about ICT that they stated that they will encourage school authorities to buy the equipment necessary to teach ICT.

**Conclusion**

Since currently there is a syllabus for teaching of ICT in schools but no teachers and necessary infrastructure to teach the subject, there needs to be two syllabi so that ICT like other subjects becomes one of the two teaching subjects taken by student-teachers with prerequisite qualifications as an option in preparation to teach the subject in secondary schools while all other students take ICT as a cross cutting subject to benefit from ICT use in teaching and learning

The long term objective was partially achieved, but few computers in relation to the number of students at Teachers' Colleges as well as unreliable internet connection and power supply hinder the use of ICT in teacher education, and as a consequence the preparation of student-teachers to teach ICT and use ICT in their teaching in schools.

# 4 Relevance

## 4.1 RELEVANCE IN RELATION TO TANZANIAN AND SIDA POLICIES AND STRATEGIES FOR DEVELOPMENT

The preparation of the new national Vision started in 1994 and the Government finally launched the Tanzania Development Vision 2025 in 1999. The aim of Vision 2025 is that by 2025 Tanzania should have gone through an unprecedented economic transformation and development to achieve middle income status; characterised by high levels of industrialisation, competitiveness, quality of livelihoods, rule of law; and having in place an educated and pro-learning society. Specifically, the Tanzania Development Vision 2025 outlined the country's social, economic and political aspirations for the first quarter of the 21st century; with an underlying drive to reaching the middle income country status, with a per capita income of USD 3,000 (in nominal terms) by year 2025.

The Tanzania Vision 2025, guides all the subsequent national policies and practices, including those in the education sector. The Vision explicitly includes ICT by noting 'The new opportunities that ICT is opening up can be harnessed to meet the goals of the Vision' (p. 21). This key national development vision, recognises the role of education as a strategic change agent for transformation of the economy to a knowledge economy, and identifies the potential of ICT to address most of the development challenges including those presented by education.

In line with the Vision 2025, the government developed The National ICT Policy of 2003 recognising that ICT has a key role to play in national development. In order to achieve national development Tanzania launched The Tanzania Five year Development Plan (FYDP) 2011/12 to 2015/16, whose thrust was to unleash the development potential of the nation. ICT was seen as crucial in this aspect. During the plan period 1,506,900 million shillings will be spent to enhance use of ICT by providing high speed internet for public and private use. Internet connection would also be made available to neighbouring countries and for regional and international business. FYDP 2011/12-2016 also aims to create a critical mass of ICT skilled labour force by supporting specialised ICT institutions to ensure that there is an ICT skilled labour for all the sectors of the economy such as agriculture, manufacturing, mining, construction, communication, transport and financial.

In the implementation of ICT initiative, the availability of both mobile and non-mobile technologies should be considered. These will help in technology use and integration (with mobile ones, like laptops, mobile phones, tablets, projectors) especial-

ly for teachers and skill development for students and student-teachers (with non-mobile ones in the Labs).

**Conclusion**
The introduction of ICT is consistent with the national goal of using ICT as an integral part of the national development and can contribute to solve the problem with lack of teaching material. However, the national ICT policy, formulated in 2003, need to be continuously revised to keep abreast with rapidly changing technology in the sector.

## 4.2 RELEVANCE IN RELATION TO THE NEEDS OF THE EDUCATION SECTOR UP TO 2014

The government of Tanzania has recognised the role that ICT will play in bringing Tanzania to a middle income level country by 2025. It recognises that a critical mass of labour, with the required ICT competencies, is required to achieve this goal.

The Education Sector Development Plan (ESDP) recognises the role of computer studies in fostering technological and scientific developments, with the education sector review reiterating the need to expand the use of ICT to improve on the quality of education.

Following the National ICT policy of 2003, several policy documents have been promulgated to strengthen the role of ICT in education. *Information and Communications Technology (ICT) Policy for Basic Education* was formulated in 2007. The aim of the policy was to integrate ICT to enhance access, equity, quality and relevance of basic education, while stimulating and improving teaching and lifelong learning. ICT will be used to increase the number and quality of teachers, through improved pre-service and in-service training and better provision of teaching and learning materials. The use of ICT is also expected to enhance the acquisition and use of knowledge and skills for all learners, including those with special needs. ICT use will improve the efficiency and effectiveness of the management and administration of education, at all levels. This policy is also expected to broaden the basis of education financing, while optimising the use of education resources, through partnerships and stakeholder participation.

MoEVT is clear that ICT can improve teaching and learning in schools. In 2011 MoEVT developed a project *Teaching and Learning of Sciences, Mathematics and English in Secondary Schools using ICT.* As the performance of students in sciences, maths and English has historically been poor, government expects that use of ICT will help in improving the learning in these three key areas of secondary school curriculum. Among other things, the project will provide 35 secondary schools with computer equipment and internet connectivity. In all, 350 science, maths and English

teachers in these 35 schools will be made computer literate and will be provided with skills to use ICT in teaching these subjects.

Overall, one sees a recognition by the MoEVT that ICT if used properly has a potential to change teaching and learning in primary and secondary schools. There is need to ensure that ICT project in teachers' college is not seen as an end in itself but is made an integral part of all other emerging projects in education such as the *Teaching and Learning of Sciences, Mathematics and English in Secondary Schools using ICT.*

**Conclusion**
Tanzanian education policies and plans are supportive of ICT in education. It is expected that student-teachers graduating from Teachers Colleges will provide the necessary momentum to the teaching ICT in primary and secondary schools. Currently there are syllabi for teaching of ICT in schools but no teachers and necessary infrastructure to teach the subject.

## 4.3 RELEVANCE IN RELATION TO TECHNOLOGICAL CHANGES AND INFRASTRUCTURE

The evaluation assessed whether the development of ICT in Teachers' Colleges up to 2014 has been relevant in relation to technological changes, infrastructure as well as capacity. Since ICT is a rapidly changing field it was particularly important to assess the relevance today, both in terms of hardware/software and technical competences.

At the time of the project, the technological set-up was relevant. The choice of thin clients and servers for computer labs was cost-efficient; the Solaris operating system was virus resistant and the Open Office software was free; the use of VSAT for Internet access was the only option available; and given the lack of ICT technicians in Tanzania, it made sense to train tutor technicians for technical maintenance.

Today the technological relevance of the project needs to be reconsidered, in terms of infrastructure as well as technical capacity. As the price of computers keeps dropping, thin clients are no longer as cost-efficient and the maintenance of servers has proven problematic, requiring considerable technical skills. The operating system differs from common standards, although the Open Office software is increasingly compatible with market alternatives. After the roll-out of the national fibre optic backbone, VSAT has become a costly and unreliable source of access. The Ministry has already connected 11 colleges through TTCL, with positive results, although the bandwidth is not always sufficient and payment routines have to be attended to. With the growth in demand for Internet access, colleges will need fast and reliable broadband access. Today there are more trained ICT technicians and they can be employed by the Ministry, as illustrated by the recruitment of 12 ICT staff in 2012.

**Conclusion:**
Although the project was technologically relevant at the time, today the technological relevance of the project needs to be reconsidered, in terms of infrastructure and cost-effectiveness as well as technical capacity to handle the equipment and installations.

## 4.4 GENDER RELEVANCE

As stated in the Inception report, the evaluation has analysed gender issues according to Sida's Manual for Gender mainstreaming. The project document does not mention gender issues. No gender analysis has been done for the project and the gender dimension is not analysed in relation to beneficiaries and stakeholders of the project. Gender has not been integrated and there are no targeted efforts to improve gender equality. The project document does not formulate any desired results related to gender equality.

The Assessment Memo by the Embassy of Sweden mentions that the management of colleges should ensure that 50% of the ICT tutors are women.

In the 13 visited colleges, there were very few females among the ICT tutors. Data from MoEVT about the ICT tutors in 19 Teachers' Colleges shows that currently 16% are female.

**Conclusion:**
The project did not benefit from a gender analysis. Gender equality has not been mainstreamed or targeted by the project; consequently gender issues have not been prominent in the implementation or afterwards.

# 5 Efficiency

## 5.1 STRENGTHS AND WEAKNESSES IN PROGRAMME MANAGEMENT AND STRATEGIC PLANNING

The project suffered from initial delays with the appointment of the project team taking about 7 months, and in the procurement, with computers being delivered at the end of 2006, one year after planned delivery. The delays were caused mainly by the difficulties for the project to comply with, or to take into account in the initial project planning, the government procedures for human resources management, budgeting and financial management, as well as some difficulties in procurement. This caused delays also in the development of training material and trainings.

Once appointed, the project team, together with MoEVT, seems to have overcome the difficulties and carried out the project. The extension of the project for another year made it possible to successfully deliver almost all of the outputs. During the time of the project, management and planning seem to have worked well, with steering committee meetings and review meetings taking place regularly. Reporting has been adequate and actions were taken to deal with problems occurring.

Planning for transferring the project to a programme within MoEVT started early, already in 2006. The need to continue training and secure the functioning of the ICT equipment was discussed and a Strategic plan was developed for the programme under MoEVT.

After the end of the project, most of the project staff were retained and a programme manager was appointed and posted in Morogoro Teachers' College. The MoEVT managed to have the program staff employed at the ministry with top-up of salaries to give the same level of salaries as under the project. Training continued and ICT equipment was maintained, although it became more difficult to handle the problems when external funding was no longer available.

