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Factors affecting ICT implementation in selected secondary schools in Chipata district

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Abstract
The purpose of study is to investigate and establish the challenges in implementation of ICT in selected Secondary Schools in eastern province of Zambia, Chipata. The studies done in other countries have shown that this ICT is very good as it lays a good foundation for the development of the nation. This could have been due to a gap between the rich and the poor people that existed when time came to take their learners to school. The gap theory used in the study suggested that the rural schools would fail to implement ICT to children but the urban schools would do that without any problem. This could lead to underdevelopment and dependence syndrome in the country by the rural schools.
ICT comes as a solution to all these problems and helps bring equality in development and education in the nation. Poverty and diseases, crime and early marriages are also prevented as children will be busy with computers and other gadgets used in schools and use their basic knowledge to do a lot of developmental activities like entrepreneurship that has been introduced and also just becoming responsible children who are well informed about their rights not to involve themselves in early marriages and crime. The children learn a lot at primary level to make them self-dependent when they grow up and help develop the nation. When introduced to ICT at this level learner get more exposed to the world they live in and thus be very important tools of development in the areas where they live.
ICT has a lot of advantages to learners and the society at large but its implementation needs much preparation. The preparation need to be done by the government in the area of training materials(books and ICT devices), school laboratories, ICT teachers and psychologically convince the learners the benefits of the new subject ICT. If these are not looked into Implementation will always fail even if they would debate about it or call people from other countries to help them it will still fail.
Finally, implantation of ICT needs a good strategy by the government for example piloting it in a village set up and see the results then start implementing step by step to the whole nation until it is nationally implemented.

Keywords: ICT implementation, factors affecting ICT, Challenges

1. Introduction
This paper will endeavour to discuss the Factors affecting ICT implementation in selected secondary schools in Chipata district. ICT (information and communications technology - or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries. The term is somewhat more common outside of the United States.
ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony.
In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. But ICTs are more than just these technologies; older technologies such as the telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools. For instance, radio and television have for over forty years been used for open and distance learning, although print remains the cheapest, most accessible and therefore most dominant delivery mechanism in both developed and developing countries. The use of computers and the Internet is still in its infancy in developing countries, if these are used at all, due to limited infrastructure and the attendant high costs of access.
Moreover, different technologies are typically used in combination rather than as the sole delivery mechanism. For instance, the Kothmale Community Radio Internet uses both radio broadcasts and computer and Internet technologies to facilitate the sharing of information and provide educational opportunities in a rural community in Sri Lanka. Similarly, the Indira Gandhi National Open University in India combines the use of print, recorded audio and video, broadcast radio and television, and audio conferencing technologies.
In modern society ICT is ever-present, with over three billion people having access to the Internet. With approximately 8 out of 10 Internet users owning a Smartphone, information and data are increasing by leaps and bounds. This rapid growth, especially in developing countries, has led ICT to become a keystone of everyday life, in which life without some facet of technology renders most of clerical, work and routine tasks dysfunctional. The most recent authoritative data, released in 2014, shows "that Internet use continues to grow steadily, at 6.6% globally in 2014 (3.3% in developed countries, 8.7% in

the developing world); the number of Internet users in developing countries has doubled in five years (2009-2014), with two thirds of all people online now living in the developing world.

However, hurdles are still at large. "Of the 4.3 billion people not yet using the Internet, 90% live in developing countries. In the world's 42 Least Connected Countries (LCCs), which are home to 2.5 billion people, access to ICTs remains largely out of reach, particularly for these countries' large rural populations." ICT has yet to penetrate the remote areas of some countries, with many developing countries dearth of any type of Internet. This also includes the availability of telephone lines, particularly the availability of cellular coverage, and other forms of electronic transmission of data. The latest "Measuring the Information Society Report" cautiously stated that the increase in the aforementioned cellular data coverage is ostensible, as "many users have multiple subscriptions, with global growth figures sometimes translating into little real improvement in the level of connectivity of those at the very bottom of the pyramid; an estimated 450 million people worldwide live in places which are still out of reach of mobile cellular service."

