Capacity Building of ICT in Education for Rural Areas: a case of Lugoba Secondary School – Tanzania

A Thesis Submitted

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by

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Dedication

I dedicate this thesis work in honor of my beloved children

GERVAS IGNATIO and GRACELYNE JUDICA

And my loving husband

EMIGIDIUS BIKANYA KASUNZU
Acknowledgements

To finally produce this thesis work, I was guided, supported, encouraged and given endless efforts by many people who deserve my gratitude thanks.

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Abstract

Proficiency in Information and Communication Technologies (ICTs) skills is now regarded as important as basic reading and writing skills. This technology is designed to enhance the flow of information and communication; it’s a means to access information and knowledge. It opens up education more widely, and creates a valuable opportunity for all those involved in education to reconsider their practices, and in so doing to develop a more reflective approach to their educational activities. Capacity building in the use of ICT for education aims at improving literacy and teacher trainings with regard to ICT services.

To make the best use of ICT tools, teachers must understand the relevance, usefulness and usability of those tools. Teachers need to be computer literate themselves and be confident in the use of ICT in order to understand what ICT can do to enhance their own development and to enrich the learning experience of their students. In this aspect, we aim at training teachers in computer skills and later incorporation of ICT into their teaching functions.

This research is an effort to equip Lugoba Secondary School (LSS) teachers with the knowledge, understanding and skills of ICT and when and how to use ICT in their teaching. Teachers need to be enabled and empowered to evaluate the effects of using new technologies in their teaching, and then to begin to develop their own communities of practice to assist them more effectively in enabling their students to enhance their learning opportunities.
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Abbreviations

ICT – Information and Communication Technology

LSS – Lugoba Secondary School

ICT4RD – Information and Communication Technology for Rural Development

KTH – Kungliga Tekniska Högskola, The Royal Institute of Technology

SIDA – Swedish International Development Agent

COSTECH – Commission of Science and Technology

DIT – Dar es salaam Institute of Technology

PC – Personal Computer
1. Introduction
1.1. Background

Information technology skills are highly valued in today’s societies. In the schools teachers are facing the challenging task to offer them and students the skills required by the information society. The ability to use ICT effectively and appropriately is now seen as essential to allow learners to acquire and exploit information within every sphere of human activity [1]. It can be assumed that specific forms of ICT will change with time. However, the need to be able to evaluate and use ICT purposefully will remain the key to full participation in an information society. The Information and Communication Technologies (ICTs) can help to broaden access to education and improve learning outcomes. The success in the use of ICT in education depends largely on teachers and their level of skills in integrating ICT into the teaching process and in utilizing ICT to provide learner-centered, interactive education [2]. Therefore, we need to build teachers capacity in use of ICT for education by training teachers to be able to use ICT and to integrate ICT into teaching for achieving improved educational outcomes with ICT. To make the best use of ICT tools, teachers must understand the relevance, usefulness and usability of ICT tools [3].

The Information and Communication Technology for Rural Development (ICT4RD), together with a collaborative efforts from COSTECH\(^1\), SIDA\(^2\), and DIT\(^3\) came up to provide rural transformation services in Tanzania by launching technology to facilitate, change and improve services, by making it easily available and accessible in the areas of health, education and local government authorities [4]. Currently, the project is running two pilot sites, Serengeti (Serengeti and bunda) and Wami (Chalinze, Lugoba, Miono). The purpose of the ICT4RD project has been to design and validate a strategy for how to establish sustainable broadband markets in rural Tanzania and to propose a national connectivity programme [5]. These pilots utilize broadband infrastructures in

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\(^1\)COSTECH – Commission for Science and Technology, www.costech.or.tz
\(^3\)DIT – Dar es salaam Institute of Technology, www.dit.ac.tz
which networks are setup and various ICT services such as www, email, Voice over IP, internet services, e-learning applications in secondary schools just to mention few have been installed to facilitate the easy communication in these rural areas.

This research, intends to bring about a perceptible and permanent quality improvement in the education era, with a case study at Lugoba Secondary School (LSS). Despite the efforts of ICT4RD project to provide educational ICT services in LSS, still there is lack of capacity building (ADD REFERENCE NO). Our research, targets LSS as a focal point so as to bring in maximum use and benefits of ICT which can only be derived through corresponding changes in approach to teacher training, curriculum development and administration. Overall, the support from LSS teachers is necessary and all these, can be achieved by building capacity on ICT for education.

Most of the evidence in the past years has indicated that efforts to ensure equal access to educational opportunities and quality education for all must be accompanied by wide-ranging education reforms [7]. These reforms are not likely to succeed without addressing the new roles played by teachers in preparing students for an emerging knowledge-based and technology-driven society. Teachers must have access to adequate training and ongoing professional development and support and be motivated to use new teaching and learning methods and techniques [8].

Therefore, this report presents findings of our thesis work, in building the capacity of ICT in education for rural areas the focus being at Lugoba Secondary Schools. As a first step, we raised teacher’s awareness on ICT; secondly they needed to be computer literate and empowered to evaluate the effects of using ICTs. Teachers need to be confident in the use of ICT in order to understand what ICT can do to enhance their own development and to enrich the learning experience of their students. Training teachers in the appropriate use of new technologies was one of the most important places to start in delivering effective teaching programs.
1.2. Research Problem

Information technology skills are highly valued in today’s societies. Teachers in LSS actively participated in various courses to learn how to use information and communication technologies in education. Despite the diverse supply of training, there was still need for improvements, since the educational use of ICT resources has remained low. To tackle this problem, our thesis focused on teacher’s training by demonstrating practically the effectiveness of the ICT services for educational purposes.