From 2013, the programme has suffered from not having a dedicated program manager full time. Difficulties in repairing thin clients and providing internet connections have increased. Training has come to a halt, partly due to the fact that there are no incentives for payment of tutors for attending training outside of regular working hours.

Volunteers have been linked to the project and have been a great additional input to the implementation of the project. They have supported development of training ma-

terial and the training and in managing the ICT system. At the end of 2006, there were eleven volunteers, among them several experienced teachers who provided valuable assistance to the project.

**Conclusion:**
The project was efficiently managed and there was considerable commitment from MoEVT, contributing to overcoming the initial problems with delays in appointment of the project staff and with delays in procurement. From 2009, the programme under MoEVT was functioning well and training and functionality of the ICT equipment was maintained. From 2013, the programme is suffering from problems with internet connections, inability to continue the training and increasing difficulties in keeping the ICT equipment functioning. Today, a weakened management in combination with technical obsolesce of equipment and the looming end of life of it will trigger a rapid decline of the project if nothing is done to change it.

## 5.2 STRENGTHS AND WEAKNESSES IN RELATION TO EXTERNAL SERVICES

The evaluation assessed strengths and weaknesses in relation to the need, availability, affordability and potential of external services and the extent such technical and pedagogical services in support to the programme team and colleges have been utilised during program implementation and up to 2014.

During the project, *technical services* were difficult to obtain and the solution to train tutor technicians was one of the strengths of the project. These skills have, however, not proven sufficient in the long run and although the Ministry has recruited some ICT technicians (12 in 2012), more ICT staff are required. The Ministry should also develop closer collaboration with technical colleges, since in-house technical expertise, including strategic expertise, is insufficient.

Regarding *pedagogical services* during the project, very little was done for the pedagogical integration of ICT in teaching and learning. Some volunteers (VSO) assisted with this task, but the efforts were not sufficient or consistent. After the project ended, an effort was made to introduce Moodle, in collaboration with Open University of Tanzania (OUT) and the African Virtual University (AVU)/ICT College of the University of Dar es Salaam (UDSM). The results of this collaboration have been positive, illustrating that the Ministry should develop closer collaboration with educational institutes for pedagogical services.

**Conclusion**
In the absence of external technical services, the project developed in-house capacity, while making use of external expertise for pedagogical services. The Ministry would benefit greatly from strengthening collaboration with technical and educational institutes, not least for capacity development.

# 6 Impact

## 6.1 IMPACT IN TEACHERS' COLLEGES

The evaluation found that, although there were problems with electricity and internet connections, ICT is part of teaching and learning at the Teachers' Colleges. More and more tutors are using ICT in their teaching and some colleges have purchased additional projectors for the use of teachers. According to the survey of tutors conducted by the evaluation, 44% of the tutors who responded stated that they either totally agreed or agreed to be using ICT for teaching and learning purposes (see Chapter 3.1.1). Although this is lower than the target of the project of 80%, ICT is established as a tool for teaching and learning in Teachers' Colleges. A significant number of tutors have purchased laptops and modems to enable them to search the web and communicate.

Tutors also use internet for searching for information to be used in their teaching and to some extent for online learning and professional development (see Chapter 3.1.2 and 3.1.3) and for communication (see Chapter 3.1.4).

Lack of adequate number of computers at Teachers' Colleges and unreliable internet connections hinder the use of ICT in teacher education, and poses difficulties in the preparation of student-teachers to teach ICT and use ICT in their teaching in schools. This need to be addressed to ensure that skills and knowledge that students have gained is put a useful use.

According to the Completion report from the project in 2008, there was little evidence that ICT is used in Teachers' Colleges to collect and process information and for management. At the time of the evaluation, we found however that word processing and spread sheets are widely used. Reports are written using computers, the ministry requests information and sends tables to be filled out and spreadsheets are used in some colleges for student databases, staff data and college calendar.

One area where considerable impact could be seen was the use of internet for communication. The principals testified that they now use email for almost all communication with MoEVT, which is a significant improvement in timely communication.

**Conclusion**
Teachers' Colleges are using ICT in training and learning, although the colleges face challenges with adequate provision of electricity and slow internet connections.

## 6.2 IMPACT IN SCHOOLS

Most of the student-teachers stated that they were ready and prepared to teach ICT at schools but schools were not ready for the purpose, although there were some teacher students who felt that they had not received adequate training to teach ICT in schools (this is further analysed in chapter 3.2).

Nearly all the student-teachers stated during discussion that secondary schools were not ready for ICT teaching as most lacked computers, electricity and internet connection. They were worried that the knowledge and skills gained will not be put to use. However some student-teachers were so enthusiastic about ICT that they stated they will encourage school authorities to buy the equipment necessary for them to use ICT in teaching.

**Conclusion**
To be able to see an impact at school level, the government will have to take the next step, to roll out the ICT at secondary school levels.

# 7 Sustainability

Since this evaluation is done 5 years after the project ended, this has been an opportunity to particularly assess the sustainability of results from the project. There are several questions about sustainability in the Terms of reference and in the following section, we respond to each of them.

*1. The level to which the project has effectively been mainstreamed to a government program at Ministry, department and Teachers' College levels;*

When the project ended it was taken over by the MoEVT as a programme within the Teacher Education Department. The project coordinator continued working with the project and was relocated to Morogoro. Other project staff at Morogoro Teachers' College were maintained with the same responsibilities as under the project, responsible for technical support and maintenance. About 500 million shillings were budgeted each year for internet fees, training and other programme costs.

From 2013, when the project coordinator retired, a gradual decline of the functioning of the ICT programme was observed. No new coordinator was nominated. The in-house training came to a halt in 2012 when the ministry could no longer pay incentives for training after working hours at Teachers' Colleges. Payment of the internet providers became irregular and for periods, the connections were terminated by the providers. Increasing demand for repair of equipment put pressure on the ICT technicians at Morogoro and the number of non-functioning thin clients increased. New servers were procured in late 2013 but have not yet been installed due to the complicated procedures of installing updated versions of the operating system. The servers were still at Morogoro at the time of the evaluation.

*2. The extent to which Teachers' Colleges take advantage of ICT for management and communication purposes, e.g. how officials, principals, tutors and students in the Teacher Education Department, colleges, administrative positions/subject departments are utilising the opportunities available through ICT;*

ICT is not widely used for management processes, although some colleges are using Excel for student databases, staff data and college calendar. There are no concerted efforts from the MoEVT to introduce management systems based on ICT. The evaluation found however that word processing and spread sheets are widely used. Reports are written using computers, the ministry requests information and sends tables to be filled in.

There has been a tremendous increase in communication via internet and the introduction of ICT has greatly facilitated communication between the colleges and MoEVT and among the colleges.

During the project, only the principals participated in the management training. This may be an explanation to the slow pace of introducing ICT for management processes in Teachers' Colleges.

*3. The extent to which the identified risk of losing ICT persons to others paying higher salaries and whether the retention plan for pedagogical and technical staff is sufficiently solid to sustain the programme;*

Few Teachers' Colleges have lost persons that were trained in ICT. Of the 12 colleges visited, most had not lost any trained tutors. Four of the colleges had lost one and one college (Kleruu) had lost 5 of the ICT trained tutors to other colleges, or through promotion or retirement. With the exception of Kleruu, it seems that the risk of losing ICT trained tutors has not materialised. With more specialised ICT technicians being trained in Tanzania, the risk of losing the ICT trained tutors has diminished.

There is one incentive in place for ICT tutors. They get an extra payment of 8,000 shillings per day for supervising the ICT laboratory, although this does not seem to be the main reason for tutors to remain. Instead they mentioned the advantage of being employed by the government and not wanting to risk that as the main factor that made them stay in the education sector.

*4. In what ways are teacher students prepared to become change agents and the schools (school management, fellow teachers, etc.) are prepared to accommodate their arrival and role;*

As explained in Chapter 3.2, Most of the student-teachers stated that they were ready and prepared to teach ICT at schools but schools were not ready mainly because there were no computers or other ICT equipment.

*5. The need, availability and affordability of ICT equipment and internet connectivity*

At the time of the evaluation, the situation from the field and at the ministry indicated that most of the equipment and software are still functioning. In the case of the Sun computers (thin clients) which are the major component both in terms of volume and cost, about 1201 out of 1293 were functioning well according to the ICT equipment report, which is 93%. In the updated inventory of equipment statistics from the visited 12 colleges during this evaluation (Annex 3) we found that 90% of them are functioning.

As for the internet connectivity, it has become irregular and the speed is not adequate for the level of use that is now needed.

*6. Whether standards of Management services, Computer Systems, Power systems and ICT environment have been maintained at the end of the project and sustained over the following three years in the programme with regard to activities, maintenance, repair, replacement and disposal of ICT equipment;*

The ICT system introduced by the project is largely functioning well. There are problems with frequent power failures and slow internet connections. The organisation for maintenance and repair of ICT equipment is presently not sufficient and needs to be strengthened. Disposal mechanisms for ICT facilities which are obsolete/not functioning/outdated seem not to be in place in the visited colleges. If not properly disposed of, there may be negative environmental effects.

*7. The need, availability, affordability and potential of external services and the extent such technical and pedagogical services in support to the programme team and colleges have been utilised;*

As described in Chapter 5.2, *technical services* were difficult to obtain during the project and the solution to train tutor technicians was one of the strengths of the project. The programme still relies on in-house skills for technical services, provided by the tutor ICT technicians with support from the ICT unit at Morogoro Teachers' College. None of the colleges visited mentioned any local resources available for technical service.

