iKnowledge (Tanzania) M&E Baseline Report

March 2016

iKnowledge (Tanzania)
MONITORING AND EVALUATION
BASELINE REPORT

Joanna Waddington
March 2016
## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acronyms</td>
<td>3</td>
</tr>
<tr>
<td>1. EXECUTIVE SUMMARY</td>
<td>4</td>
</tr>
<tr>
<td>2. INTRODUCTION</td>
<td>7</td>
</tr>
<tr>
<td>3. SUMMARY OF BASELINE PROCESS</td>
<td>10</td>
</tr>
<tr>
<td>4. BASELINE METHODOLOGY</td>
<td>11</td>
</tr>
<tr>
<td>5. BASELINE FINDINGS</td>
<td>15</td>
</tr>
<tr>
<td>6. CONCLUSION</td>
<td>38</td>
</tr>
</tbody>
</table>
**ACRONYMS**

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDO</td>
<td>Community Development Officer</td>
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<tr>
<td>DC</td>
<td>Data Collectors</td>
</tr>
<tr>
<td>DEO</td>
<td>District Education Officer</td>
</tr>
<tr>
<td>FGD</td>
<td>Focus Group Discussion</td>
</tr>
<tr>
<td>HDC</td>
<td>Head Data Collectors</td>
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<td>ICT</td>
<td>Information and Communications Technology</td>
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<tr>
<td>IDI</td>
<td>International Development Index</td>
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<tr>
<td>ITU</td>
<td>International Telecommunications Union</td>
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<tr>
<td>KAP</td>
<td>Knowledge, Attitudes and Practices</td>
</tr>
<tr>
<td>KII</td>
<td>Key Informant Interview</td>
</tr>
<tr>
<td>LCC</td>
<td>Least Connected Countries</td>
</tr>
<tr>
<td>LDC</td>
<td>Least Developed Countries</td>
</tr>
<tr>
<td>MoEVT</td>
<td>Ministry of Education and Vocational Training</td>
</tr>
<tr>
<td>ODK</td>
<td>Open Data Kit</td>
</tr>
<tr>
<td>OUT</td>
<td>Open University of Tanzania</td>
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<tr>
<td>PEDP</td>
<td>Primary Education Development Programme</td>
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<tr>
<td>PSLE</td>
<td>Primary School Leaving Examination</td>
</tr>
<tr>
<td>TEA</td>
<td>Tanzanian Education Authority</td>
</tr>
<tr>
<td>UCSAF</td>
<td>The Tanzania Universal Communications Service Access Fund</td>
</tr>
<tr>
<td>URT</td>
<td>United Republic of Tanzania</td>
</tr>
<tr>
<td>WEO</td>
<td>Ward Executive Officer</td>
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</table>
1. EXECUTIVE SUMMARY

This study aims to provide baseline information on the current situation in relation to ICT context, knowledge, attitudes and practices in 5 regions of Tanzania, targeting the views of Secondary and Primary schools teachers and students and to a lesser degree local stakeholders, government sectors and community members.

The purpose of the baseline study is to provide a contextual starting point upon which the iKnowledge project outputs and outcomes can be measured. The baseline attempts to draw on the perceptions of teachers, students and community members on computer usage and internet connectivity. In addition, it identifies current ICT practices in schools, amongst teachers and students. Using a mixture of quantitative and qualitative data, the study evidences the variances in usage and attitude, largely dependent on whether teachers have had access to ICT training. Quantitative data is taken from the views of those teachers who on the whole, have had some training or exposure to computers and / or the internet. In comparison, randomly selected teachers involved in discussions provide the views of those with little or no access to ICT.

The sites and schools were preselected for the study using criteria inclusive of (but not exclusive to) a proportionally high level of trained ICT teachers, the availability of computer equipment in schools and high teacher SMART phone usage. Thus selected schools are not representative of all schools in Tanzania – as they represent the schools with the necessary basic infrastructure to uptake and sustain the project.

Findings indicate that there is a high propensity amongst teachers to use the Internet, both for personal and teaching use, if and when they have the appropriate ICT skills, equipment and connectivity. Even without available Internet in these schools, teachers are taking the initiative to use their SMART phones and / or connect through their own modems at their own cost, in order to access teaching materials and social websites on the Internet. Teacher skills on how to use the Internet are however lacking, knowledge on how to navigate and use educational portals as teaching resources is very low. There is a distinct lack of teacher confidence to use the Internet in their teaching methodologies and the most common form of integrating information from the Internet in their teaching is through the download and print format.

There are overwhelming mitigating cultural taboos and fears around the use of the Internet, particularly amongst students (both Secondary and Primary) and the community. These fears are deep rooted and expose an entrenched negative perception of the Internet, creating barriers, which urgently need to be addressed through education and awareness in schools and the community.
The iKnowledge project is based on the following contextual assumptions and it is upon these that the project’s baseline and monitoring and evaluation has been designed, in order to measure any changes during and post the project period.

### Key Indicators

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Summary of Baseline Findings</th>
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</table>
| Lack of resources and ICT infrastructure in schools | - 60% of selected schools had computers prior to project  
- 99% of schools had electricity with 86% grid and an average of 1.5 days lost per week due to power outage  
- Key challenges to using ICT include; high cost, poor connectivity, lack of infrastructure and resources  
- 30% of teachers interviewed access the internet on a computer at school, mainly via a router (72%)  
- No school had broadband internet (prerequisite)  
- 10 out of 50 schools had computers in classrooms, the majority had computers in staff room or office |
| Lack of digital educational content available and in local language | - There were no specific educational portals available in schools. Teachers accessed educational materials in English through search engines e.g. Wikipedia  
- Lack of educational materials in Kiswahili is noted as a key barrier to accessing resources on line. |
| Lack of qualified teachers (including ICT) | - 69% of Primary school teachers have the minimum qualifications required for teaching (Secondary Level Form 4)  
- 70% of Secondary school teachers have a Higher Degree qualification  
- 71% of teachers interviewed had ICT training (prerequisite)  
- Approximately 30% of randomly sampled teachers had minimal ICT training |
| Lack of capacity to utilize ICT | - The majority of all teachers (approximately 70%) feel ill equipped to use computers and the internet in their teaching  
- 100% stated that ICT would enhance their teaching capacity and the academic performance of students |
| Lack of understanding of potential benefits of ICT | - Key barriers include; cultural taboos and fear, lack of awareness and education in the community on potential of ICT |
iKnowledge Monitoring and Evaluation - Next steps

Monitoring and Evaluation of the project will continue over the next four months and will include school observation visits to identify changes in teacher methodologies, adoption of ICT practices and usage of educational portals as teaching resources and student participation in ICT as a learning process.