1.3. Research Objectives

The main goal of this research is to improve ICT use in education by building capacity of ICT to teachers at LSS. The research involved direct interaction with the LSS teachers’; the following were specific objectives to be achieved:

- To equip teachers with knowledge, understanding and skills by raising their awareness on ICT
- To enable teachers to be computer literate by providing them with basic trainings on computer
- To make sure that ICT is a focus on teachers needs
- To enable teachers to make sound judgments about when and how to integrate ICT in the classroom.
- To enable teachers to acquire the confidence and skills to make use of and to integrate ICT into their lesson plans and teaching of the subjects in the classroom.
- Provide access to relevant information through ICTs and the Internet

1.4. Research Motivation

The motivation behind doing this research was risen from the need of the LSS. The emphasis being in awareness of using ICT for education purposes, increasing the use of ICT in their learning, to provide teachers with access to an ever-growing pool of teaching materials through the use of ICT; provision of
necessary ICT tools and resources for teachers to use to improve their ICT skills and to utilize to produce better learning outcomes. Teachers, first need to gain the knowledge, select and evaluate ICT resources that are suitable for teaching and learning in their own subjects. In particular, teachers need to be able to use the internet to search and select, information and resources that are relevant for their subject and their students. As such, we have been motivated to build the capacity of the LSS community in ICT for education.

1.5. Methodology/Working Method

Teachers are the key to the successful integration of ICT into education. They manage the processes of teaching and learning. Our thesis work, offered a tailored education to improve the LSS teacher’s ICT skills in education. The main theme of our project was to enhance and provide capacity building in the use of ICT for education in the everyday schoolwork. The following methodologies were employed:

Background information about teachers working context with regard to ICT usage were gathered. The ICT usage perceptive from the schools’ headmaster and teachers were taken into account when collecting information about teacher’s skills and required ICT needs. The ICT technical equipments of the school in the computer laboratory were set up, this involved the connection of the pc, setting up and testing the internet cables.

The planning of the training started with the discussion with the both school masters (head and second masters). According to them there has been several ICT courses and trainings in which teacher’s participated. The problem was that the new skills and ideas gained hadn’t been transferred into everyday teaching. One supposed reason was that duration of the training given was in a short period of time and interfered with the school timetable, also the content taught was not given to the teachers in terms of ‘quick reference notes’ for their refreshment hence resulted in a lost of connection to the teachers subjects and everyday teaching.
We conducted an interview to get the overview of the teachers’ skills and needs. According to the analysis, teachers had participated on various ICT-courses but hadn’t much used the new skills in teaching or any other work. Basic skills had been offered, but any practical examples of using the new skills in teaching weren’t shown. Most of the teachers wanted to develop their skills and knowledge in the use of different technical tools in their everyday work in a classroom context. After analyzing skills, needs and equipment, the framework for our thesis work was planned. Training was decided to be carried out with face-to-face sessions. Face-to-face sessions were preferred by all teachers as it offered possibilities to notice special needs.

Teachers of the LSS school were called to participate in an opening seminar where the specific goals of our research were discussed. After the meeting, teachers decided and assured us for their participation on the training. The framework was specified and the time-schedule was planned. There were 29 LSS teachers from different subjects who agreed and devoted to participate in this research although we expected about 40 teachers to participate but due to other school schedules only 29 could participate fully. The heterogeneity and different needs of the participants offered both many possibilities and challenges for the collaborative work. A hands-on approach was taken during the research. Several exercises were designed to impart relevant skills and knowledge by having LSS teachers work through real-life examples and scenarios. The implementation and outcomes of the thesis work is represented in the next chapters.

Towards the end of the research work, questionnaires were distributed to get feedback and provide basic information on ways in which ICT is currently being used, how competent teachers feel themselves to be, their views on their own needs and priorities for further development, the kind of training which will help them develop further, and the factors which tend to encourage or hinder the take-up of ICT. (Full questionnaire is presented in Appendix A). Also, a response sheet (Appendix B) was designed for the head teacher to give his feedback and recommendations.
Follow-up scenario interviews were held. These interviews were designed to elicit in-depth feedback on the ICT training that was offered. Respondents were given the task of talking through how they would respond in particular situations, thereby highlighting not only their current knowledge but also their understanding of how that knowledge can be applied in different situations. The scenarios were designed to allow the research to take account of the concerns and challenges experienced by teachers in relation to how they can build their capacity toward ICT for Education.

1.6. Thesis Report Outline

This report mainly covers 6 sections which are outlined below:

- Introduction section which covers research background information, problem, motivation and methodologies which were employed.
- ICT at LSS (Part I)
- Challenges faced (Part II)
- Recommendations (Part III)
- Conclusion and future works (Part IV)
- References and Appendixes (Part V)
Part I

2. ICT at LSS

2.1. School Overview

Lugoba secondary school (LSS) is located on the Lunga village found at Bagamoyo district on the Coast region of Tanzania. The school started its operation in the year 1989 as a mixed school of boys and girls as of to date. Currently, it has a population of 1091 students as shown on Table 1 below. Also, it has 50 teaching staffs of which 19 are women and 34 men. Currently, 20 teaching staffs are on their study leave [12].

<table>
<thead>
<tr>
<th>Forms</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>148</td>
<td>127</td>
<td>275</td>
</tr>
<tr>
<td>II</td>
<td>147</td>
<td>142</td>
<td>289</td>
</tr>
<tr>
<td>III</td>
<td>113</td>
<td>109</td>
<td>222</td>
</tr>
<tr>
<td>IV</td>
<td>73</td>
<td>104</td>
<td>177</td>
</tr>
<tr>
<td>V</td>
<td>69</td>
<td>-</td>
<td>69</td>
</tr>
<tr>
<td>VI</td>
<td>59</td>
<td>-</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td>609</td>
<td>482</td>
<td>1091</td>
</tr>
</tbody>
</table>

2.2. ICT Infrastructure

The value of Information and Communications Technology (ICT) for teaching and learning has been a point of emphasis for some time. It can be assumed that specific forms of ICT will change with time, the need to evaluate and use ICT purposefully will remain the key to full participation in an information society. There is no debate that this is the era of information technology. ICT can improve the quality of teaching, learning and management in schools [6]. We have to agree that the overall development in education sector will not be possible without ICT in the near future.