Regarding *pedagogical services,* an effort was made to introduce Moodle, in collaboration with University of Dar es Salaam (UDSM) and the African Virtual University (AVU)/ICT College. The results of this collaboration have been positive, illustrating that the Ministry should develop closer collaboration with educational institutes for pedagogical services.

# 8 Conclusions and Recommendations

## 8.1 RECOMMENDATIONS TO MOEVT

***Achievements of the objectives***

The evaluation found that five outputs out of six were achieved at the end of the project. The output about basic ICT training was not fully achieved since the project did not manage to train all tutors.

Three of the four specific objectives were achieved while the objective of using ICT for teaching and learning was partially achieved. The survey showed that 44% of tutors reported that they use ICT for teaching and learning while the indicator was 80%. Meanwhile, 62% of the tutors were using the Internet for sharing knowledge, which was much higher than the targeted 20%.

The long term objective was partially achieved, but lack of adequate number of computers at Teachers' Colleges and unreliable internet connections is an obstacle for the preparation of student-teachers to teach ICT and use ICT in their teaching.

The overall goal of the project was to produce student teachers with knowledge and skills in the use of ICT for teaching and learning. These student teachers were expected to use these skills in improving quality of secondary and primary education. This still needs to be addressed to ensure that skills and knowledge that students have gained is put to gainful use use. Teachers' colleges have been training graduates with knowledge and skills in ICT since 2005, but their skills are not put to use in schools where they are posted. To have an impact on the quality of teaching and learning in secondary and primary schools the required infrastructure needs to be put in place.

*Recommendation:*

- As an initial phase ICT should be rolled out in secondary schools by establishing a computer laboratory in each school and provide internet connection for the laboratory.

***Project and programme management***

The project was efficiently managed and there was considerable commitment from MoEVT, contributing to overcoming the initial problems with delays in appointment of the project staff and with delays in procurement. From 2009, the programme under MoEVT was functioning well and training and functionality of the ICT equipment was maintained. Since 2013, the programme has suffered from problems with internet connections, inability to continue the retraining and increasing difficulties in keeping the ICT equipment functioning.

*Recommendations:*

- ICT in teacher education needs to be re-prioritised so that sufficient financial and human resources are allocated for the programme.
- MoEVT should strengthen collaboration with Ministry of Communication Science and Technology (MCST) for backup and support on technical issues relating to connectivity and ICT equipment and facilities.
- Department of Teacher Education in MoEVT should prepare a Strategic Plan for moving forward with ICT integration in Teachers Colleges, with involvement of stakeholders.
- A program coordinator should be appointed for the ICT in Teachers' Colleges programme.
- The format for inspection of Teachers' Colleges should be revised to properly include the assessment of use of ICT in teaching.

***ICT equipment and software***

More than 90% of hardware and software purchased and installed in all Teachers' Colleges are still working, though some have broken over time. This has left some colleges with fewer computers than needed. The purchased and installed equipment and software has been useful. After project completion, additional hardware and software have been purchased by MoEVT, the colleges themselves and in some cases individuals' tutors and students' tutors. While the selected hardware and software were considered to be ideal for such education institutions there are concerns about technical support capability, perceived ease of use, alignment with hardware/software used by the majority in services and industry and slow internet connections. Meanwhile, irregular power supply continues to pose problems for the use and maintenance of ICT equipment.

*Recommendations:*

- In the near future, the ICT equipment needs to be replaced. The Sun thin clients will come to the end of their life span and need to be replaced. The MoEVT should prepare for the replacement. A thorough calculation should be made of the future alternatives taking into consideration all aspects of use, maintenance and costs that are total cost of ownership (TCO).
- The functioning of the ICT laboratories needs to be reviewed to maximise the use of both tutors and students, taking into consideration that tutors need separate laboratory facilities.
- There is a need for all tutors to have a personal laptop and/or other mobile technologies, either through the ICT programme or through subsidies for buying their own.
- Every classroom in the Teachers' Colleges should be equipped with projector and internet access.
- All colleges need to have more reliable power supply from the national grid, and back-up systems to counter fluctuations.

***Internet connection***

Teachers' Colleges are using ICT in training and learning, although the colleges face challenges with adequate provision of electricity and slow internet connections. The evaluation found severe problems with slow or very slow internet connections in all visited Teachers' Colleges. The original set-up with satellite connections should be revised. The preferred connection is now fibre cable.

*Recommendation:*

- Exploit the opportunities to improve connectivity in Tanzania and re-think how to provide internet connection to Teachers' Colleges with broadband access at reasonable costs.

***ICT training and training in using ICT for teaching and learning***

The project did not manage to train all of the tutors in basic ICT and the training of trainers system does not seem to be sufficient for the training in using ICT for teaching and learning. Presently there is no training due to lack of incentives for training outside working hours.

Most of the tutors and management staff of the colleges agreed that the training was well conducted but argued that not enough tutors benefited from the training and the duration of the training was too short – not adequate for many tutors to enable them to apply the ICT knowledge to teaching.

*Recommendations:*

- Training should be resumed and strengthened. More training is needed for those who have not received training together with refresher and on-going training (basic ICT training, technical training and training in the use for teaching and learning). In-service training could be used for most of this training.
- One option for content development is to use thematic peer networks – as a Wiki school content.
- The teaching of ICT should be revised focusing more on the use of ICT and less on the technical/theoretical parts of ICT systems.
- Partnerships should be developed with relevant agencies, like Tanzanian Libraries, Technical colleges, University Faculties.
- Provide support to tutors and students who are committed and motivated to use ICT and enhance ICT integration in Teacher Education through agreed approaches at college level.
- Establish and support panels of subject specialist tutors especially for Mathematics and Science so that tutors can prepare authentic study material resources and share within and between colleges using ICT.
- Graduating student-teachers with good performance in ICT should be posted in schools identified to be potentially equipped to host ICT subject so that they are able to practice.

***Maintenance and service***
Almost all of the trained tutor/technicians are still working at Teachers' Colleges, but some have moved to other colleges. This has left some remote and rural Teachers' Colleges with less tutor technicians.

*Recommendations:*

- Support structure should be strengthened and decentralised to include also zonal technicians and college technicians.
- Technicians with diploma level should be recruited for support and maintenance.
- Utilise provision for agreement through Regulatory Legislature with suppliers and manufacturers for technical support after warranty periods.
- Tutors be supported to build subject based digital content, through web browsing and research. The content may be modified/changed to fit the national curricula requirements. The digital content could be shared among the tutors in teachers' colleges. Tutors should be encouraged to use and improve the content and use it in their teaching.

## 8.2 RECOMMENDATIONS TO SIDA

There are two areas where there is currently a need to advance with ITC in education.

*ICT in schools*
a) The ICT project did not have a measurable impact on increasing the quality of learning at the level of primary and secondary schools. One main conclusion from the evaluation is that to have an impact in schools, considerable investments will be needed in ICT infrastructure in schools (computers, Internet, power supply), along with in-service teacher training and content development.

- Hardly anything is known about how the student teachers graduating from teachers' colleges are using their ICT knowledge and skills in teaching ICT in schools and using it in their own teaching. A tracer study of the student teachers will shed light on the usefulness of the project.
- The ICT project did not have a measurable impact in increasing the quality of learning at the level of primary and secondary schools. The shortage of both teachers and textbooks hampers the learning in schools. One main conclusion from the evaluation is that the number of computers will have to be significantly increased if quality of teaching and learning, primarily at secondary school level, is to be improved.
- Sweden/Sida could assist with the roll-out of ICT in secondary schools.

*ICT in teaching mathematics and science*
b) The other area is the problem with lack of teacher in mathematics and science. There is currently an estimated lack of 26 000 teachers in these subjects, and with current teacher education, it will take at least 15 years to fill the gap. The MoEVT has

raised the issue on how to cope with this situation and how ICT in teaching could be used to assist in solving the problem. It is evident that a wider use of ICT for teaching could fill the teacher gap, e.g. using the best teachers to develop and deliver online lectures that could be transmitted to a number of schools, either at the national level or at the level of educational zones or individual schools.

- Tanzania currently faces a severe shortage of teachers in mathematics and science. There is an estimated lack of 26,000 teachers in these subjects, and with current teacher education, it will take at least 15 years to fill the gap. It is evident that a wider use of ICT for teaching and using the best teachers to develop online lectures that could be transmitted to a number of schools is one way. Another option that can be considered is to mass produce DVDs on various topics in maths and science and distributed to all the secondary schools in the country. There are many ways in which the shortages of teachers can be addressed.
- Sweden/Sida could support programmes which aim using ICT for teaching mathematics and science.

Basic ICT training for secondary school teachers in Iringa (Photo: Paula Uimonen)

# Annex 1 – Terms of Reference

**TERMS OF REFERENCE**

**Short-term consultancy to evaluate ICT in Teachers Training Colleges Project (Contribution 32000017).**

## 1. Introduction

This evaluation is an end of project evaluation to gauge in how far the original objectives of the project have been met. It will be used to allow both the implementing partner, MoEVT, and the financing agency, Sida, to obtain a current overview of the state of the project and what can be done to improve its performance. The evaluation should be as candid as possible, offer constructive recommendations where required but should not shy to warn of risks where required.