A follow up study will take place in June 2016, using similar methodologies and scope as the baseline. It will provide analysis on any changes in teacher and student knowledge, attitudes and practices towards ICT in schools. The study will specifically focus on the project’s outputs and learning outcomes in relation to the intended Theory of Change. In addition, the study will assess the long term sustainability of the project, changing attitudes amongst community members and the commitment and willingness of implementing partners to continue to support the project, and their role in its expansion to other areas of Tanzania in the future. The study will provide detailed insight into the project’s impacts, both positive and negative so as to inform further programming.
2. INTRODUCTION

The Internet has emerged as the world’s pre-eminent communications infrastructure, increasingly essential to economic, social and political activity.

According to the International Telecommunications Union (ITU)\(^1\) in 2015, 3.2 billion of the world’s 7.3 billion people will use the Internet on a regular basis, however 4.3 billion people globally are not connected to the Internet regularly. Tanzania is positioned at 152/166 on the global ICT Development Index (IDI) one of 42 of the Least Connected Countries (LCC) in the world. Studies suggest that this has a direct correlation with Least Developed Countries (LDC) in respect of low educational levels, literacy, poor infrastructure and limited or lack of electricity. There is increasing global pressure to focus policy attention to connect more people in LCC regions. Tanzania is not only behind in its communications infrastructure in relation to socio economic potential, it is also lagging behind in utilising this potential in the education sector, a sector well understood and realised in developed countries.

The Government of Tanzania Education Sector Review 2011 revealed that there are many challenges facing the sector which include, the acquisition and supply of ICT infrastructure and equipment in schools, the training of teachers and children and the delivery of online teaching resources to support learning. Low levels of teacher ICT qualifications, poor infrastructure (power, equipment, connectivity) compound all ready existing insufficient teaching and learning environments in the majority of Tanzania’s Secondary and Primary schools.

The Government of Tanzania has put in place a number of policies, guidelines and initiatives to address the issue including i) the National ICT Policy of 2003 which recognizes the role ICT can play to ‘enhance education’ ii) the ICT Policy for Basic Education (2007)\(^2\), resulting in an ICT guideline for system wide ICT integration in basic education iii) “Tanzania Beyond Tomorrow” an MoEVT strategy to define an E-Education Program for Basic Education for 2011-2020 iv) The MoEVT Framework for ICT Use in Teacher Professional Development in Tanzania (2009) and v) the MOEVT TDev21 in 2011,\(^3\) which aims to build teacher capacity in Sub Saharan Africa for effective use of technology, particularly ICT, in education.

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1 ITU Measuring the Information Society


3 The Tanzania Ministry of Education and Vocational Training (MoEVT) Teacher Development for the 21st Century (TDev21) pilot, World Bank and GESCI Initiative
In line with these Government policies and guidelines, the iKnowledge project aims to transform education through the availability and use of ICT, together with strengthening the skills of teachers, thereby improving education and learning outcomes for Tanzanian school children.

Supported by UK Space Agency, and delivered through local and international partners including Avanti Communications Ltd, Camara Education Ltd, Infinity Africa Ltd, Ministry of Education and Vocational Training (MoEVT), Tanzania Universal Communications Service Access Fund (UCSAF) and Tanzanian Education Authority (TEA) the iKnowledge project is founded on the following Theory of Change.

Theory of Change:

“Transforming education through the availability & use of Information & Communication Technology together with strengthening the skills of teachers, improves education & learning outcomes for Tanzanian children and employment opportunities for Adults”.

<table>
<thead>
<tr>
<th>Context (problems)</th>
<th>Activities / inputs</th>
<th>Outputs</th>
<th>Outcome</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of resources for teaching</td>
<td>Deploy internet access and ICT equipment in schools</td>
<td>Improved ICT literacy of school teachers</td>
<td>Sustainable level of ICT literacy for school teachers</td>
<td>Improved teaching quality in rural / remote schools</td>
</tr>
<tr>
<td>Lack of ICT infrastructure in schools</td>
<td>Undertake ICT teacher training, leadership training and train the trainers in schools</td>
<td>Schools use internet, content and learning platform for teaching</td>
<td>Sufficient revenue generated through the school ICT network</td>
<td>Quality teachers encouraged to stay in rural schools</td>
</tr>
<tr>
<td>Lack of digital educational content in local language for teaching</td>
<td>Implement content portal, aggregate and translate into local language educational content for lesson planning, teaching and skill-building</td>
<td>Community using internet access through Hotspots</td>
<td>Decision makers (government and funders) are convinced of the benefits of the programme</td>
<td>MoEVT more able to fill teaching positions in rural schools</td>
</tr>
<tr>
<td>Lack of qualified teachers in rural schools</td>
<td>Deploy WiFi community hotspots in schools</td>
<td></td>
<td></td>
<td>Pilot extended to other African Countries</td>
</tr>
<tr>
<td>Lack of capacity to utilise ICT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of understanding regarding the benefits of ICT in teaching</td>
<td></td>
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</tbody>
</table>

Lack of digital educational content in local language for teaching
Lack of qualified teachers in rural schools
Lack of capacity to utilise ICT
Lack of understanding regarding the benefits of ICT in teaching

Implement content portal, aggregate and translate into local language educational content for lesson planning, teaching and skill-building
Deploy WiFi community hotspots in schools
Deploy internet access and ICT equipment in schools
Undertake ICT teacher training, leadership training and train the trainers in schools

Improved ICT literacy of school teachers
Sustainable level of ICT literacy for school teachers
Schools use internet, content and learning platform for teaching
Community using internet access through Hotspots

Improved teaching quality in rural / remote schools
Quality teachers encouraged to stay in rural schools
MoEVT more able to fill teaching positions in rural schools
Pilot extended to other African Countries

Improved educational outcomes for students
The project focuses on six core areas for improvement in 25 regions of Tanzania, namely the lack of i) teaching resources ii) ICT infrastructure in schools iii) digital educational content to support teaching iv) qualified teachers in rural schools v) capacity to utilise ICT and vi) understanding regarding the benefits of ICT in teaching.

The Project Goal, Outcomes and Outcome indicators are summarized below

**Project Goal** - To sustain, quality educational services & opportunity through integrated ICT provision in schools and communities in selected regions of Tanzania

<table>
<thead>
<tr>
<th>OUTCOMES</th>
<th>OUTCOME INDICATORS</th>
</tr>
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</table>
| **ONE:** Increased and sustained ICT service provision through local partnership and satellite services in Tanzania | • % of service providers providing effective services  
• % of service providers able to sustain effective services  
• % of service providers/ partners who are committed to and believe the project has countrywide educational and business potential |
| **TWO:** Increased teacher competence to integrate internet based ICT’s in their teaching and learning practices | • % of teachers integrating iKnowledge in their teaching  
• % Teachers delivering ICT training to others  
• % Teachers / Students with positive attitude towards ICT and its potential as a teaching/ learning resource |
| **THREE:** Increased local capacity and will to sustain services          | • % iKnowledge schools sustaining ICT activities  
• % Population using ICT  
• % Population who value ICT and its potential |

Through the installation of satellite connectivity and provision of laptops in schools, facilitating capacity building through the training of teachers and trainers of trainers in ICT skills and the implementation of educational content portals in schools will result in increased ICT integration in Primary and Secondary schools including connectivity, skills and content development and sustainable solutions to service provision and opportunity.
3. SUMMARY OF BASELINE PROCESS

This section provides a summary of the study process and its key elements.