Basing on these facts, the ICT4RD project made it possible for the LSS with a vision that ICT has the ability to improve the quality of teaching and learning, sharing knowledge and information to allow easy access and availability of information at all times. The School has an ICT infrastructure from a Wi-Fi base...
station which is about 10 meters from the Wami water project house [9]. LSS is a wireless client from this base station and uses a fiber backbone network as its gateway.

The school has about 25 desktop computers, of which 20 are located in a computer room, 5 at the school administration block where the headmaster office has 1 PC, his secretary has 1 PC, and the other 3 are located in the second master’s office, the accountant office and the academic master’s office. The PC’s in the computer room have access to the internet but they have been redundant for sometimes as they seemed to be used very rarely. We employed a methodology discussed in section 1.5 so as to enable the LSS community in making use of the available ICT resources that are already in place.

We believe in ICT as a tool for improving the quality of teaching and learning, sharing knowledge and information. The following sections addresses the matter of teachers' ICT needs by building their ICT capacity for Education based on a wider context of information and technology literacy, i.e. the ability to search for, identify and critically evaluate information content and quality; select, adapt, present and communicate information to meet particular learning needs as well as raising their ICT awareness.

2.3. Awareness and ICT use

2.3.1. Awareness

The LSS community is already aware of various ICT services. They seem to know the impact of ICT in education. Despite the fact that, they are familiar with some of the ICT services yet some of them needed to be changed their mindsets with concern to ICT. Some of them were afraid of even touching the personal computers (PC) as they felt that it’s a huge thing that scared them and could not sit and make use of it. As such, we conducted an ICT awareness seminar to explain in details importance and use of ICT services for education. We thought of having this awareness creation seminar because we knew that ICT offers a way to improve and update skills including the capabilities of the teacher’s
workforce in their learning and teaching environment. On this awareness creation seminar, we explained the main objectives of our thesis, capacity building of ICT in education and set milestones in accomplishing them. The LSS community agreed to work with us as they were eager to learn and make practice of ICT services.

Figure 1: LSS teachers at awareness seminar

There have been computers at LSS for about 3 years now, but they seemed have been redundant. This may be because of lack of teacher training and lack of awareness amongst teachers of computers’ adaptability. Indeed of this, we took the initiative of providing a capacity building in ICT training courses for which LSS teachers needed the most. Their skill was boosted through this and they became interested to use the gained knowledge in their classroom teaching practice. As well as appropriate knowledge and skills, ICT "capacity building" is the need to have skills and knowledge delivered in such a way that they remain relevant over time and in different situations. Teachers are obliged by the nature of their profession to be involved in and adapt to, a variety of settings, with a variety of teaching practices and approaches, and to different roles as their career develops. These demands indicate a need for the teacher to be able to transfer and apply ICT skills. Their need to accept change will continue throughout their career due to the dynamic nature of the curriculum and the need to update and expand skills in order to develop professionally. Teachers
need to develop skills in such a way which enables them to deal with situational change, e.g. from using traditional methods of teaching using chalks and blackboards to presentation tools with a data projector in delivering their teaching content. They need to be able to cope with role change, so that they can move flexibly from their position as users of ICT as a personal learning resource to the position of teachers using ICT resources within the context of the subjects and levels they teach.

The LSS community has been able to realize the importance of ICT education. Because of their interest, we went on in giving them computer training course. On the other hand, while only a few teachers have had the opportunity to develop more than the basic skills in the use of ICT, even fewer have developed confidence and competence in the integration of ICT into their classrooms. The increased interest in ICT has now made some of them in wanting to build an IT career. The community awareness grew because ICT was so widely promoted. People became very curious and were interested to learn about computers and computing. Many of them became skilled. Because of this, the number of internet users has also increased, now they are keeping pace with the modern world through the internet.

2.3.2. LSS ICT Use

During this research, we discovered that:

• Use of ICT was relatively low and focused on a fairly narrow range. ICT was used most frequently for word-processing and this was some kind of pressure from the school administration as teachers were not allowed to write letters by hands or they sometimes queued at the secretary office to ask her for typing assistant. As, such teachers were forced to make use of the available PCs in the computer room in typing letters.

• There was very little use of the Internet and www or e-mail despite the fact that at LSS there is Internet. Also, it was reported to us there has been a misuse of internet by searching or browsing pornography sites as such the school administration had to close down the computer room for sometimes.
• There was very little or not at all the usage of ICT to support classroom practice only those who used computers (one or two teachers) at home tended to make use ICT in classroom teaching as they had an opportunity to know how to use a data projector, though this was also difficult for them as they had to incur some extra costs to get a projector from a nearby tele-centre.

• ICT was still seen as an extra or add-on rather than an integrated resource within teaching; many teachers were still not concerned ‘teaching with ICT’.

Generally, ICT use was very low because there has been little training of teachers in the implementation of ICT for teaching and learning purposes. "The teachers' attitudes could also have been a problem because of their perception that students nowadays are more technologically ahead than the teachers," said one teacher. He emphasized the need to implement the use of ICT "I knew it will take time but hopefully we can inculcate ICT culture as this will help to enhance teaching and learning." As such, we thought that there is a need of changing the teacher’s mindset on ICT usage by taking a further step in building their ICT capacity. We encouraged ICT culture through better communication, socialization and training. We came up with in-house trainings and made sure that there is better accessibility to ICT equipment as well as better Internet connectivity, as it was reported that some PC were broken down and most of them had no internet connectivity.