The evaluation should also feed information into the current country strategy operationalization process for Tanzania at the Embassy and Sida Headquarters. E-Learning is an integral part of that process and the evaluation of a major ICT project in the past is important.

## 2. Background

The context for implementation of ICT in Teachers Colleges emanates from the country policy documents. The Tanzania Development Vision 2025 explicitly includes ICT by noting 'The new opportunities that ICT is opening up can be harnessed to meet the goals of the Vision' (p. 21). The National Information and Communications Technologies Policy (March 2003) and The ICT Policy for Basic Education (2007) stress on the utilization of ICTs in primary and secondary education. In the most recent National Strategy for Growth and Reduction of Poverty (NSGRP), 'a key priority will be to make sure that well-trained and motivated teachers are equitably deployed and adequately supported to perform effectively.' The Education and Training Policy (ETP, 1995) recognises the role of computer studies in fostering technological and scientific development by stating that in school curriculum, emphasis will be on the teaching of science and technological subjects including computer studies (p. 52). Both the primary and secondary education systems in Tanzania are going through major reforms that can benefit from the use of

ICT. Primary Education Development Plan (PEDP) aims at offering Universal Primary Education for all children at the age of 7 – 13 years resulting in the implementation of Secondary Education Development Plan (Phase I and Phase II).

## 3. Project Overview

Successful implementation of country policies for improving access has given rise to a dramatic increase in the demand for teachers putting a great pressure on the teachers colleges to train the required number of qualified teachers and maintain standards. The use of ICTs and distance education has been identified as strategies for improved access and quality improvement.

Recommendations from a feasibility study and a stakeholder's workshop in 2005, revealed challenges relating to improvement of access and quality in Teachers Education that could be dealt with through ICT.

- First was the professional isolation of teachers that could be minimized by using the Internet connectivity to provide support through local and global collaboration to enhance the learning outcomes for students and professional development opportunities for teachers.
- Secondly was the unavailability of reliable basic education data collection approaches in colleges so that the use if ICTs for analysing education data could be effective in providing analytical data required for planning, management and teaching purposes.
- Thirdly prevailing shortage of instructional materials and research findings could be tackled by having Internet connectivity in teachers colleges and schools to enable teachers' access relevant materials that enhance learning outcomes of their students.
- Fourthly was the inability to use multimedia in teaching and learning and miss the great potential for stimulating interest among the learners especially in subjects like Science and Mathematics.

From 2005 to 2008 the Ministry of Education and Vocational Training (MOEVT) in Tanzania secured funding of USD 3,733,000.00 from the Government of Sweden through Sida to implement a project on ICT in Government Teachers Colleges. All 34 Teachers Colleges were provided with up to date ICT equipment and broadband Internet connection. Primary beneficiaries to this initiative were 900 tutors and 51,700 student-teachers. The Ministry dedicated to promote ICT in the education sector and earmarked Teacher Education as the starting point in the endeavour to introduce ICT.

The government of Tanzania set aside annual funding of Tsh. 500,000,000.00 for purpose of sustaining the initiative-. In this context, teacher education workforce gain the capacity to integrate ICT as a teaching and learning tool in Teacher Education resulting in ICT skilled teachers in schools. Tutor technicians trained in hardware/software installation and preventative maintenance while the rest of college tutors learnt ICT Basic skills using the ICDL programme followed by training on the use of ICT in teaching and learning. The college management team enhanced their competencies required to use ICT as a tool for management, administration, teaching and learning in their colleges.

## 4. Objectives of the Project

### 4.1 Long Term Development Objective

The developmental objective of the on-going programme is to improve the quality of education in Teachers Colleges and Schools by integrating ICT in Teacher Education in order to make all student-teachers ICT literate on completing their course. Also to benefit from ICT use as a teaching and learning tool as well as for management purposes. Teachers in general will be more qualified, computer literate and in a better position to share knowledge with their peers and to access a wide variety of teaching materials via the Internet. Teachers and practitioners with competencies required to use ICT as a tool in enhancing the teaching and learning process.

### 4.2 Short Term Specific Objectives

The stages towards attaining the long term Development Objective are reflected in the short term specific objectives as follows:

- Established workforce of highly trained tutors with appropriate skills and attitudes to apply ICT in enhancing teaching and learning;
- Improved teaching capacity through teachers use of Internet for accessing and sharing knowledge and experiences;
- Increased opportunities for professional development through online learning and distance education; and
- Improved transfer of information among Colleges of MoEVT

## 5. Duration and Schedule for Evaluation

The evaluation will start after signing the contract in the second week of January 2014 and be completed and report submitted in the first week of March 2014. The timetable will be planned in consultation with the department of Teacher Education by accommodating the college calendar

to be sure that colleges are not on vacation and hence tutors and students will be available.

## 6. Stakeholder Involvement

It is of high importance at different stages of the evaluation to involve:

- Department of Teacher Education
- The Project Steering Committee
- Sida
- Program team
- Tutors
- Student-teachers
- Former Student-teachers
- Internet Service Providers
- Computer Systems-Solaris FOSS (Hardware and software) Support Providers.

The evaluation should assess every stakeholder on the perception of their expected role. It should focus how well they currently perform in that role and what can be done to maintain good results and improve on less successful efforts.

## 7. Objectives of the Evaluation

- The overall objective of the evaluation assignment is to find out what actually has been achieved and which lessons have been learned during the programme implementation so far and establish what can be improved in the continued implementation of the initiative. This evaluation should focus on the level of **outputs** and **outcomes** while considering the long term **impact** to be observed after a longer period. The evaluation assignment needs to take into account Sida Evaluation Manual and the OECD Evaluation Criteria standards (Evaluating Development Co-operation, summary of key norms and standards) focusing on the following aspects of the programme:Relevance
- Effectiveness
- Efficiency
- Impact
- Sustainability
- Possible future ICT collaboration

The evaluation has to allocate part of the report towards the potential of ICTs in solving pervasive problems in education. The Embassy in Dar es Salaam has been tasked to consider e-Learning in the Country Strategy for 2013 to 2019. To do so it needs to draw lessons from this former contribution.

Specifically, the consultant has to concentrate on what has happened at the Teachers Colleges in the areas of Human Resources, ICT institutional policy, ICT in curriculum and assessment and e-learning, its potential to address education deficits in Tanzania, ICT use in tutor and graduate students pedagogical practice, ICT in Management and administration, ICT in formal and informal professional development, ICT infrastructure and computer systems; (hardware and software), Internet connectivity, buildings and furniture and electricity power, by a assessing:

i. the level to which the project has effectively been mainstreamed to a government program at Ministry, department and teachers' college levels;

ii. capacity and procedures regarding important issues relating to the management of the programme itself;

iii. the extent to which Teachers Colleges take advantage of ICT for management and communication purposes, e.g. how officials, principals, tutors and students in the Teacher Education Department, colleges, administrative positions/subject departments are utilizing the opportunities available through ICT;

iv. achievement of project objectives as specified in the original project document;

v. the extent of ICT tutors' and tutor technicians' acquisition of ICT skills in relation to their role of improving teaching and learning;

vi. the level of competence in ICT reached by officials, principals and tutors in Teacher Education Department, Programme Team and colleges;

vii. the extent to which the identified risk of losing ICT persons to others paying higher salaries;

viii. whether the retention plan for pedagogical and technical staff is sufficiently solid to sustain the programme;

ix. the extent to which tutors use ICT as a tool for teaching and learning and establish percentage of tutors applying ICT skills in teaching subjects of specialisation;

x. to what extent ICTs play a role in tutors professional development activities and find out the percentage of the trained work force that utilizes those skills;

xi. the extent to which student-teachers have been trained to attain basic ICT literacy and what level of competence they have achieved;

xii. in what ways teacher students are prepared to become change agents and the schools (school management, fellow teachers, etc.) are prepared to accommodate their arrival and role;

xiii. how the outcomes of the programme can help support e-Learning initiatives in teacher training and the class room setting;

xiv. utilization of the acquired infrastructure for management, teaching and learning purposes

xv. whether standards of Management services, Computer Systems, Power systems and ICT environment have been maintained at the end of the project and sustained over the following three years in the programme with regard to activities, maintenance, repair, replacement and disposal of ICT equipment;

xvi. the need, availability, affordability and potential of external services and the extent such technical and pedagogical services in support to the programme team and colleges have been utilized;

xvii. the need, availability and affordability of ICT equipment and internet connectivity

## 8. Recommendations and Lessons

The consultants will be expected to assist both the Ministry of Education and Vocational Training and Sida in identifying strengths and weaknesses in:

i. Programme management, strategic planning;

ii. ICT procedures, maintenance routines and keeping of standards;

iii. Salary structures compared to the current labour market;

iv. Sustainability model of the project including technical sustainability and retention of pedagogical and technical trained staff;

v. Effectiveness of the programme in teaching and learning and preparation of graduating teachers;

vi. Readiness of graduated teacher students, their opportunities and extent of real world use of ICT as well as recipient schools being prepared and able to accommodate teaching methodologies, planning and execution of programme objectives;

vii. Inform the Embassy's operationalization process of its country strategy in regards to whether the outcomes of the programme can be utilized strategically for future collaboration in e-learning;

viii. Efficient procedures for the implementation of the programme

ix. Keeping up high motivation of employed programme staff.

## 9. Methodology

### 9.1 Evaluation methodology

The evaluation process will comprise the following three broad phases.