3.1 Project Planning - conducted in collaboration with iKnowledge partners and involved:

- Development of the log frame
- Development of study site selection criteria
- Development of M&E timeframe
- Development of the study design and methodologies

3.2 Identification of study sites and scope

3.3 Data Collection tools development

- Detailed School Questionnaire
- Detailed Teacher Questionnaire Surveys
- Focus Group Discussion guiding questions
- Key Informant Questionnaires

3.4 Data Collection identification and training

- Development of data collectors job description and required skills
- Advertisement of positions and selection of candidates for interview
- Interview of 14 candidates and selection of 8 data collectors and 2 head data collectors
- Training 10 data collectors for 5 days

3.5 Pilot and review of tools

- Pilot of 20 questionnaires in the field
- Review of piloted questionnaires and edit of tools

3.6 Data Collection

3.7 Data Analysis

3.8 Desk Review

3.9 Report Writing
4. BASELINE METHODOLOGY

This section provides details of the study scope, school and respondents selection process, design, study instruments, data entry, quality control and analysis processes.

4.1 BASELINE SCOPE

The baseline monitoring and evaluation of the iKnowledge project took place in 5 out of the 25 programme regions aimed to reach 1,450 respondents from the following target groups from each region:

**Secondary Schools (6)**

60 Students in FGD (10 per school)
30 Teacher Questionnaires (5 per school)
60 Teacher in FGD (10 in 1 FGD per school)
6 Head Teachers KII (1 per school)

**Primary Schools (4 – 1 Academy 3 Teaching labs)**

40 Students in FGD (10 per school)
20 Teacher Questionnaires (5 per school)
40 Teacher in FGD (10 in 1 FGD per school)
4 Head Teachers KII (1 per school)

**Government and local administration**

25 DEO/WEO/CDO, Doctors, Nurses, Police, Board members

**Community members**

10 Community members including leaders, youth, business people, women, farmers

Study Group Actual Total: 1,465
- Secondary School Students: 300
- Primary School Students: 200
- Secondary School Teachers: 511
- Primary School Teachers: 329
- Head Teachers: 50
- Local Administration: 25
- Community Members: 50
4.2 SITES, SCHOOL AND RESPONDENTS SELECTION

4.2.1 Sites – Baseline study sites were selected from the project selected sites to represent different regions of the country based on their geographical location, connectivity and accessibility and a proportional balance of rural and urban schools. The 25 regions (sites) prioritised for the iKnowledge project were selected based on:
- A balance of rural and urban schools within the catchment area
- A high business density
- High use of mobile money within the locality

The 5 regions selected for the Monitoring and Evaluation of the project were:
- Arusha Region, Arusha Municipal and Arusha District Council
- Kilimanjaro Region, Moshi Rural District
- Tanga Region, Korogwe District
- Morogoro Region, Morogoro District
- Iringa Region, Mufindi District

4.2.2 Schools – Baseline study schools - were the previously selected schools (against the below criteria) within the selected region. 50 Schools were selected based on the following:
- Gender balance
- Population size (high) /Class size (small)
- Availability of ICT trained teachers
- Reliable power source and Good security
- Availability of room for ICT laboratory
- Internet access (none)
- Teachers ownership of SMART phones (high)

4.2.3 Respondent Selection - i) teachers and head teachers strategically selected for quantitative interviews and ii) randomly selected teachers, children, community members and stakeholders for qualitative data through KII and FGD.

Head Teachers: 50 for detailed quantitative questionnaire on school context
Teachers: 340 for detailed quantitative questionnaire strategically selected teachers with ICT skills or basic knowledge (50% male 50% female)
Teachers: 500 for Focus Group Discussions were randomly selected with a proportional representation of male and female (50:50)
Students: 300 Secondary - random sampling from Form 1 – Form 4 (50% male 50% female)
200 Primary – random sampling from Standard 4 – 7 (50% male 50% female)
Community: 25 Key Informant Interviews with stratified sampling of local administration and leaders (DEO, WEO, CDO, School Board members) and random sampling of 50 Community Members in Focus Group Discussions
4.3 BASELINE DESIGN
The study design applied a concurrent mixed model approach using data collection tools and methods to obtain both qualitative and quantitative data, which were independently analysed and then cross-validated. The qualitative approach was the primary source for addressing knowledge and attitudes towards ICT through, focus group discussions, particularly amongst children, the community and randomly selected teachers, key informant interviews and a desk review. The quantitative approach was applied through interviewer led questionnaires using purposive sampling of head teachers providing school context and teachers (where possible those who had ICT training and/or access to the internet) in both Primary and Secondary schools.

4.3.1 Data Collection process
14 Data Collectors were interviewed and 10 were contracted for a period of six weeks. All data collectors underwent 5 days training which included respondent selection, tools, conducting FGDs, research ethics, ODK, piloting and testing the tools and project planning and logistics. Study sites were grouped geographically for purposes of data collection. Data collectors (DC) were put into two groups (4 DC and 1 head data collector (HDC)). Group One was assigned to Kilimanjaro and Tanga Regions and Group Two assigned to Morogoro and Iringa Regions. Both groups collected data in Arusha Region. All DC’s were provided with identity cards and the HDC with relevant contacts in each region, a letter for the DEO. Data Collection took approximately 10 days in each region, which included 2 schools per day, community FGD, KII and travel.

4.3.2 Data Collection tools and transcription

Qualitative tools
i) Key Informant Interviews – enumerated one on one interviews with 25 government and other partners. Key informant Interviews were conducted by the Head Data Collector with a scribe, the tools were developed in English, translated and transcribed in Kiswahili.

ii) Focus Group Discussions – A total of 1250 were engaged in 125 Focus group discussions (300 Secondary and 200 Primary school students, 300 Secondary and 200 Primary school teachers and 50 community members), each group consisted of 10 respondents. Discussions sort to gather qualitative data from a random sample of teachers and students to better understand KAP attitudes towards ICT, FGD’s were conducted by two data collectors at each discussion, one guided the discussion and the other transcribed the data in Kiswahili.

iii) Desk research – was conducted using existing information on the demographic, educational and communication situations in Tanzania providing a background to the detailed data collected. Sources relied on include the ITU which publishes data comparing conditions of connectivity in a large number of UN member nations and documents from United Republic of Tanzania (URT) including MoEVT (Ministry of Education and Vocational Training), The World Bank and UNESCO.
Quantitative Tools, transcription and analysis

i) Detailed Surveys in schools - enumerated surveys with 50 Head teachers. These surveys sort to gather quantitative data on the demographics of the school. Data also included information on basic services and infrastructure, child / teacher ratios and performance.

ii) Teacher Surveys in schools – enumerated surveys with a total of 340 teachers 211 Secondary and 129 Primary school teachers. These surveys sort to gather quantitative data to provide a comprehensive picture of the demographic use of communications in schools and the community as well as providing an insight into teacher qualifications and current teaching methodologies and tools. Data also includes information on phone/smartphone/PC ownership, Internet usage, spend and challenges on access to telecommunication services.