The overall picture which emerges from LSS teachers was a relatively positive one. A great deal of interest and motivation to learn more about the potential of ICT was acknowledged. Indeed the majority of LSS teachers currently say they make use of some computer-based resources at some time in their professional life. As shown on Table 2 below. However these results do not mean that the vast majority of teachers use ICT resources often or that they feel competent enough to use ICT as core teaching resources. In fact the majorities of teachers make very limited use of ICT, and express a strong interest and need to learn more. Word processing was the most frequent use by LSS teachers.
Interestingly, although the Internet is available in LSS, yet the level of use of www and e-mail is still relatively low. This is likely to be a lack of what many teachers would regard as ready access.

Table 2: Statistic in the current usage of Software Applications at LSS

<table>
<thead>
<tr>
<th>Software Applications</th>
<th>Not Aware</th>
<th>Little Experience</th>
<th>Occasional Usage</th>
<th>Regular User</th>
<th>Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spreadsheet-Tools</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Word-Processing Tools</td>
<td>0</td>
<td>3</td>
<td>3</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>Internet &amp; Emails</td>
<td>0</td>
<td>12</td>
<td>6</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Presentation Tools</td>
<td>0</td>
<td>15</td>
<td>7</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

When asked about ICT applications most frequently used on regular basis higher rating were given to Word-Processing tools and Spreadsheet tools i.e. Excel. These two are now widely used by teachers for work simplification. Figure 2 below shows by % the use of these applications by LSS teachers at present.
This suggested to us that, teachers needed ICT training in a wider range of these applications for them to make full use of technology in teaching like use of spreadsheets for example, allow teachers to enter the student’s examination records and easily sort them according to their performance, hence made calculations easy and saves time. This task was difficult before as they would sort the students performance manually on a piece of paper then enters them on the computer but now they can randomly enter students performance on an excel sheet and later performs the calculations and sort them accordingly. On the other hand, it appears that most of the teachers have little experience on the Internet, emails and presentation tools due to the fact that they consider these applications to be difficult for them and as such think that they require advanced skills to use them.

We have a strong opinion that providing teachers with access to computers is a key to successful training and development and encourage greater use of ICT by teachers in school. However, it cannot be assumed that providing computers for use will change attitudes towards ICT. It seems more likely that computer access provides those who are already motivated with more opportunity to develop their skills and enhance the production of materials for themselves and generally give the impression that they have a more detailed awareness of the possibilities of
ICT. Some of them talk about the positive impact of ICT on their own record keeping and administration.

While virtually no teachers think that ICT has a totally negative impact on their teaching, teachers find that ICT is "time consuming" or presents them with difficulties related to shortage of hardware/software and faults in equipment. Most of the negative responses appear to be more related to teachers' own lack of confidence than any evidence that ICT is a problem in itself. This lack of confidence is allied to their worries that they will be unable to cope if things go wrong. They seems to be worried about their ability to cope with unreliable hardware and software and also report a wider range of problems related to class or time management, their own lack of skills and confidence, and limited access. Despite these challenges, they now see ICT integration as a means of applying computer and Internet technology to enhance the quality of teaching and learning objectives. At simplest level, ICT integration has allowed for storage and display of information in a wider context at LSS. The training focused on ICT in using data and information sources, searching and selecting appropriate teaching materials, organizing, investigating, and analyzing various sources of information, to refine and present information appropriately using ICT tools. Appendix C shows an outline of what had been covered and a template for future use has been created as a quick reference for the future use. During the training periods a number of scenario interviews were also conducted with teachers to provide an in-depth understanding of the issues and the contextual factors which influence teachers' responses to ICT. The general aims were to build capacity on teachers' needs for knowledge and skills in relation to the effective use of ICT and to suggest ways of enhancing future design and delivery of self- and staff-development in order to increase and improve the level of ICT use at LSS.
We observed that lack of time often was perceived as a problem when it comes to refreshing knowledge and skills if ICT resources are used infrequently. As one teacher said: ‘What is difficult is, because I'm not using ICT services everyday (it could be three weeks that I don't use it and then I need to go and use it), I can't remember how to use it.’ We felt that investment in time is required in order learning to use ICT resources and trying to keep pace with a rapidly changing field. There is a need for staff developments in ICT to be kept up-to date since ICT development is constantly changing. The training to date has clearly created an awareness of ICT and encouraged many teachers to use ICT in the classroom; it has also left teachers feeling the need for much more support and training. Many feel they have acquired enough basic knowledge of ICT, and need progressing beyond this. They feel they have some competence to use a wide range of ICT although they also feel that they lack the kind of understanding they need to integrate ICT fully within the curriculum. As one teacher said many of us may have skills and knowledge but are not transferring these to the classroom: ‘our skills can be very good, but it's not transferred into what we are doing with the students. We have got the skills but we aren't using the skills as well as they could.’ Although this does not mean they are not using ICT in any
The ICT training offered to the LSS community has allowed access to a wealth and variety of texts, both written and aural, from electronic sources. ICT has enabled LSS teachers to produce presentations via oral feedback, a written summary or a report which may sometimes be published to a wider audience. We prioritized information, focus on accuracy, and reduce text into summary form. ICT has allowed adaption of content and style according to the ICT medium being used. The pride in the quality of product has encouraged a similar attitude in the language used; ICT has opened new opportunities for communicate with others. Messages can be quickly and easily prepared and sent soon after creation (Emails usage).

We have also, provided school teachers with practical materials, support and guidance to encourage and enable effective teaching across the curriculum using ICT. The ICT materials will be uploaded in the school’s server once it’s set-up. This will allow easy access and review as they continue to apply and make use of already deployed ICT services.