- Inception – includes creation and approval of a detailed evaluation work-plan;
- Data collection and field visits – encompasses both document review and field visits. Classroom observations will be one important method used particularly with regards to analysingto conduct the consultancy. This methodology should reflect on the change in classroom practices and;
- Analysis and reporting – incorporates presentation of findings, delivery of a draft, capturing of feedback and production of final written report.

### 9.2 Specific activities the evaluators will need to undertake

1. Working in Collaboration with Ministry of Education and Vocational Training and Sida that oversees the process and progress of the evaluation undertaking.
2. Developing a detailed evaluation plan which will include methodologies to be used. This methodology should reflect on the Guidelines for Using ICT in Teachers Colleges.
3. Reviewing ICT Project document.
4. Training of a team of data collectors who will support the evaluators in gaining information and insight from the field.
5. Organising a participatory workshop with key education stakeholders to present key evaluation findings and recommendations.
6. Inspect available Swedish Country Strategy documentation and conduct interviews with embassy staff concerned on how, if at all, ICT and e-learning could be combined with the outcomes of the programme for future collaboration.

## 10. Work Plan and Schedule

The consultant should visit Morogoro as the lead institution, at least 12 other sites, three of which should be remote (rural) and very remote (off grid). The consultant should estimate and propose the amount of man-hours and time table for the entire consultancy. The consultancy should be concluded by March 2014. The consultant is estimated to spend 25% on the inception phase, 60% of the time on field work and data collection, and 15% on analysis and reporting.

## 11. Reporting and Deliverables

A comprehensive Evaluation report documenting findings according to consultancy objectives is to be presented after completion of the task. The Consultant will be guided by the OECD DAC Network Norms and standards and the terminology therein and adhere to the evaluation report formats described in the Sida Evaluation Manual.

An inception meeting will kick off the assignment, a week upon which an inception report will be delivered and reviewed by an Evaluation Management Group.

The Management Group will review progress reports from the consultant before receiving a draft of the final report. The consultant will have 20 days to deliver the final report after receiving comments from the Management Group.

The Consultant will be expected to participate in one follow up workshop to disseminate the findings of the evaluation to stakeholders.

## 12. Expected Deliverables and Timeframe

| Deliverable | Timeframe |
|---|---|
| 1. An inception report which should include<br>a. A detailed evaluation work plan<br>b. Literature review<br>c. Evaluation questions<br>d. Sample of instruments for the evaluation<br>e. Identification of key informants<br>f. Data collection methods including; data interviews, questionnaires, field visits, and so on. | |
| 2. Draft report which includes:<br>a. An Executive Summary | |

| Deliverable | Timeframe |
|---|---|
| b. Detail of evaluation programme<br>c. Scope of the evaluation<br>d. Evaluation methodology and guiding principles<br>e. Findings<br>f. Suggestions for possible intervention(s) | |
| 3. A dissemination workshop to harmonize and leverage the report | |
| 4. Final evaluation report<br>A comprehensive report (both electronic and hard copy- MS WORD) on ICT evaluation in Teachers Colleges covering the current status, level of achievement of the set objectives, challenges and recommendations. | |

## 13. Contract Management

Teacher Education Department will be responsible for the day-to-day management of this contract. The evaluator will present the deliverables to the Director of Teacher Education Department at the MoEVT.

Sida and the MoEVT expect the evaluators to lead this work but will support the consultant by:

a) ensuring that all relevant contacts and information are available;
b) making available key documentation;
c) facilitating field visits;
d) providing office space for meetings;
e) facilitating the organisation of the consultation stakeholder feedback workshop; and
f) performing other technical and administrative duties as required.

Sida and MoEVT will not provide office space to the evaluator.

## 14. Required Qualifications of Evaluation Team

Local personnel participation in the execution of the Evaluation is encouraged to enhance expertise and capacity building. Evaluating consultant/s will be required to show proof of:

- Experience from previous evaluation work in similar contexts.

- A strong background in pedagogy, good expertise in ICTs application in Education and a good understanding of Project/Organizational Management.
- Preferably a team with complementary competencies in the mentioned areas of specialization as most suited.

**15. Evaluation criteria and experience**

The consultancy service should be undertaken by an individual professional or a team responsible for managing the entire work. The evaluator should be a national or international consultant. The evaluator will have the overall responsibility for the timely and quality submissions of all the evaluation deliverables. All reports, briefing and presentations will be in English and shall be properly edited and presented to allow for direct publication upon reception.

# Annex 2 - Results from survey to 12 colleges February 24-28 2014

*Table 2: Results from survey to tutors at the 12 Teachers Colleges visited*

| | ***Results as per questionnaire (%)*** | | | | | |
|---|---|---|---|---|---|---|
| | 5 | 4 | 3 | 2 | 1 | |
| **Survey questions:** | I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree | Total number respon-ding |
| I have been sufficiently trained in basic ICT skills/knowledge | 16 | 39 | 11 | 21 | 13 | 224 |
| I have been sufficiently trained in how to use ICT in my teaching | 13 | 35 | 16 | 23 | 13 | 223 |
| The ICT equipment in this Teachers College are functioning well | 3 | 19 | 25 | 38 | 15 | 224 |
| The software in this Teachers Col-lege is functioning well | 1 | 27 | 24 | 34 | 14 | 224 |
| The Internet connection in this Teachers College is functioning well | 1 | 22 | 17 | 31 | 29 | 230 |
| The internet connection in this Teachers College is sufficient for teaching and learning purposes | 4 | 17 | 17 | 35 | 26 | 223 |
| I am using ICT in my teaching and learning | 13 | 31 | 13 | 24 | 19 | 223 |
| I am using internet for accessing and sharing of knowledge and experi-ence | 22 | 40 | 13 | 15 | 11 | 224 |
| I am using internet for my profes-sional development through online learning, blended learning or dis-tance education | 16 | 29 | 12 | 25 | 17 | 225 |

# Annex 3 – ICT equipment report

**ORIGINAL DATA - 07th NOVEMBER, 2012 BY; JOYCE M. BARAVUGA**

**UPDATED FEBRUARY 2014 DURING PROJECT EVALUATION**

| COLLEGE | SUN RAY 270 | | X2200 Server | | KVM Switch | | Optical Drive | | 3000VA UPS | | 34U Cab. | | 12U Cab. | | Printer P3005 | | W/Board | | V/Stablelizer | | HP Desktop | | Projector | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Broken | Total | Broken | Total | Broken | Total | Broken | Total | Broken | Total | Broken | Total | Broken | Total | Broken | Total | Broken | Total | Broken | Total | Broken | Total | Broken |
| Vikindu | 17 | 2 | 2 | 1 | 1 | | 1 | | 2 | 1 | 1 | | | | 1 | 1 | 2 | | 1 | | | | 1 | 1 |
| Klerruu | 72 | 3 | 3 | | 1 | | 1 | | 2 | outdated | | | | | 1 | 1 | 2 | | 1 | 1 | 11 | 6 | 1 | outd |
| Tandala | 18 | 5 | 1 | | 1 | | 1 | | | | 1 | | | | 1 | 1 | 2 | | 2 | | | | 1 | |
| Kinampanda | 21 | 1 | 1 | | 1 | | 1 | | 2 | | 1 | | | | 6 | | 2 | | 1 | | 2 | | 2 | |
| Mtwara (K) | 60 | 1 | 1 | 1 | 1 | | 1 | | 3 | 0 | | | | | 1 | | 2 | | 2 | 2 | 11 | 7 | 4 | 1 |
| Nachingwea | 41 | 2 | 2 | | 1 | | 1 | | 1 | 1 | 1 | | | | 1 | | 2 | | 1 | | | | 1 | |
| Butimba | 60 | 18 | 2 | | 1 | | 1 | | 6 | 1 | | | 1 | | 1 | | 2 | | 1 | | 11 | 3 | 3 | |
| Bunda | 44 | 8 | 2 | 1 | 3 | | 1 | | 2 | 1 | | | | | 1 | 1 | 2 | | 0 | | | | 2 | |
| Mur'tunguru | 16 | 1 | 1 | | 1 | | 1 | | 2 | | | | | | 1 | 1 | 2 | | 1 | | | | 1 | |
| Tabora | 60 | | 1 | 0 | 2 | | 1 | | 3 | 1 | | | 2 | | 4 | | 2 | | 1 | | 11 | | 3 | |
| Ndala | 17 | 12 | 1 | | 2 | 1 | 1 | | 2 | | 1 | | | | 5 | | 2 | | 0 | | 7 | | 2 | |
| Dakawa | 28 | | 1 | 1 | 1 | | | | 2 | 1 in morogoro | | | | | 1 | | 2 | | 0 | | | | 1 | |
| TOTAL | 454 | 53 | 18 | 4 | 16 | 1 | 11 | 1 | 27 | 5 | 5 | 0 | 3 | 0 | 24 | 5 | 24 | 0 | 11 | 3 | 53 | 16 | 22 | 2 |
| DIFFERENCE | 401 | | 14 | | 15 | | 10 | | 22 | | 5 | | 3 | | 19 | | 24 | | 8 | | 37 | | 20 | |

# Annex 4 – Protocol for Teachers Colleges Visits

Protocol

for Information Collection from Teachers Colleges

Date:

Name of Teachers College:

Name of Data Collector:

# TABLE OF CONTENT

# PART 1 – INITIAL MEETING WITH THE MANAGEMENT, TUTOR REPRESENTATIVES, TEACHER STUDENT REPRESENTATIVES AND REPRESENTATIVES OF OTHER STAFF

The purpose of the meeting is to explain the visit, inform about the evaluation and to agree on the schedule for the visit.