4.3.3 Data Entry, quality control and analysis

Qualitative Data
All hand written qualitative data was transcribed in Kiswahili and reviewed by the Head Data collectors (HDC) for completeness. A coding template was developed and all FGD and KII were translated into English and transcribed onto separate word templates. The data was then analysed through triangulation and content analysis and aggregated by site, school type and beneficiary group.

Quantitative Data
All quantitative data was captured directly in a predesigned Open data Kit (ODK) using tablets. Data was uploaded onto the data base system once the data collector was able to reach Wi-Fi connectivity. To ensure high quality data was captured, checks were built into the ODK data capture interface and data cleaning was also applied. Quantitative data was analysed by indicator and desired disaggregation according to the expected outputs for the baseline.

Data from the desk review has been used to set the national context, where possible under each section. Quantitative data forms the basis for the majority of statistical analysis from the stratified sampling of teachers with a higher understanding and usage of the Internet than the perceived norm across the country. Qualitative provides the views of randomly sampled teachers, children and the community, whose attitudes and practices, better represent the general majority across the country.
5. BASELINE FINDINGS

This chapter presents the baseline findings from the study. A review of the national context is presented followed by a summary of findings and analysis of both qualitative and quantitative data from the study sites. This study focuses on five (5) out of the 25 regions, selected to provide a proportional representation of mainland Tanzania demographics for purposes of informing the iKnowledge project.

5.1 CONTEXT

5.1.1 NATIONAL

Population

At the time of the 2012 National Census, mainland Tanzania had a total population of 43,625,354 (51.8 Million World bank 2014) and is made up of 25 geographical and administrative regions where 70% (30,924,116) of the population lives in the rural areas. At the time of the 2012 National Census, there were 8,341,701 children enrolled in Primary schools and 3,699,137 in Secondary schools of which 76% and 70% respectively were in the rural areas.

Basic Services

32% of households in Tanzania access water through unprotected wells, rivers or springs, all of which are considered unsafe water sources. More reliable sources such as external piped and rainwater make up an additional 30%. 69% of households in Tanzania use uncovered pit latrines and 7% have absolutely no toilet facilities. 43% of households in mainland Tanzania do not have power (grid, gas, solar etc.) and use kerosene, candles, firewood or solar torches for means of household lighting. 20% of Primary schools and 63% of Secondary schools have electricity.

ICT Policies and Initiatives

The Government of Tanzania Policy and National Development plans focus on equity of access to resources across all areas of the formal education sector. In 2005 the MoEVT launched ICT integration for teachers education and TEHAMA launched ICT for secondary education in Tanzania. The Information and Communication Technology (ICT) Policy for Basic Education (2007) sets out guidelines for system wide ICT integration in basic education. “In general, very few schools have computers or Internet access, and most schools also lack electricity.” (MoEVT.)

4 http://data.worldbank.org/indicator/SE.PRM.ENRL.TC.ZS

5 The Information & Communication Technology (ICT) Policy for Basic Education (2007)
Computers and Broadband Internet
In 2012, only 6% of households in Tanzania owned a personal computer or laptop. Whilst this figure is rising, computer ownership is still extremely low resulting in the majority of users accessing the internet through cyber cafés. Broadband Internet availability in schools countrywide is very low.

Mobile and SMART phone
By 2012, 63% of households in Tanzania had access to a mobile phone, only a minority (less than 5%) had access to a SMART phone. According to the ITU, ‘Mobile broadband is growing fastest in developing countries, where growth rates over the last year are expected to be twice as high as in developed countries. This is driven by the availability and uptake of more affordable devices (smartphones) and types of plan on offer in the market.’ Whist still unaffordable to the majority, SMART phone usage is becoming more and more common in Tanzania particularly noticeable amongst teachers.

Teacher qualifications
The Education Sector Review (URT, 2011) reveal that there are challenges facing teacher education in Tanzania which include lack of adequate number of diploma teachers in science and mathematics in particular, poor pass rates in teacher education and lack of capacity in ICT training and supply of facilities. Findings from studies by the The MoEVT (2008) reveal the prevalence of ‘under-qualified teachers in the system.’ The Teacher Education (TE) response to the Primary Education Development Programme (PEDP 11) was to establish a number of changes to address the national increase in primary school enrolment and lack of teachers, one of which was to abolish teacher college fees so as to attract Form Four leavers to join teacher training courses and another to provide short courses to Form Six leavers with good pass to teach under license and to be trained by distance mode through the Open University of Tanzania (OUT).

Teacher/ Student ratios and Performance
According to The World Bank indicator of teacher / pupil ratio, in 2013 Tanzania had an average of 43:1 across both Primary and Secondary schools and Tanzania National Report 2011, a ratio of 1:40 per subject. Since 2004, there has been an increase in the number of Primary school children sitting for Primary School Leaving Examination (PSLE) with 50.6% passing in 2013 in the country. There has also been an increase in the number of Secondary Form 4 students sitting their final examinations but with this increase in attendance, there has been a decline in pass rate from 91%

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7 http://www.tzdpg.or.tz/fileadmin/documents/dpg_internal/dpg_working_groups_clusters/cluster_2/education/3-Core_Documents/2.02-Education_Sector/Teacher_Education_Development_and_Management_Strategy_2007-08_2010-11.pdf
8 Teacher Education (Preset and Inset) in Tanzania http://www.tenmet.org/Droop/Docs/QEC%202013/Chediel.pdf
in 2004 to 57.1% in 2013. This decline in performance is largely due to a rapid expansion of enrolment and lack of essential teaching and learning facilities to accommodate the expansion.

5.1.2 STUDY SITES

These quantitative findings from the study sites were captured from the detailed school surveys and stratified sampled teacher questionnaires.