2.4. **LSS ICT practices into classrooms**

Information and communication technology (ICT) is proving that it can play an important role in teaching and learning. ICT has become a key tool in managing learning and using educational resources at LSS. The use of information and communication technology such as Internet applications and various computer attachments and software programs have caused many changes in the LSS society. These changes have not just been of a technical nature but more importantly of a structural nature. LSS teachers have acquired the confidence and skills to make use of and to integrate ICT into their lesson plans and teaching of the subjects in the classroom. However, the impact of ICT on education at LSS is just a beginning to be felt as teachers integrate this new technology into their teaching. The use of ICT at LSS is now changing teaching
in several ways. With ICT, teachers are able to create their own material and thus have more control over the material used in the classroom than they have had in the past to improve students learning. It seems that technology is requiring teachers to be more creative in customizing their own material.

During this research, the LSS teacher’s capacity building in ICT focused mostly in making them to understand computer applications such as word processing tools and presentation tools and ways to get the most out of them to advance teaching and learning. These are the main tools that teachers could use into classroom teaching. For instance, the use of Power Point presentations provides a good example of how it helps them with their teaching and has improved their presentation of teaching material to class. Teachers explained that technology has enabled them to deliver more material to students and it also eliminated several basic problems such as; poor hand writing, poor artistic skill, contrast, lighting, and visibility. Also, the use of word processing programs along with Excel to do graphs and presentations.

ICT has now been used to support learning in specific subjects such as geography, Swahili etc. ICT has allowed LSS teachers to produce and modify their teaching resources quickly and easily. It has allowed access to a wide range of information in various formats. The computers have made the teaching process more effective and sometimes fun for the students. Also, using Web pages to enhance an activity demonstrates that technology can be used to complement other aspects of good teaching rather than replace them. As one teacher geography said, ‘Today my class got to understood the subject much better as I could show them in a simulation how the earth spines and students were interested and said we real got something real’.

ICT usage, now supports learning and teachings including guidance on how teachers can make use of the internet, in which most of them can search resources by their subject areas, and so use them to pass on inspiring ideas to their students and other teaching staff. The resources available improve access and make learning more inclusive and easy delivery of the lessons.
The use of information technology has also changed school administration in several ways. One teacher explained that when she started teaching six years ago, it was not expected that teachers know how to type their own test. Now teachers know how to use word processors and have their tests done in a proper format. Several teachers noted that there is a move toward recording grades and attendance electronically by the use of Excel. Teachers can now, check their e-mail, and even think that lot of things such as information of staff meetings could be done via e-mail as long as the internet connection is reliable and available. E-mail has become an important communication tool as it keeps them in touch with each other.

The changes caused by the introduction of information technology into learning environments, are not without some potential problems which must be considered by school administration. The information at LSS indicates that some fundamental rethinking of the education process may be necessary because of the use of ICT. This will also put pressure on the school system to restructure the way education is organized if they are to make use of the ICT tools.

In reality at LSS, the number of activities and resources available to teachers is truly vast, like a data projector which could be a useful tool for teaching a large class of students. However, if the few resources that are available are used appropriately ICT can dramatically improve achievement levels, inspire creative thinking and encourage the development of skills that will prove invaluable in the real world. ICT can save teacher’s time and inspire students to learn.

**2.5. ICT Attitudes, Skills and Capability**

**2.5.1. Attitudes**

Teachers' attitudes towards ICT were investigated in this research by means of a series of statements to which teachers indicated their agreement or disagreement. As might be expected, there is a significant correspondence between levels of use of ICT and teachers' attitudes. Those who are more inclined to identify the positive benefits to them (e.g. making their work easier,
saving time, improving communication with colleagues, finding more information or managing information more effectively, acquiring new knowledge) tend to use ICT more. Those, for whom the problems and worries they encounter appear to outweigh the potential benefits, tend to use ICT less often.

The LSS teacher’s attitudes toward ICT vary and most of them have fixed feelings (as observed from conducted interviews). Majority of them are interested in developing their ICT skills and knowledge while some of them feel overwhelmed with the development. They worry about the pace of development, feeling that they cannot cope with terminologies associated with computers and worry about their own lack of skills and knowledge. 'I need to keep up with ICT developments. It’s fast growing aspect of education’ as one teacher said. We also observed that, negative attitudes from some of the teachers were associated with awareness of the difficulties they have to overcome in order to be able to use ICT effectively. They are caught up with resistance to learning about computers because they perceive it to be too difficult. As one teacher said, 'I think everybody is aware of the potential benefits of ICT in education but also a bit worried about using it. Some are quit happy to say that ‘I’ve never used it and I don’t want to use it, I’m quite happy with blackboards and chalks that’s it’.

On the other hand, most of them now, seemed to be more comfortable with ICT and are inclined to find it helpful in a variety of planning and management tasks. They seem to be committed and interested in developing the use of ICT and likely able to cope and continue to develop. It may be the case that encouraging teachers to have their own computers for use at home will allow those who are already motivated to develop their skills further, and will provide them with the time and opportunity to build ICT into their curriculum activities. While having access to a computer for home use seems unlikely to change attitudes amongst those who are less motivated, it may help enthusing them more and generally more convinced of the potential benefit to themselves and their students at large.
2.5.2. ICT Skills and Capability

Turning to teachers’ perceptions of their own abilities, levels of ICT competence (capacity) amongst LSS teachers is high. We observed this during the interviews and the filled questionnaires; more teachers feel themselves to be competent in the personal use of ICT. However given the worries they express about their ability to cope with ICT it would appear that they do not generally consider themselves to be competent enough to teach effectively with ICT.