Proposed Agenda:

1. Presentations[13] of participants[14]
2. Information about the evaluation
3. Purpose of the visits to teachers colleges
4. Questions and answers
5. Adjusting – if needed – the Schedule of the visit
6. Advice on how to conduct the survey to tutors

Information given to the evaluator will be treated with confidentiality – citations in the report will be anonymous.

[13] Please present yourself as part of an independent evaluation team – not part of MoEVT or the Swedish Embassy/Sida.

[14] Important that names and position of each participant is recorded in attached list (Part 9 of this guideline)

PART 2 – INFORMATION ABOUT THE EVALUATION

## The Evaluation

The overall objective of the evaluation is to find out what actually has been achieved, what lessons have been learned during the program implementation and establish what can be improved in the MoEVT continued implementation of ICT in Teachers Colleges.

- The issue of using ICT in teaching and learning, including assessments, e-learning and professional development, will be assessed as well, through interviews, observations and curriculum.

- The evaluation will look at the use of ICT in human resources management and in other management and administration processes through a review of administration manuals and interviews of administrative staff.

- The ICT infrastructure will be assessed through inventories and on-the-site observations through visits to at least 12 Teachers Colleges.

The evaluation will assess achievements by the project and sustainability:

a) What was achieved during the project period 2005-2008
b) What is the situation today in February 2014

## The Project

In the period 2005 to 2008 the Ministry of Education and Vocational Training (MOEVT) in Tanzania secured funding of USD 3,733,000 from the Government of Sweden through Sida to implement a project on ICT in Teachers Colleges. All 32 Government Teachers Colleges were provided with up to date ICT equipment and broadband internet connection. Primary beneficiaries to this initiative were the 32 Government Teachers Colleges with about 900 tutors and 16 700 student-teachers.

After the completion of the project in 2008, ICT in Teachers Colleges was continued as a program at the MoEVTusing Ministry's own resources.

**Long Term Development Objective of the Project**
The developmental objective of the project was to *improve the quality of education in Teachers Colleges and Schools* by integrating ICT in Teacher Education in order to make all student-teachers ICT literate on completing their course. Colleges would benefit from ICT use as a teaching and learning tool as well as for management purposes thus improving the quality of education in Teachers Colleges and Schools.

**Short Term Specific Objectives (Outcome level)**
The stages towards attaining the long term Development Objective are reflected in the short term specific objectives as described in the Project description:

- Established workforce of highly trained tutors with appropriate skills and attitudes to apply ICT in enhancing teaching and learning;
- Improved teaching capacity through teachers use of Internet for accessing and sharing knowledge and experiences;
- Increased opportunities for professional development through online learning and distance education of teachers; and
- Improved transfer of information among Colleges of MoEVT

The Project aimed at an integration of ICTs into Education in consideration of all the benefits to enhance teaching and learning that technology promises. But also all challenges teachers will face transferring from a controlled college context into everyday teaching environments marked by scarcity of most resources let alone ICT facilities.

**Outputs**
By the end of the project in 2008, the following outputs were expected to be achieved:

1. The required hardware (i.e. 976 computers, routers, printers, digital cameras) and software purchased and installed in all Teachers Colleges,
2. A Lead College for coordination and support of ICT was identified (Morogoro Teachers College)
3. 2 ICT tutor technicians for ICT support trained in each Zonal college,
4. 906 tutors on basic ICT skills trained
5. 148 Trained specialist ICT tutors on use of ICT as a teaching and learning tool trained
6. Management level trained in ICT

**Implementation of the project**

The project was implemented by the Ministry of Education and Vocational Training (MoEVT) of Tanzania through an Agreement with Sida. The responsible unit at the Ministry was the Department for Teacher Education, which had the overall responsibility for monitoring and evaluation of the project as well as for facilitation of the overall management of the implementation.

A steering committee was set up for the project, with representatives of the main stakeholders from the ministry, the Teachers colleges, secondary schools, the University of Dar es Salam and the Tanzania Institute for Education (TIE).

The lead Teachers College for the project was Morogoro Teachers College, where the project office was set up, supported by consultants/specialists during the project. The

lead college was responsible for developing the training and the training material, as well as for procurement and the training.

There are seven educational zones, each with a zone Teachers College. These colleges were capacitated through training of trainers and technicians to provide support to the other colleges in each zone and to provide trainings and support. Each Teachers college had two staff members/tutors trained to provide first level technical support.

PART 3 – SCHEDULE FOR VISIT TO TEACHERS COLLEGE

| Time | Activity | Place | Participants |
|---|---|---|---|
| 8.30-9.30 | Initial meeting | | Management, Tutors, ICT tutor technicians/ICT technicians, Student representatives etc. |
| 9.30-10.30 | Group discussion with Student-teachers | | Student-teachers in their final year |
| 10.30-11.30 | Group discussion with Tutors | | Available tutors, at least 8-10 tutors |
| 11.30-12.00 | Survey to tutors | | Tutors, at least 20 |
| 13.00-15.00 | Interview with management | | Management |
| 15.00-16.30 | Inventory of computers, peripherals, hardware and software, Internet and electricity | | Responsible person from management, ICT Tutor technicians/ ICT technicians |
| 16.30-17.00 | De-briefing meeting with management | | Management |

The schedule will be adjusted according to the availability of interviewees and convenience of each teachers college.

PART 4 – SURVEY OF TUTORS KNOWLEDGE AND USE OF ICT

College:

……

……

A.

Age: | | Sex:

| Male | Female |
|---|---|
| | |

Work as tutor since (year): | |

K.

1. *I have been sufficiently trained in basic ICT skills/knowledge.*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

2. *I have been sufficiently trained in how to use ICT in my teaching.*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

3. *The ICT equipment in this Teachers College are functioning well.*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

4. *The software in this Teachers College is functioning well.*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

5. *. The internet connection in this Teachers College is functioning well.*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

6. *The internet connection in this Teachers College is sufficient for teaching and learning purposes.*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

7. *I am using ICT in my teaching and learning.*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

8. *I am using internet for accessing and sharing of knowledge and experience*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

9. *I am using internet for my professional development through online learning, blended learning or distance education*

| I totally agree | I agree | I neither agree or disagree | I disagree | I totally disagree |
|---|---|---|---|---|
| | | | | |

PART 5 – INTERVIEW WITH MANAGEMENT

## A. Hardware and software purchased and installed in all colleges, the status at the end of the project and in February 2014.

*Question 1: What were your experiences with the computer/network equipment, Internet access and software initially provided by the project? Did they work well? Did they respond to your needs, etc?*

*Question 2: What kind of computer/network equipment and Internet access have you acquired after the end of the project and why? When and where were the equipment installed? Where did the financing come from to buy new computer/network equipment and Internet access after the project ended?*

*Question 3: What are your experiences with the current computer/network equipment and Internet access in terms of functioning, adapted to your needs etc?*

*Question 4: What were your experiences with the software initially provided by the project? Did they work well? Did they respond to your needs, etc?*

*Question 5: How has the computer/network equipment and Internet access (including monthly Internet access charges) been maintained after the end of the project (technical competence, support systems, financial resources etc)?*

*Question 6: Have you recruited ICT technicians since the end of the project? If yes, why and how many of them and what is the nature the contract provided to them?*

## B. Training
## L.

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***a) Initial ICT Tutor Technician training***

(Initial tutor technician training focused on skills for installation and maintenance of the equipment provided by the project, concentrating on software installation and trouble shooting, following CISCO IT Essentials and courses facilitated by the University of Dar es Salaam Computing Centre (UCC)).

*Question 7: What is your opinion about the initial ICT Tutor Technician training, was the training provided by the project in 2005-2008 sufficient in quality and in number of tutors trained?*

*Question 8: When and where have tutor technicians of this college received initial ICT Tutor Technician training after the project ended and who financed/supported it?*

*Question 9: What is your opinion about the training initial ICT Tutor Technician training*
*after the project ended and up until today? Is it well organized? Is it sufficient? Is there any other related training to date and who financed/supported it?*

***M.*** ----------

***b) Basic ICT skills training***

(This is the training for International Computer Driver Licence or other similar or modified training)

*Question 10: What is your opinion about the training in basic ICT skills, was the training provided by the project in 2005-2008 sufficient in quality and in number of tutors trained?*

*Question 11: When and where have tutors of this college received basic ICT skills training after the project ended and who financed it/them? What is your opinion about the training in basic ICT skills after the project ended and up until today? Is it well organized? Is it sufficient?*

*Question 12: Is there any other ICT training provided to tutors other than basic ICT skills training? If yes, what was the objective, outcome and who financed/supported it. Do you think there are gaps in this training area that still needs to be covered? Please explain.*

----------

***Training in the use of ICT as a teaching and learning tool***

*Question 13: What is your opinion about the training on use of ICT as a teaching and learning tool, was the training provided by the project in 2005-2008 sufficient in quality and in number of tutors trained?*

*Question 14: How useful was the training? Do you think that the training provided was adequate for the tutor to use ICT in their teaching and learning? Do you think there are gaps in the training that should have been covered? Please explain.*

*Question 15: When and where have tutors of this college received training on use of ICT as a teaching and learning tool after the project ended? Who provided the training? At who's initiative/cost?*