<table>
<thead>
<tr>
<th>Region</th>
<th>Total Population</th>
<th>Rural #</th>
<th>Rural %</th>
<th>Urban#</th>
<th>Urban %</th>
<th># Primary School children (7-13 yrs)</th>
<th># Secondary School Children (14-17 yrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arusha</td>
<td>1,694,310</td>
<td>1,135,188</td>
<td>67%</td>
<td>559,122</td>
<td>33%</td>
<td>316,793</td>
<td>152,917</td>
</tr>
<tr>
<td>Kilimanjaro</td>
<td>1,640,087</td>
<td>1,242,712</td>
<td>75%</td>
<td>397,375</td>
<td>25%</td>
<td>307,070</td>
<td>157,115</td>
</tr>
<tr>
<td>Tanga</td>
<td>2,045,205</td>
<td>1,604,297</td>
<td>78%</td>
<td>440,908</td>
<td>22%</td>
<td>408,745</td>
<td>166,173</td>
</tr>
<tr>
<td>Morogoro</td>
<td>2,220,492</td>
<td>1,582,434</td>
<td>71%</td>
<td>638,058</td>
<td>29%</td>
<td>407,901</td>
<td>181,149</td>
</tr>
<tr>
<td>Iringa</td>
<td>941,238</td>
<td>684,058</td>
<td>72%</td>
<td>256,348</td>
<td>28%</td>
<td>185,893</td>
<td>84,936</td>
</tr>
</tbody>
</table>

Table 1. Regional Total Population Distribution Rural and Urban and Total school children

2014 Basic Demographic & Socio Economic Profile TZ Mainland

Basic Services

School water sources are predominantly from a piped outside source with 26% of sources considered to be unsafe. Selected school toilet facilities include 40% flush, 48% pit, 12% flush & pit. 99% are gender specific and 24% deemed to be in poor or very poor condition. One of the

criteria for selection of schools for the project was a good power supply thus 99% of all schools selected have power, which is not a true representation across schools countrywide. The majority of schools use grid electricity (86%) with an average number of power failure days per week Primary 1.3 and Secondary 1.6. Arusha and Morogoro had the highest days lost to power outage.

**Figure 1**

**All School Water Sources**

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>River</td>
<td>8%</td>
</tr>
<tr>
<td>borehole</td>
<td>3%</td>
</tr>
<tr>
<td>Well</td>
<td>18%</td>
</tr>
<tr>
<td>Spring</td>
<td>8%</td>
</tr>
<tr>
<td>Storage Tank</td>
<td>8%</td>
</tr>
<tr>
<td>Piped inside</td>
<td>26%</td>
</tr>
<tr>
<td>Piped outside</td>
<td>31%</td>
</tr>
</tbody>
</table>

**Figure 2**

**All School Electricity Sources**

<table>
<thead>
<tr>
<th>Source</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grid only</td>
<td>86%</td>
</tr>
<tr>
<td>Grid + solar</td>
<td>4%</td>
</tr>
<tr>
<td>Grid + solar only</td>
<td>8%</td>
</tr>
<tr>
<td>Generator</td>
<td>0%</td>
</tr>
<tr>
<td>Solar only</td>
<td>0%</td>
</tr>
<tr>
<td>No power</td>
<td>2%</td>
</tr>
</tbody>
</table>

**Figure 3**

**School Has Computers prior to project by Region**

<table>
<thead>
<tr>
<th>Region</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arusha</td>
<td>80%</td>
</tr>
<tr>
<td>Iringa</td>
<td>40%</td>
</tr>
<tr>
<td>Kilimanjaro</td>
<td>90%</td>
</tr>
<tr>
<td>Morogoro</td>
<td>70%</td>
</tr>
<tr>
<td>Tanga</td>
<td>70%</td>
</tr>
</tbody>
</table>

**ICT Availability, Access and Policies**

In selected schools teachers (FGDs) are aware that ICT policies exist but note that ICT is largely not considered an integral part of the curriculum but is restricted to a ‘few’ students who take part in ICT club (8/10 FGD respondents.)

**Computers**

43% (146/340) of teachers interviewed own a computer (40% (51/129) of Primary teachers and 45% (95/211) of Secondary). Generally it was felt that there is a severe lack of computers in all schools countrywide. High computer availability in selected schools was criteria for iKnowledge and 60% of study schools had computers prior to the project with an average of 13 per school. It must be noted that one area in Iringa had a disproportionately high number of computers per school.
Mobile and SMART phone

Only 1/340 teachers interviewed did not own a mobile phone. 75% of Primary school teachers and 62% of Secondary school teachers interviewed own a SMART phone.

Internet

There were no broadband school Internet services available in any of the selected schools (a prerequisite for school selection) but overall currently 102 (30%) of teachers surveyed (340) use the Internet on a school computer. Figure 6 shows the methods teachers use to access the Internet in schools, some connect through a telephone line (fixed) and others use more methods than one, hence why % exceeds 100.

Mobile phone reception is generally available with Iringa showing the poorest reception but it is reported to be good in most areas. Information on data mobile reception was not captured due to lack of understanding.
Teacher / Student Demographics and Performance

iKnowledge criteria included selecting schools with an existing ICT teacher. Teachers with ICT training were specifically selected to participate in the questionnaire survey and others were selected randomly. Thus the representation of teachers with ICT training is far higher than nationally. 71% of teachers interviewed were trained in ICT.

Gender representation and Education levels

Overall there was an even ratio of Male and Female teachers surveyed, split as Primary 71% female, 29% male and Secondary 63% male and 37% female. Figure 8 represents teacher qualifications and it is alarming to note that the majority (69%) of Primary school teachers have the minimal educational qualifications required to enter teacher training college (Secondary school Form 4 Pass).

Teacher Income

It is also interesting to note that Secondary school teachers with higher qualifications on average are earning a similar income to Primary School teachers, both of which are low salaries in the profession. Likewise the minimal increase in salary in relation to number of years in teaching with an average career ceiling at $347 per month is also indicative of the high attrition rate for teachers in Tanzania, which is estimated at 3 percent.\(^{10}\) (URT, 2006)

\(^{10}\) Teacher Education (Preset and Inset) in Tanzania http://www.tenmet.org/Droop/Docs/QEC%202013/Chediel.pdf
Table 2. Average Teacher income by school type and teaching years

<table>
<thead>
<tr>
<th>School Type</th>
<th>Average Teacher Monthly Income</th>
<th>US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>Tsh 639,834</td>
<td>292</td>
</tr>
<tr>
<td>Secondary</td>
<td>Tsh 607,648</td>
<td>278</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No Years</th>
<th>Average Teacher Monthly Income by Number of Years Teaching</th>
<th>US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0_to_5</td>
<td>522,797</td>
<td>239</td>
</tr>
<tr>
<td>6_to_10</td>
<td>646,299</td>
<td>296</td>
</tr>
<tr>
<td>11_to_15</td>
<td>739,827</td>
<td>339</td>
</tr>
<tr>
<td>more_than_15</td>
<td>757,285</td>
<td>347</td>
</tr>
</tbody>
</table>

*Note: There was some reluctance from teachers to provide details on their income which might have impacted data

Teacher/ Student ratios
iKnowledge school criteria included a low student/ teacher ratio. Findings from the study schools indicate that on average in Primary schools there are 28 teachers with 58 students per class and a student/ teacher ratio of 29:1. In Secondary schools there are an average of 47 teachers with 44 students per class with a teacher: student ratio of 15:1.

Student Performance
Findings here are in line with the National decline in pass rates from 91% in 2004 to 57.1% in 2013. This decline in performance is largely due to a rapid expansion of enrolment and lack of essential teaching and learning facilities to accommodate the expansion. See Figure 9 and 10 showing pass rates in Primary and grades at Form 4 in Secondary per region in 2014. The high levels of ‘fail’ across all regions, is alarming with very few students attaining distinction or merit.