<table>
<thead>
<tr>
<th></th>
<th>Classroom practice</th>
<th>Professional development</th>
<th>Personal Use</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very competent</td>
<td>-</td>
<td>1</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Competent</td>
<td>5</td>
<td>2</td>
<td>24</td>
<td>2</td>
</tr>
<tr>
<td>Not competent</td>
<td>22</td>
<td>15</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Don’t know</td>
<td>1</td>
<td>10</td>
<td>1</td>
<td>-</td>
</tr>
</tbody>
</table>

We shaped a foundation that has built and increased teacher’s knowledge and competence in basic software applications and general knowledge of Information and Communication Technology in the education era. Successful implementation of the ICT services has provided and will continue to provide great opportunities for teachers to apply and develop their ICT capability in their different subjects. Subject areas can build on and exploit teachers’ ICT capability to enhance teaching and learning in their respective subjects.

2.6. Keeping up-to-date with ICT

Keeping ahead in information and communication technologies (ICT) in education does not only means keeping up to date with rapidly changing technologies. It also means successfully using these new technologies in teaching and learning in which teachers play a major part. In addition to formal and informal trainings, it is a mark that teachers are able to continue in keeping up-to-date with new developments of ICT in their field. Nowhere is this true than in the rapidly changing world of ICT. Some teachers would rely on other colleagues who are better on ICT knowledge. Also, we think that, ICT technicians
could be the major source of ICT knowledge with keeping up-to-date with ICT developments to LSS teachers. The ICT technician could give up time to train LSS teachers on different aspects of computer technology. So many teachers could see a need to learn more, but they are afraid that more ICT training may not be available in the near future as such they suggest that an ICT technician to be available within the school and help them to keep up to date with the ICT development.

Teachers need to be aware of a broader range of ICT than they are at present using, without this awareness, many feel they cannot assess their own ICT development needs. They need technical skills and knowledge in using the ICT resources they have available to them; but they also want to know more about how to apply that knowledge within the curriculum. Teachers express a need for training in relation to their professional development, to help them keep up to date with teaching and learning using ICT. More ICT training is their main priority but they also need to remember that the potential of the new ICT for improving learning and teaching will not be realized unless teachers are well retrained in the pedagogical use of technology in the classroom.
Part II

3. Challenges

Progress in using ICT to improve teaching and learning is sometimes limited because its use may not sufficiently be considered when planning the work or because of individual teachers’ lack of understanding of when and where ICT might make a difference. Sometimes it is because a teacher simply does not know how to use a particular piece of equipment or software.

Also, lack of colleagues with ICT specialist knowledge, a computing department and ICT technicians seems to be the biggest challenge at LSS. However, in order for this kind of support to be appropriate and useful, ICT technicians need to be available to give teachers support whenever they need as they would be kept up to date with ICT developments. The ICT technicians could provide the kind of localized support they need in order to put into practice ICT capacity, skills and knowledge they have built. It will be important that these groups of staff continue to develop their own ICT skills and knowledge.

A number of problems and issues emerged from our research regarding teachers’ use of ICT, the lack of access to, or problems with the availability of hardware or software, and users’ own lack of familiarity, skills and knowledge. To generalize, the following seems to be the major challenges at LSS that we found during this research:

- Lack of constant availability of some ICT resources (such as Internet, e-mail, on-line information sources) was the main reason given by most teachers. This should not necessarily be taken to mean that there might not be other inhibitive factors such as lack of knowledge or skills, or lack of support, but rather that access to the technology tends to override all other factors in determining use.
- Scarce resources for instance data projector which could be used to serve a large class of students instead of dividing them in different groups.
- Teachers' Time. Teachers stated that information technology was placing more demands on their time. Teachers noted that extra time was needed
to learn the application softwares and also to create new things for teaching because greater expectations were being placed on them.

- Lack of ICT technical support and advice on selecting appropriate ICT resources to use.
- Maintenances of the equipment once there is a break-down could take a long time and may lead to discouragement if not done on time. Hence, this raises a need of having an ICT technician within the school.

While it cannot be assumed that if teachers had greater access to, or were more familiar with, a broader range of ICT they would tend to use it, it is clear from their responses that many teachers are currently may not be in a position to make informed judgments about the suitability of a wide range of ICT.
4. Recommendations

Information and communication technologies (ICT) on their own will not bring about improvements in educational quality, but when we change our mindsets to use them reflectively and strategically, teaching and learning processes can be deepened.

To enhance the ICT needs and its future at LSS we recommend the following:

• LSS should employ a good physical infrastructure and technical support that will make ICT accessible and useful should be sustainable to students, teachers, administrators and supporting staff.
• LSS should consider of having ICT staff development plan in which various ICT actions are planned to be achieved.
• To develop more and stronger competence among teachers in using technology, in designing, producing and using ICT-based instructional materials.
• To ensure that there is always access to the latest developments in ICT and to support research and development in this area.
• The school should consider of having an ICT departments having an ICT coordinator, he/she could be among the teachers with experience in ICT matters to bring about excellent ICT knowledge and its updates. He needs to show a clear understandings and areas for developments of ICT. His responsibilities also could include monitoring the quality of planning for ICT and, through observation of lessons, the quality of teaching and learning.
• The government should undertake a curriculum improvement programme focused on the integration of ICT into education.
• The government should take part in promoting the use of appropriate and innovative technologies in education and training.
Part IV

5. Conclusion and Future Works

5.1. Conclusion

The LSS community has realized the importance of ICT in education. The motivational role of ICT in learning has also been widely recognized. How well prospective teachers learn to use ICT will profoundly influence their effectiveness as future educators. LSS teachers encountered during this study are motivated and interested in developing ICT skills and knowledge, primarily because they feel that ICT has much to offer them. However, the provision of a localized, supportive environment which encourages teachers to see ICT as integral to the achievement of their existing goals is likely to be as important as any major training initiative.