*Question 16: What is your opinion about the training on use of ICT as a teaching and learning tool after the project ended and up until today? Was it well organized? Was it sufficient?*

*Question 17: Is this college using the ICT curriculum and training material developed during the project? Have these been adjusted and/or replaced after the end of the project?*

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### *c) ICT training to the Management*

*Question 18: What is your opinion about the training provided to the management, was the training provided by the project in 2005-2008 sufficient in quality and in number of management staff trained?*

*Question 19: What training has been provided to the management since the project ended?*

*Question 20: What is your opinion about the training provided to the management after the project ended and up until today? Was it well organized? Was it sufficient?*

*Question 21: How has this project improved transfer of information among Colleges and to the Ministry etc? Give examples.*

## C. Sustainability

*Question 22: On average how would you rate the level of competence in ICT in this Teachers College among:*

Management: very high/high/satisfactory/not satisfactory

Tutors: very high/high/satisfactory/not satisfactory

Tutor technicians: very high/high/satisfactory/not satisfactory

*Question 23: On average how would you rate the level of pedagogical improvement due to ICT skills/knowledge?*

Tutors: very high/high/satisfactory/not satisfactory

Student-teachers: very high/high/satisfactory/not satisfactory

*Question 24: The program identified a risk of losing ICT competent staff to others paying higher salaries. Has this happened?*

*Question 25: Are there any efforts to retain pedagogical and technical staff? What are they?*

*Question 26: Does the college get sufficient support on ICT in teacher training from the Ministry of Education and Vocational Training?*

*Question 27: How well can the college sustain ICT in teacher training (technical requirements/support, human resources, financing etc)*

## D. Use of ICT in Management

*Question 28: Are you using ICT for any administrative processes? How is it used? (this question requires that management systems are demonstrated to the data collector)*

*Question 29: How many of the staff in management and administration have access to computers and Internet in their offices?*

*Question 30: Do you have ICT Guidelines? S IT IMPLEMENTED? (Ask to see the Guidelines)*

PART 6 - SEMI-STRUCTURED GROUP DISCUSSION WITH TUTORS (40 MINUTES)

*(Please include at least 8-10 tutors, representing as many subjects as possible)*

**Question 1**: How many training courses in basic ICT skills did you receive? Do you think that the training received was adequate for you to use computers and internet with confidence? What tasks can you do on the computer and which tasks you cannot do? If not, what additional training do you require?

**Question 2**: How many courses of training did you receive in using ICT for teaching and learning purposes? Was this training adequate to enable you to use ICT for teaching and learning purposes? Give examples of how you used the ICT skills for teaching and learning purposes? What could still be improved?

**Question 3**: Computers and other equipment have been procured, different software installed, Internet connection put in place and in some cases solar power arranged. Is it working well? What could be improved?

**Question 4**: How are you using ICT in your teaching of the student-teachers? Please give examples? How do you find online teaching/learning resources? Please give an example of site that you have found particularly useful? How frequently do you use it? Is it working well or are there some obstacles? Should anything more be done to further facilitate the use of ICT in your teaching and learning? Do you share information about a useful site with your colleagues? Give examples.

**Question 5**: How are you teaching the Student-teachers to use ICT in their own teaching? Are you giving examples related to the curriculum in primary and secondary schools where they can use ICT? Please give examples. Are they given assignments on the use of ICT in their own teaching? What kinds of assignments are given – list three?

**Question 6**: How are you using ICT for professional development, online learning, blended learning and distance education? Is there any distance education, online or blended learning courses available online? Have you taken any of those?

**Question 7**: How are you using ICT for knowledge sharing and communication? What kind of information do you share, please give examples. Do you use Moodle or resource folder? Do you belong to any online internet groups or social networking

media (Yahoo-group, Linkedin, Facebook etc)? How does the network help you share knowledge and experiences?

**Question 8**: What is your opinion about the ICT readiness of the Student-teachers when they leave the Teachers College? Are they prepared to use ICT in their own teaching? Are the schools ready to use their ICT skills and properly equipped with ICT equipment?

**Question 9**: How has your teaching changed, compared to the past, as a result of the training and access to internet? Please give examples.

**Question 10**: How many of you own a lap top? Smart phone? Modem? Flash disk? What use do you make of these gadgets?

**Question 11**: Do you have an email address? Do you have a Facebook account? For what purpose do you use the email and Facebook?

**Question 12**: Do you have any suggestions for improvement of ICT in teacher education?

PART 7 – SEMI-STRUCTURED GROUP DISCUSSION WITH STUDENT-TEACHERS (40 MIN.)

**Question 1:** Did you use computers or internet before joining the college?

**Question 2**: Computers and other equipment have been procured, different software installed and internet connection arranged. Is it working well? What could be improved? Do you have free access to computers? Can you use it in your free time?

**Question 3:** How are you trained to use ICT in your own teaching? How many hours per week does the training take place? Are you given examples related to the curriculum in primary and secondary schools where you can use ICT? Are you given assignments on the use of ICT in your own teaching?

**Question 4**: How are you using ICT for your own professional development, searching information, online learning and distance education? Is there any online learning or distance education courses available? Have you taken any of those? Please give examples.

**Question 5**: What is your overall opinion about your ICT readiness when you leave the Teachers College? Are you prepared to use ICT in your own teaching?

**Question 6**: Are the schools ready to use your ICT skills and properly equipped with ICT equipment when you have graduated? What are your experiences of ICT in BTP (Block Teaching Practice)?

**Question 7**: How many of you own a lap top? Smart phone? Modem? Flash disk? What use do you make of these gadgets?

**Question 8**: Do you have an email address? Do you have a Facebook account? For what purpose do you use the email and Facebook?

**Question 9**: Do you have any suggestions for improvement of ICT in teacher education?

PART 8 – INVENTORY, INTERNET, ELECTRICITY, HARDWARE, PERIPHERALS AND SOFTWARE

(Do this together with the ICT tutor technician or the ICT technician)

*1: What Internet connectivity and electricity supply are in use today by the college?*

**Internet**
Service Provider:
Bandwidth:
Reliability:
Wifi?

**Electricity:**
Main Power Source/Service Provider:
Capacity/reliability:
Alternative power source(s):

*2: What computer/network equipment and peripherals is in use today (thin clients, servers, desktops, laptops, printers, projectors etc)? (Please specify in the following table)*

| **Item** | **Brand and model** | **Number of items** | **Condition**[15] |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| | | | |

[15] Please indicate condition of equipment as G=good; P=poor; X=not in use

## PART 9 – PEOPLE INTERVIEWED[16]

| Name | Position |
|---|---|
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| | |

[16] Please get the email of the principal and the ICT responsible person

# Annex 5 – Time Schedule

| Day | Activity |
|---|---|
| **Inception** | |
| 10-20 January 2014 | Inception report |
| 21-31 January | Review, MoEVT Eval Managem group |
| 1-15 February | Preparations for field work |
| **Field visit Tanzania** | |
| Monday 17 February, am | Internal team meeting |
| Monday 17 February, pm | Briefing meeting at the Swedish Embassy |
| Monday 17 February, pm | Meeting with MoEVT |
| Tuesday 18 February, am | Meetings with staff at MoEVT |
| Tuesday 18 February, pm | Inception workshop |
| Wednesday 19 February | Morogoro Teachers College |
| Thursday 20 February | Morogoro Teachers College |
| Friday 21 February, am | Review of protocol for visits to Teachers Colleges and training of data collectors |
| Friday 21 February, pm | Preparations for field visits |
| Saturday 22 February | |
| Sunday 23 February | Travel |
| Monday 24 February | Field visits to Teachers Colleges |
| Tuesday 25 February | Field visits to Teachers Colleges |
| Wednesday 26 February | Field visits to Teachers Colleges |
| Thursday 27 February | Field visits to Teachers Colleges |
| Friday 28 February | Field visits to Teachers Colleges |
| Saturday 1 March | |
| Sunday 2 March | |
| Monday 3 March | Internal team work, compiling information from field visits |
| Tuesday 4 March, am | Preparing workshop |
| Tuesday 4 March, pm | Evaluation Workshop |
| Wednesday 5 March | Additional meetings with MoEVT |
| Thursday 6 March | Report writing |
| Friday 7 March | Final evaluation group meeting |
| **Reporting** | |
| 10 – 24 March | Drafting Evaluation report |
| 24 March | Submitting Draft Report |
| 4 April | Comments on draft report by the Embassy stake-holders |
| 7 – 14 April | Work on final report including final quality assur-ance, |
| 15 April | Final report submitted, |