Figure 9

![Primary Student Pass Rate - 2014](chart1)

Figure 10

![Secondary - Grades on Form 4 Final Exam - 2014](chart2)
5.2 TEACHERS KNOWLEDGE ATTITUDES AND PRACTICES (KAP) TOWARDS ICT

Qualitative findings in relation to Knowledge and Attitudes were captured from the Focus Group Discussions with randomly selected teachers. Quantitative findings in relation to Practices were captured from interviews with teachers.

5.2.1 Knowledge on ICT

### KEY QUALITATIVE FINDINGS – KNOWLEDGE

- 9/10 teachers had heard of the internet and know what it is used for
- Few (3/10) had ICT training
- Secondary school teachers are more likely to use SMART phones for downloading teaching material than Primary school teachers
- Very few (1/10) teachers use the internet for further learning

The vast majority of all teachers engaged in the Focus Group Discussions had heard of the internet (9/10) in all discussions. The majority had an understanding of what the internet could be used for citing e.g. educational material, global news and information, communication, job opportunities, further learning and social activities including social media e.g. Facebook and downloading movies and music.

The majority noted that the mobile phone networks provide the internet services and Vodacom and Tigo were mentioned the most in terms of effective service provision. Broadband services or types of services (4G, 3G etc.) were not cited but the majority were aware that internet services were sold in bundles and Megabytes.

Few teachers in the discussions had ICT training but the majority of those who used the Internet knew how to access and download teaching resources, these were largely amongst Secondary teachers many of whom used their SMART phones and or computers to download material. The majority used Wikipedia, search engines for this purpose but some noted that they lacked knowledge on how to navigate learning portals and identify sound information. This sometimes caused them to be overwhelmed with the choice available on the Internet and unsure if the information they had downloaded was reliable.

Some teachers were aware of the potential for further learning e.g. Diploma, Degree courses available on line but none had accessed them.
5.2.2 Attitudes towards ICT

### KEY QUALITATIVE FINDINGS - ATTITUDES

- 100% of teachers felt that ICT skills development should be an integral part of education
- The majority (8/10) felt that ICT would enhance their teaching capacity
- The majority (8/10) said integrating ICT would improve academic potential of students
- The vast majority (9/10) stated schools were ill equipped with ICT resources
- The vast majority of Primary teachers (9/10) felt unconfident to use the computer as a teaching resource
- Key issues around fear include; lack of skills, cultural and language barriers and difficulty in navigating the internet
- 100% of teachers who use the internet are willing to pay

All teachers engaged in the discussions thought that ICT skills development should be an integral part of education. Many felt that access to ICT was a human right in terms of accessing quality education and exposure to global information and networks. The majority of teachers felt that training and skills development in ICT would enhance their teaching capacity and ultimately improve their own learning as well as the academic potential of children.

*Figure 11 Word Cloud: Capturing teacher’s perceptions on the potential of ICT (according to frequency)*

The vast majority (9/10) of teachers in the discussions felt that schools were not sufficiently equipped with computers or Internet services (‘the majority of schools in this area do not have computers’) and that most children (both Primary and Secondary) were not competent in basic
computer skills. All teachers felt that if they were given the necessary skills they would be prepared and willing to train others.

Confidence and fears
The majority (9/10) of secondary school teachers engaged in the discussions felt confident to use ICT for themselves to download teaching resources and then print out for use but many noted that they were not confident to use their skills when in class. They felt that there was a lot of potential information that they were not able to access due to lack of skills. They had more confidence in relation to personal use, which included using SMART phones to download teaching resources and then use in class, music and movies and access Facebook and other social media portals. All those that use the Internet felt that if it were not available, it would negatively affect their lives.

Many teachers do not feel confident to use computers and Internet as a resource when teaching a class. The majority of Primary school teachers felt overwhelmed, unconfident and fearful of using the computer and internet due to lack of ICT skills, language barriers and cultural taboos. Very few teachers felt they were sufficiently trained (the majority of those who did feel confident to teach children with computers were trained ICT teachers.) The main issues around teachers’ fear were – lack of skills, difficulty in navigating for information, language barriers, exposure to unsuitable or explicit material and cost. Cultural barriers, individual and societal change, are some of the core issues that contribute to the fear associated with ICT.

Figure 12 Word Cloud: Capturing teacher’s perceptions on the negative impact of & barriers to ICT
Accessibility and Affordability
The main issues affecting accessibility relate to poor network, lack of effective and reliable service providers and infrastructure and high cost. Of those teachers that use the Internet, the majority said they were willing to pay to use and on average this amounted to an individual spend of up to Tsh 5,000 ($2) per week. However many said that it was unaffordable.

Responsibility
The majority said that it was the responsibility of government and schools (Ministry of Education, head teachers, Board of Governors) to improve ICT equipment and connectivity in schools. Some cited that the Non Profit sector should be responsible for providing computers and equipment, others that it was the responsibility of parents to pay an additional amount to the school to contribute to the purchase of equipment and to sustain the connectivity charges. Many said that it was the responsibility of service providers to establish more towers in the community and ensure that they are maintained properly.

Figure 13 Word Cloud: Capturing teacher’s perceptions on who is responsible for ICT provision in schools

Recommendations
The majority of teachers said that there was a lack of awareness on ICT in schools and the community. There was a distinct variance in perceptions of community use and knowledge in different regions with very few people apparently using the Internet in the rural areas of Mufindi and Korogwe compared to the communities in Morogoro and Arusha, many stated that there needs to be community awareness education on the use and benefits of ICT. Establishing more Internet sites in the community and training centres for teachers as well as community members to reduce the high levels of misconception and fear around the Internet.
5.2.3 ICT Practices

**Teachers’ computer and Internet use (Teacher Questionnaires)**

The National ICT Policy of 2003 recognizes the role ICT can play to ‘enhance education, including improving teaching methodologies... and for teaching of not only ICT, but of all subjects and specializations.’ The reality in Tanzania is that the majority of Secondary and in particular Primary school teachers do not have the skills to effectively use ICT in their teaching and / or have adequate access to computers or Internet facilities.

Quantitative findings in relation to Practices were captured from interviews with strategically selected teachers and qualitative findings from Focus Group Discussions with randomly selected teachers.

<table>
<thead>
<tr>
<th>KEY QUANTITATIVE FINDINGS – PRACTICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 95% Secondary and 82% of Primary teachers use the internet</td>
</tr>
<tr>
<td>• 35% Primary and 15% Secondary have never used the computer/ internet in class as a teaching resource</td>
</tr>
<tr>
<td>• 85% of all teachers have used the internet for downloading teaching resources at some point</td>
</tr>
<tr>
<td>• 78% of teachers use the internet for social media, mainly Facebook</td>
</tr>
<tr>
<td>• 13% of teachers regularly use the computer for planning and administration</td>
</tr>
<tr>
<td>• Most frequently mentioned challenges to using the internet include; poor connectivity, high cost, lack of computers and ICT skills and cultural barriers</td>
</tr>
</tbody>
</table>

Findings from the selected schools show that despite the challenges, (lack of resources, connectivity and funds) teachers are both willing and in many instances able to access the Internet. In particular teachers predominantly use the Internet to access resources online to download and print to support their teaching. It must be noted that a criteria for selection for iKnowledge was a high frequency of teachers owning SMART phones and the availability of computers in schools. However, all schools surveyed had no broadband Internet facilities. The figures below provide an insight into frequency, use and mode of access to the Internet as well as the most commonly accessed online resources for teaching and popular social media portals.
There was little variation on teacher Internet usage by region with the lowest usage in Iringa (84%) and highest in Arusha (95%).