During this research the following objectives were archived:

- Awareness trainings and workshops were conducted to a group of teachers and school administrators to build their capacity and equip them with knowledge, understanding and skills on the use of ICT for education.

- Raising teachers computer literacy by providing them with basic skills on computer which include, the general information of computer fundamentals such as what is a computer, its components, getting started etc., introduction and usage of software applications word-processing, spreadsheets and presentation tools for their daily classroom operations. Files/Folders management for the storage and sharing of information.

- Making sure that ICT usage focuses on their teaching need by choosing appropriate applications for their education plans. For example, usage of spreadsheets- MS Excel for examinations and tests calculations for all students.

- Enabling them to judge on when and how they can integrate ICT into their classroom. For example, making use a data projector for delivering lectures to a large number of students/big class.
• Gaining teachers confidence and skills on how they should apply ICT in making their lessons plans and integrating ICT into with their subjects in the classrooms.

• Training them on how Internet works, using different search engines such as Google, yahoo etc. to search for information related to their teaching subjects, emails sending and receiving.

• Stimulation on the usage of VoIP services through the already installed IP phones to facilitate the ease of communication among them from one office location to another.

5.2. Future work

The following are proposed actions that can be done to further improve the current situation of ICT at LSS and making the ICT4RD project more fruitfully:

• Locally a stable website and mail services could be created, with local administration to allow easy and postage of LSS information.

• LSS should consider of having a computing department that will take care of all related ICT initiatives.

• LSS should take into account the expansion of the computer room so as to accommodate a larger number of users as possible.

• LSS should think of familiarizing students with the use and workings with computers, and related social and ethical issues.

• ICT should be considered as a tool to enable students’ learning through simulation games; this enables active learning through all senses.
Part V

6. References, Abbreviations and Appendixes

6.1. References


10. Interview with the LSS head-teacher at Lunga, Lugoba Village.
6.2. Appendix A - Questionnaire

The purpose of this questionnaire is to help us in getting feedback on our research "Capacity Building of ICT in Education for Rural Areas: a case of Lugoba Secondary School". We would like you to answer some questions about how you use the technology that has been introduced in your area by the ICT4RD project focusing on ICT training and its usage. All the information will be held in strictest confidence. Thank you for your time and participation.

PART I: Respondent Information

Full Name: ................................................. Occupation: ..............................

Sex: [ ] Male [ ] Female

PART II: General ICT knowledge and skills

Please circle your level of confidence along a scale of 1 – 5
1. Not aware 2. Little experience 3. Occasional usage 4. Regular user 5. Confident and could explain function to others
As well as answering please also tick the box headed NR if the task is Not Relevant to you

<table>
<thead>
<tr>
<th>Computer Skills in Hardware/Management</th>
<th>NR</th>
</tr>
</thead>
<tbody>
<tr>
<td>• connect up the computer and its peripherals</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• locate and run a programme (software application)</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• use CD-ROM-based software</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• organise your electronic files into folders</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• search for files on the computer system</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• move / copy files between drives (e.g. from A: to C:)</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• backup files onto various media types (floppy, CD-RW, USB flash disks etc)</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• printing documents</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• use a scanner for copying images</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• use a data projector</td>
<td>1 2 3 4 5 □</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Word Processing</th>
<th>NR</th>
</tr>
</thead>
<tbody>
<tr>
<td>• use simple editing e.g. bold, italics, centering, font size etc</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• use a spellchecker</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• import text and images into a word processed document</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• include tables in a document</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• create new document templates</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• use headers and footers</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• save a document in various file formats including ppt/HTML</td>
<td>1 2 3 4 5 □</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spreadsheets</th>
<th>NR</th>
</tr>
</thead>
<tbody>
<tr>
<td>• input data in rows and columns</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• auto filling series</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• sort data</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• input formulae</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• replicate formulae along rows/columns</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• produce charts and graphs for data analysis</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• add headers and footers</td>
<td>1 2 3 4 5 □</td>
</tr>
<tr>
<td>• print a selected area</td>
<td>1 2 3 4 5 □</td>
</tr>
</tbody>
</table>
• understand and use relative and absolute cell-referencing  
  
• display/hide formulae  

**Presentation**

• create a basic presentation  
• modify colors of text, lines and spaces on a slide  
• introduce animation onto slides  
• modify transition between slides  
• edit a master slide  
• incorporate a data chart or graph  
• rearrange slides within a presentation  
• produce appropriate handout formats  

**Using the Internet**

• access an Internet site via its website address  
• use search engines to find information  
• use bookmarks / favorites for marking sites  
• download files from the internet  
• save text and images from web pages  

**E-mail**

• send and receive e-mail messages  
• attach files to outgoing e-mails  
• open and save files attached to incoming e-mails  
• forward emails to selected contacts  
• create new contacts in address book  
• create a distribution list of contacts  
• sort messages and file in created folders  

---

**PART III: ICT Curriculum Planning and Delivery**

**Lesson Planning**

• understand advantages and disadvantages of ICT  
• compare different software packages for a specific purpose  
• research for teaching material using CD-ROM or the Internet  
• prepare handouts using PowerPoint  
• use graphical images in lesson preparation  

**Teaching and Delivery**

• teach ICT skills to students  
• extend students learning in a subject using ICT  
• provide a list of relevant websites for topic areas  
• use a data projector for content delivery  
• include internet sites in learning activities  
• use the Wikipedia/Moodle to publish support materials for lessons, lecture notes and handouts in your school server
Do you have access to the following technologies for administering and delivering the curriculum?