# Annex 6 – People Interviewed

| Name | Position |
|---|---|
| **Dar es Salaam** | |
| Prof Eustella P. Bhalalusesa | MoEVT, Commisioner for Education |
| Bakari G. Issa | MoEVT, Director Teacher Education |
| Helen A. Lihawa | MoEVT, Assistant Dir Teacher Education Department |
| Richard Nzoka | MoEVT, ICT responsible Teacher Education Department |
| Mchikirwa Kafumu | MoEVT, Acting Director School Inspectorate |
| Tulinagwe Ngomile | MoEVT, School inspector |
| Fanuel Mshane | MoEVT |
| Nicholaus Moslu | MoEVT |
| Hellen A. Lihawa | MoEVT |
| Fredrick Shuma | MoEVT |
| Edicome Shirime | MoEVT |
| Elia Kibga | MoEVT |
| Mwajabu Adam | MoEVT |
| Martha Qaresi | MoEVT |
| Joel Mwamesanguele | MoEVT |
| Baselina Levira | MoEVT |
| Omar Mzee | Embassy of Sweden, Program officer for ICT |
| Joyce Msolla | Program Coordinator (retired) |
| **Dakawa Teachers College** | |
| Erasto G Nywage | Principal |
| Tutindaga Masebo | Sports Coordinator Ass. |
| Asumra Mully | Project Coordinator |
| Arit D. | Environmental Manager |
| Salamba Reuben | - |
| Fatuma Nanibunga | Social welfare |
| Milton R Rwekaza | College Tutor & System Administrator |
| Moshi Zawadiel | College Tutor & Head of ICT |
| Bahati S Mwampulo | College Tutor |
| Sospeter James | College Tutor & ICT Tutor |
| Aloyce Mbishila | College Tutor |
| Leonid L Nkuba | College Tutor & ICT Tutor |
| **Kinampanda Teachers College** | |
| Maulid Njau | Principal |
| Ester Mkwambe | Vice Principal |
| **Kleruu Teachers College** | |
| John Vedasi Nandi | Principal |
| Onespho N. Sedekia | Head of ICT, CISCO Instructor |
| Elimeleck I. Kilasi | ICT Tutor, CISCO Instructor |
| Peter B. Kimweri | IT Essentials Instructor |
| Mohamed M. Suleiman | Physics Tutor |
| Mohamed A. Mbasha | Mathematics Tutor |

| | |
|---|---|
| Budy Gumbo | ICT Tutor |
| Herieth Mtweve | Communication Skills Tutor |
| Oscar Mnyawami | Com. Skills Tutor/Basic Computer Literacy |
| Philomena Dominic | Com. Skills Tutor/Basic Computer Literacy |
| **Morogoro Teachers College:** | |
| Wolfram A. Ngonyani | Principal |
| J. M. Sekulu | Ass. Computer Network and systems Admin. |
| Oscar D. Mlowe | Systems Administrator |
| George Chalale | Ass. Curriculum Coordinator |
| Joyce Baravuga | Infrastructure Coordinator |
| Joseph Timothy Hilal | Head of ICT Department |
| Robert Matemo Chassama | ICT Tutor |
| Herry Wilson | ICT Tutor |
| Zephania Semeitei | ICT Tutor |
| Wlliam B Haule | Tutor |
| Tadei P. Gabriel | Tutor |
| Shuffa T. Salum | Tutor |
| Aphel A. Ndess | Tutor |
| Ismail H. Maira | Tutor |
| Godfrey Omary | Tutor |
| Nuru Ibrahim | Tutor |
| Martin Ndedya | Tutor |
| Maria Felician Castor | Tutor |
| Noel Mgani | Tutor |
| Yusuph Ntambala | Tutor |
| Asha Kiliza | Tutor |
| Majid S. Mwalyego | Tutor |
| Lilian Mutasa | Tutor |
| Leah P. Mkini | Tutor |
| **Mtwara Techer College** | |
| Simon William | ICT Tutor |
| Juael Joseph | ICT Tutor |
| Saidi M. Mkulia | ICT Tutor |
| Leonard Didas Mkombe | Geography Tutor |
| Karimu Omary | Curriculum and Teaching Tutor |
| Lucia G. Ngonyani | Kiswahili Tutor |
| Daniel C. Kayombo | Student Second Year |
| Edmund Wilbard | Student Second Year |
| Ally S. Abdallah | Student Second Year |
| Eliwaja W. Mkhandi | Principal |
| Siwengi Issa | Education Psychology Tutor |
| Simon Matikiti | Geography Tutor |
| Karimu Omary | Curriculum and Teaching Tutor |
| Kashanus Maksi | Educational Research Measurement and Eval. |
| Lucia G. Ngonyani | Kiswahili Tutor |
| Fadhili F. Kayanda | Physical Education |
| Gervace Anthony | Educational Psychology/Kiswahili |
| Leonard Didas Mkombe | Geography Tutor |
| Simon William | ICT Tutor |

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| Juael Mganga | ICT Tutor |
| Saidi M Mkulia | ICT Tutor |
| **Muritunguri Teachers College** | |
| Augustine Sahili | Principal |
| Elias Mageni | Vice Principal |
| Frank Sylvester | ICT Tutor |
| Michael Bigambo | System administrator |
| Wilfred Kayunfi | Tutor |
| Elias Chamba | Tutor |
| Richard Peter | Tutor |
| Evamary Ngolly | Tutor |
| Edinatha Wamala | ICT Head |
| William Philipo | Tutor |
| **Nachingwea Teachers College** | |
| Moshi M. Mmanywa | Principal |
| Louis H. Letta | Vice Principal |
| Justine L. Ngimba | Head of ICT Department |
| Stephen C. Mwamba | ICT Integrator Tutor |
| Emanuel L. Chitopela | ICT Tutor with Science Subjects |
| Masumbuko Mpoli | Psychology Tutor |
| Mohamed Rashid Mwalim | ICTtutor |
| Ally Bilali Athumani | Geography Tutor |
| Deogratius Ndunguru | English Tutor |
| Sambayeti Godlove | Curriculum Psychology and Kiswahili |
| Ahmed Mniachi | ICT Tutor |
| Twise Partson Mwakilembe | English/ Swahili Tutor |
| Dismas E. Nivahe | Research Measurement & Kiswahili |
| Winifrida Mrope | Psychology |
| Justine L. Ngimba | Head of ICT (Technical) |
| Emanuel L. Ngimba | ICT Tutor (ICDL) |
| Mohamed Rashid Mwalim | ICT Tutor (Technical) |
| Ahmed Mniach | ICT Tutor (ICDL) |
| Stephen C. Mwamba | ICT Integrator Tutor |
| Twahili Said | ICT Tutor (ICDL) |
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| OSWARD MABUBU | ICT Integration tutor |
| ZAWADI DENDE | Tutor |
| JOHN DANGAT | Vice Principal |
| NILAHILA LUFUTU JAMES | ICT Technician |
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| Adam H. Bunda | Head of ICT department |
| **Tandala Teachers College** | |
| Clement J Kabuje | Principal |
| Jackson N Thamala | ICT Administrator/Dean of Students |
| Emos M Mahenge | Academic Dean |
| Beno S Silwani | Maths tutor |
| Lulu Lawa | Vocational skills |
| Stephen Mwamtore | Sports & Personality Tutor |

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|---|---|
| Asekelile Alex | Mathematics Tutor |
| Bosco J Mwapiwua | Science Activities Tutor |
| Godlove Mhagama | ICT and English Tutor |
| Enitha Mdemu | Psychology Tutor |
| Saturino Kigava | ICT & Mathematics Tutor |
| Gipson Mtawa | TEHAMA-Social Welfare Chairman |
| Urlick Ndunguru | Registrar, Geography tutor |
| Sikudhani Mlelw | Tutor English Activities |
| Ashura S Mtima | Counsellor/Matron |
| Gonza Mdele | Head of Dpt-Pre-Primary Education |
| **Vikindu Teachers College** | |
| Sultan Juma | Tutor (TEHAMA/Kiswahil |
| Fredson F. Urassa | Tutor/Academic Dean & System Administrator |
| Emiliana Nyakaraita | Tutor (History/Education) |
| Augustino Joseph | Tutor/ICT – Head of Departmrnt |
| Ngowoko C.V | Teacher Trainer/Communication Skills |
| Albert Mutalemwa | ICT Tutor |
| Safiel T. Kabora | Tutor/Registrar |
| Mmari D.P | Tutor (Kiswahili/Education) |
| Malata, John J. | Tutor (Science & ICT) |
| T. Kibona | Tutor/Dean of Students |
| Urassa Fredson | Tutor – Academic Dean & System Administr, |
| Sultan Juma | Tutor (Tehama & Kiswahili) |
| Emiliana Nyakaraita | Tutor |
| Safiel T. Kabora | Tutor/Registrar |
| Malata, John J. | Tutor |
| Masasi Felister | Tutor ICT |
| Mmari Dyness P. | Tutor (Education & Kiswahili) |
| T. Kibona | Tutor/Dean of students |
| Ngowoko C.V | Teacher Trainer |
| Albert Mutalemwa | Tutor (ICT/Music) |
| Augustino Joseph | Tutor – ICT & ICT Head Department |
| Albert R. Mutalemwa | ICT Tutor |
| Fredson F. Urassa | Academic Dean & system Administrator |
| Augustino Joseph | ICT – Head of Department |
| **Sweden** | |
| Nils Jensen | Former ICT Program Manager, Embassy of Sweden in Dar es Salaam |

# Annex 7 – Reference Documents


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# Evaluation of Implementation of ICT in Teachers' Colleges Project in Tanzania

This is an evaluation of the ICT in Teachers' Colleges project (2005-2008) by the Ministry of Education and Vocational Training (MoEVT) in Tanzania. All (34) government Teachers' Colleges were provided with training, up to date ICT equipment and broadband internet connection. The developmental objective of the project was to improve the quality of education in Teachers' Colleges and schools by integrating ICT in teacher education in order to make all student-teachers ICT literate and able to use ICT in their teaching.

The project was efficiently managed and there was considerable commitment from MoEVT, contributing to overcoming initial problems. The evaluation finds that objectives were mostly met but an insufficient number of computers and unreliable internet connections have been obstacles for the preparation of student-teachers to teach ICT and use ICT in their teaching.

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