Figures 15 and 16 Frequency of Downloading Teaching Resources by teacher type

Primary Teachers

- Every Time: 5%
- Most Times: 16%
- Some Times: 47%
- Never: 30%
- Don't Know: 2%

Secondary Teachers

- Every Time: 0%
- Most Times: 15%
- Some Times: 29%
- Never: 51%
- Don't Know: 5%
290 /340 teachers surveyed (85%) use Internet for learning, teaching and educational purposes.

266 out of 340 teachers surveyed (78%) utilize social media sites on the Internet. Of those using Internet for such purposes, the breakdown of sites used is shown in Figure 20.
Of the 259 teachers (76%) that use computers, the chart below shows the frequency that such teachers use computers for lesson planning and administrative purposes.

Most common forms of current teaching practices and aids (other than downloaded materials) include using textbooks, diagrams and illustrations, songs and drama, question and answer games, quizzes and discussions.
In order to improve and increase ICT in schools, the vast majority of teachers said that the following needs to be done i) government to provide clearer policies on ICT ii) increase number of trained ICT teachers iii) provision of more computers and stable Internet connection iv) integrate ICT as part of the school curriculum.

The most common notions around how to sustain Internet connectivity in schools included i) establishing a school Internet café for students and the community ii) establishing short, fee paying ICT courses for the community and iii) downloading teaching resources and selling them.

*Figure 22 Word Cloud: Teachers’ perceived challenges affecting uptake and effective use of ICT in schools*
5.3 STUDENTS KNOWLEDGE ATTITUDES AND PRACTICES (KAP) TOWARDS ICT

Qualitative findings in relation to Knowledge and Attitudes were captured from the Focus Group Discussions with randomly selected students in Secondary (Form 1-4) and Primary schools (Standard 5-7) across the study sites.

**KEY QUALITATIVE FINDINGS – Secondary Students KAP**
- Majority of Secondary school students (8/10) have heard of internet
- Few (4/10) use the internet or computer
- In rural areas, many (6/10) had never seen a computer
- Main use of computer or internet is for playing games and social networking
- Parental disapproval is a serious barrier to using internet
- The majority (3/4) felt ‘unconfident’, ‘overwhelmed’ or ‘fearful’ of using the internet
- Most (8/10) stated teachers did not use the computer or internet in their teaching
- The majority said Internet and computer use was available to only a few in clubs

**Secondary School Students**
The majority of Secondary School students have heard of the Internet but noticeably many of those in more remote areas had not heard of it (8/10.)

On average 4/10 Secondary students engaged in discussions use a computer or the Internet. In many areas, particularly in rural schools the majority of students had never used or even ‘seen’ a computer.

Of those students who have used the Internet, the majority used it for playing games, social networks and a few for accessing learning materials and national examination results. The majority of students noted that they did not know how to access learning materials or on line resources.

Challenges to using the Internet mentioned most frequently were i) cost ii) lack of computers and cyber cafes iii) lack of skills iv) poor internet and v) parental disapproval.

Parental disapproval and culture were mentioned frequently as a barrier to accessing the Internet with fears around ‘inappropriate language’, ‘exposure to adult stuff’, ‘moral decay’ and ‘sexually explicit information’ mentioned frequently.

On average, 1/4 felt confident to use the computer and Internet but the majority felt ‘overwhelmed’, ‘unsure’ and ‘fearful’ due to a lack of skills and the language barrier.
The overwhelming feeling was that there was very little opportunity for the majority of students to access computers or the Internet at school. Where there are computers at school, teachers predominantly use them and students are not given access to them or provided with training on how to use them. The vast majority stated that the only students who had access to ICT were members of the ICT club and there was an overwhelming demand for ICT to be available to all students in schools. Very few students stated that they had computer lessons in school. It was generally felt that teachers were not sufficiently trained to teach them ICT but ICT teachers were qualified and willing to support only those in the club.

Few noted that teachers use online resources in their teaching, the main process involved downloading from the Internet and using printed copies as a teaching resource. The majority said they did not know if teachers used online resources to support their teaching.

Most students said it was the responsibility of the government and teachers to provide ICT in schools.

*Figure 23 Word cloud: Perceptions of Secondary and Primary students on potential of the Internet*
Primary School Students

KEY QUALITATIVE FINDINGS – Primary Students KAP (Arusha, Iringa and Tanga)
- Few (3/10) children felt that they knew how to use a computer
- The majority of children (9/10) felt ‘scared’ and ‘overwhelmed’ of using the internet
- The vast majority (9/10) said that they had never seen a teacher use a computer
  - All children want ICT in schools as part of the curriculum
- Main barriers to ICT include; lack of computers, lack of skills, parental attitude, cultural barriers

It was interesting to note that Primary schools selected in Kilimanjaro and Morogoro all had a high number of computers (15 – 30 per school), ICT teachers and computer lessons for the majority of children. Children used computers mainly to ‘play’ and to ‘learn.’ In these schools the majority of children said that they had heard of the Internet and many said they felt confident to use a computer (6/10.) Children noted that teachers were trained and willing to let them use computers, encourage and help them. They were however not familiar with the Internet and the majority had not used it.

Findings from the two other study sites Iringa and Tanga showed that the majority of children had heard of the Internet but few felt they knew how to use a computer (av. 3/10). Overall computers were largely unavailable in these schools and if there was a computer it was used for administrative purposes by the teachers. In one school computers were available, there was an ICT teacher but no classes. In Arusha two schools had no computers and where the schools had computers the children reported that they were allowed to use the computers but there were no lessons.

Despite there being a huge variance in the availability of computers across all primary schools, there were little differences in the perceptions of the Internet. Most felt very unsure about using the Internet with the majority stating that they were scared of using it (av. 9/10) largely due to i) lack of skills ii) difficult language and language barriers iii) lack of skills iv) adult pictures and information and v) parental disapproval.

Children generally feel that they do not have skills to use the computer or knowledge on how to use the Internet. The vast majority did not know if teachers used the Internet for teaching purposes, as they had never seen them use computers. Some inferred that ‘they have a computer so they probably do.’
Of Secondary and Primary students, most said it was the responsibility of the government and teachers to provide ICT in schools.

*Figure 24 Word cloud: Perceptions of Secondary and Primary students on what needs to be done*
5.4 COMMUNITY KNOWLEDGE ATTITUDES AND PRACTICES (KAP) TOWARDS ICT

Qualitative findings in relation to Knowledge and Attitudes were captured from the Focus Group Discussions with randomly selected community members including youth, business and leaders.