<table>
<thead>
<tr>
<th>Technology</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff room computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internet access</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office software (Word, Excel, Access, PowerPoint)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transparencies for printer/copier</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scanner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CD writer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data projector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scanner</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PART IV. Your views on ICT

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I'd like to know more about ICT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computers scare me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT helps me find heaps of relevant information for my teaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I know the basics of ICT but that is all.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don't know what I would do without it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I manage information more effectively because of ICT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I find it helpful for non-work related tasks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I find using ICT time consuming.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It makes my work easier.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I prefer using it on my own when no-one is around to see me make mistakes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>It cuts down my preparation time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I find it easy to select appropriate ICT resources for my teaching.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can't cope with all the ICT terminology.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel supported in my use of ICT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT helps me communicate with colleagues.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systems are slow, wastage of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I feel lost in the information age.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I don't have the appropriate skills to use it effectively.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How would you describe your level of ICT competence in the following context?

<table>
<thead>
<tr>
<th>Level</th>
<th>Classroom practice</th>
<th>Professional development</th>
<th>Personal Use</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very competent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not competent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don't know</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PART V. ANY OTHER COMMENTS

1. What do you think are the obstacles that hinder the adoption of the ICT use in Lugoba Secondary School with perceptions to Education?
2. Please use this space for any additional comments (e.g. what you feel would encourage your use of ICT in the rural areas with regard to *Education* anything you feel discourages you from using ICT).

### 6.3. Appendix B – LSS Head Teacher Response Sheet

**Master thesis titled: Capacity Building of ICT for Education in Rural Areas: a case study for Lugoba Secondary School**

Dear Sir/Madam,

It is important for us to get a whole school view of ICT use and priorities for the development of teachers' skills. This will help us to identify the issues which schools consider important in making the best use of ICT for Education.

Thank you in anticipation of your co-operation in this project.

**Notes**

For the purposes of this response sheet we interpret ICT (Information and Communications Technology) to mean: *Any computer based and communication technologies, networked and standalone, including both hardware and software, which can be used as teaching, learning and information resources.*

Please indicate whether you agree or disagree with the following statements relating to your school. Please, tick on appropriate check box.
<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>This school encourages the use of ICT by all teachers</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Recently qualified teachers in this school are in touch with ICT</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This school emphasizes the use of ICT only when it is appropriate to the curriculum</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This school encourages teachers to go on ICT related staff development courses</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Teachers in this school generally prefer to use non-ICT based resources</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Most teachers in this school are comfortable with ICT</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This school cannot afford to invest in ICT resources - even though we would like to</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This school encourages the use of ICT across the curriculum</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Informal networks help this school keep up to date with ICT</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Generally, teachers in this school do not have the time to become familiar with ICT resources</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>ICT is not likely to further enhance teaching in this school</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>ICT floods this school with too much information</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>My education authority is very supportive of ICT initiatives/purchases</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>This school is not yet ready for ICT</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>I feel pressurized to develop ICT use in the school</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Teachers are encouraged to make as much, or as little use of ICT as they see fit</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The school intends to put more money into ICT over the next few years</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>ICT is the way forward for effective teaching and learning</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>ICT enhances this school's ability to manage information effectively</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

2. Does your school have any School Policy on ICT?

   Yes ☐       No ☐
3. Does your School Development Plan have specified targets for ICT?

   Yes ☐       No ☐

4. What is your main priority for developing teachers' ICT knowledge and skills? (Please give details)
5. Please use the space below for any additional comments.

6.4. Appendix C — Capacity Building Template Outlines

The following are the basics ICT resources that will be included in a template to be delivered at LSS as a quick reference user manual:

1) Computer Skills in Hardware/Management
   - Connecting up the computer and its peripherals
   - Files/Folder creation and organization
   - Searching and Locating Files
   - Locating and running a programme (software application)
   - Moving/Copying files between various drives (e.g. from A: to C: )
   - Backing up files onto various media types

2) Word-Processing Tools — MS Word 2003

Getting started
   - opening a word application
   - creating and saving a word document
   - closing the word document

Basic Operations
   - adding text
   - using a spellchecker
   - including tables in a document
   - importing text and images into a document
   - saving a word document into various formats such as ppt
   - printing

Formatting
   - Using formatting tools such as bold, italics etc.
   - Document set-up
   - Adding headers and footers
3) Spreadsheet Tools – MS Excel 2003

Getting started
- opening a spreadsheet application
- creating and saving a spreadsheet
- closing the spreadsheet

Basic Operations
- Inserting data in rows and columns
- Selecting data
- Copy, move and delete data
- Searching and replacing data
- Rows and columns, sorting data
- Cell referencing
- printing

Formulas and Functions
- Display/hiding formulae
- Using the sum and average functions
- Using the IF functions etc.

Formatting
- Formatting cells with numbers, text
- Document set-up
- Adding headers and footers
- Charts and graphs for data analysis

4) Presentation Tools – MS PowerPoint 2003

Getting started
- opening a ppt application
- creating and saving ppt
- closing the ppt

Basic Operations
- creating a presentation
- choosing of appropriate automatic slide layout
- modifying text colors, lines and spaces on slide
- Adding text, images etc.
- copy, move, delete – slides, text, images
- printing

Formatting
- Format text, bold, italics, underlining
- Modifying text boxes
- Graphics and chart insertion
- Rearrange slides for presentation
- Producing handouts formats etc.

Slide show effects
- inserting animations
- slide transitions
- viewing slides

5) Internet and emails

Getting Started
- opening a web browser application
- understanding the make up and structure of a web address
- displaying a web page
- changing web browser home page etc

Web navigation
- accessing internet sites via web address
- web searching using search engines to find information
- bookmarks/favorites for marking sites
- downloading files from the internet
- saving text and images from web pages

Electronic mails
- opening a particular email application
- opening of mail boxes
- sending and receiving e-mail messages
- copy, move, delete mail messages
- reading mails, replying mails, attaching files
- forwarding e-mails
- using address book for adding, deleting, updating addresses