<table>
<thead>
<tr>
<th>KEY QUALITATIVE FINDINGS – Community KAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 100% respondents had heard of internet but it was more widely used in urban / peri-urban areas rather than rural</td>
</tr>
<tr>
<td>• Internet most frequently used by the youth, business people mainly for social media</td>
</tr>
<tr>
<td>• 100% stated that there was a need to improve access to ICT in schools and the community</td>
</tr>
<tr>
<td>• There is a lack of understanding and awareness in the community of the potential of internet</td>
</tr>
<tr>
<td>• Cultural taboos and fear are a key barrier to internet usage in schools and the community</td>
</tr>
</tbody>
</table>

Focus Group discussions held with community members made up of leaders, local business people and youth revealed that all respondents had heard of the Internet and said that on the whole it was widely used in the communities, however there was a discrepancy between urban and very rural areas, the latter with far fewer knowing about or accessing the Internet.

The majority stated that it was business people, youth and students who used the Internet predominantly for social networking e.g. Facebook, WhatsApp and YouTube. Respondents said that there was lack of knowledge about uses of the Internet and its potential. Business people said that they sometimes used it to identify market prices, etc. but generally they lacked the skills to know how to use eCommerce effectively.

Community perceptions on the issues affecting ICT in schools included ‘too many students per class’, ‘teachers do not let students use computers, ‘not enough computers’, ‘lack of funds to pay for regular Internet usage’ and ‘lack of commitment from school and government to include ICT in curriculum.’ All respondents felt that there was a need to improve ICT in business, schools and the community.

The large majority felt that it was the responsibility of government to ensure the ICT is an integral part of education at Primary and Secondary level, particularly in improving teaching of Science and Technology. Many felt that the government should bare the cost and some felt that parents should pay extra for children to access ICT in schools. Many felt that there were not enough
access points and / or education in the community and thought that schools should provide ICT classes for the community.

Cultural taboos and fear of the Internet are deeply entrenched in most communities with issues around ‘inappropriate behaviour’, ‘explicit information and pictures’, ‘lack of privacy’ and ‘moral decay’ being the most frequent perceptions of the negative potential of the Internet.

### 5.5 KEY INFORMANT KNOWLEDGE ATTITUDES AND PRACTICES (KAP) TOWARDS ICT

Qualitative findings in relation to Knowledge and Attitudes were captured from the Key Informants including School Board members, District and Ward Education officers, Doctors, Nurses, Community Development and Environmental officers.

<table>
<thead>
<tr>
<th>KEY QUALITATIVE FINDINGS – Key Informant Interviews KAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 8% of respondents do not use the internet</td>
</tr>
<tr>
<td>• Only 1 respondent uses internet regularly for email</td>
</tr>
<tr>
<td>• 56% use it regularly mainly for social media</td>
</tr>
<tr>
<td>• 36% use internet regularly at work</td>
</tr>
<tr>
<td>• The majority access internet through a SMART phone</td>
</tr>
<tr>
<td>• Main barriers to ICT usage in the community, schools and at work include; cost, lack of skills and resources</td>
</tr>
<tr>
<td>• All respondents stated there was a need to address community awareness, infrastructure and cost effectiveness of internet connectivity.</td>
</tr>
</tbody>
</table>

The majority of respondents had been educated up to Higher Degree level.

All respondents had heard of the Internet, 68% owned a computer and 88% used one. 84% owned a SMART phone.

8% do not use the Internet and only 56% used it on a daily basis and this was largely for social use, the most frequently mentioned being Facebook, What’s App, YouTube and Twitter. Other reasons for accessing the Internet included ‘information sourcing’ predominantly through Wikipedia and Google. 1 respondent used the Internet for email purposes.

Of those that use the Internet, the main method of connection was through the SMART phone hotspot and modem. The majority used the Internet at home or at the cyber café, only 36% used it regularly at work.
The time travelled to access Internet café ranged between 10 – 20 minutes (with the longest time taking 40 minutes.) The average spend on data was Tsh 5,000 ($2) per week and average spend on mobile phone (voice) Tsh 10,000 ($5) per week.

66% of respondents had received basic training in ICT, all of which said it was either ‘good’ or ‘helpful.’ The majority stated that there is a lack of opportunity to train in ICT both at work and in the community. The overall perception was that the most common groups of people to use the Internet in the community were business people, youth and teachers. There is lack of education and information about the Internet in the community and its potential positive use. Cultural barriers and negative connotations prevail, particularly amongst the elderly. In particular people fear the Internet due to its impact on ‘moral decay’, ‘cultural destruction’, ‘inappropriate material’ and ‘sexual content.’

All respondents said that there was a need to increase and improve infrastructure at the work place, in schools and in the community. Main barriers to usage include ‘poor network’, ‘high cost’ ‘lack of skills and knowledge’ and ‘poor maintenance of infrastructure.’

All respondents said that there was a huge demand for more training, equipment and improved cost and efficiency of connection.
6. CONCLUSION

This baseline study highlights some of the key issues affecting accessibility and the integration of ICT in Primary and Secondary schools in Tanzania. Whilst the iKnowledge project identifies schools and teachers with a higher percentage of ICT access and usage than the majority across the country, it is apparent that even amongst these select schools, ICT infrastructure and teacher skills and capacity are lacking.

Relative to the overall computer/internet accessibility in Tanzanian schools, findings from the study schools highlight that computers are not generally used as a teaching resource in classrooms and the majority of Primary and Secondary schools do not have adequate computer facilities to integrate ICT as part of the school curriculum. Likewise internet access is sporadic, unreliable and costly. Access is largely dependent on individual teacher motivation to resort to their own methods of connection. Whilst teachers use the internet predominantly for personal use, there is a willingness to attempt to access teaching resources online but an overwhelming lack of knowledge on how to navigate or identify relevant information. This process of downloading information, printing and using it to support their teaching in class is also laborious and costly. There is a lack of subject specific, educational content readily available for teachers to use as a teaching resource and little or no ICT training opportunities.

In addition to the lack of resources and capacity, there is a distinct lack of confidence amongst teachers to use computers and the internet in their teaching, this is mirrored amongst students. Despite this, 100% of all respondents stated that they would like to utilize ICT in their teaching and learning. Cultural taboos and fear around perceptions of the internet must be recognized as a significant barrier to ICT integration in schools and the community.

In line with and supporting the many Government policies and initiatives, the iKnowledge project will bring ICT and satellite Internet access to 250 schools across 25 regions in Tanzania, equipping them not only with the necessary infrastructure and computer equipment but also addressing the lack of teacher ICT skills by advancing their digital literacy and understanding through a sustainable training model of 'Train the Trainers'. The project will allow teachers to use updated online teaching aids and specific portals with educational content to apply straight into their classrooms, greatly improving their teaching methodologies and the academic potential of students.