Favorably, the gap between the access to the Internet and mobile coverage has decreased substantially in the last fifteen years, in which "2015 is the deadline for achievements of the UN Millennium Development Goals (MDGs), which global leaders agreed upon in the year 2000, and the new data show ICT progress and highlight remaining gaps deadline for achievements of the UN Millennium Development Goals (MDGs), which global leaders agreed upon in the year 2000, and the new data show ICT progress and highlight remaining gaps." ICT continues to take on new form, with nanotechnology set to usher in a new wave of ICT electronics and gadgets. ICT newest editions into the modern electronic world include smart watches, such as the Apple Watch, smart wristbands such as the Nike+ Fuel Band, and smart TVs such as Google TV. With desktops soon becoming part of a bygone era, and laptops becoming the preferred method of computing, ICT continues to insinuate and alter itself in the ever-changing globe.

Today's society shows the ever-growing computer-centric lifestyle, which includes the rapid influx of computers in the modern classroom.

Information and Communication Technology can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development and more efficient education management, governance and administration. UNESCO takes a holistic and comprehensive approach to promoting ICT in education. Access, inclusion and quality are among the main challenges they can address. The Organization's Intersectral Platform for ICT in education focuses on these issues through the joint work of three of its sectors: Communication & Information, Education and Science.

At independence, Zambia inherited an education system that was characterized by racial segregation and different types of curricula for the various races namely Europeans, Asians, Arabs and Africans, UNESCO, (2005) [45]. The colonial schools had a different curriculum from that of the African independent and the 65 missionary schools. According to Otach, (2008) [32] "before 1960, free and universal primary education had not been extended to African children in any of the East African British colonies, racial discrimination in primary education was still intact" The expansion of primary education remained a crucial problem in the colonial era. The situation did not radically change with the achievement of independence in 1964. ACTIONAID-Kenya (2004) reports that, the achievement of independence heightened pressure to increase the school population and a rapid more towards universal primary education. The purpose of education was political, social, cultural, humanistic and economic, (UNICEF & World Bank, 2009) [47]. It was expected that the education would mould a whole individual who will contribute profitably to society.

In January 2014 the PF (Patriotic Front) government implemented the ICT policy in primary and secondary education programme with the aim of providing more opportunities to the disadvantaged school age children. The programme created a positive outcome because it resulted in significant increase in enrolment in a majority of the schools.

However, serious challenges have bedeviled the implementation of the ICT policy, UNICEF & World Bank, (2009) [47]. They include congested classrooms, limited physical facilities and shortage of qualified teachers, lack of computers, lack of power which negatively impacted on the quality of teaching and learning on one hand and contributed to failure rate in ICT in schools on the other Okwach & George, (1997) [31]. This paper therefore reviews the ICT policy highlighting its achievements and challenges. The paper also assesses the progress and establishes the Factors affecting ICT implementation in selected secondary schools in Chipata district in eastern province of Zambia.

1.1 Statement of the problem

It is sad to note that despite the government's commitment to eradicate ICT illiteracy through introduction of ICT to secondary schools the education levels have continued decreasing. This has been attributed to poor pupil teacher ratio in the nation and lack of training materials and qualified personnel. This research is designed to find out the extent to which ICT have imparked on the social welfare of the nation and investigate and establish the Factors affecting ICT implementation in selected secondary schools in Eastern Province, Chipata.

1.2 The purpose of study

The purpose of study is to investigate and establish the Factors affecting ICT implementation in selected secondary schools in Chipata district in eastern province of Zambia.

1.3 Objectives of the study

The objectives of this study are:

Aim

To establish the challenges that affects the implementation of ICT in primary and secondary schools.

Specific objectives

1. To assess the impact of ICT education implementation on pupils performance.
2. To establish factors that would lead to successful implementation of ICT policy in Zambia.
3. To identify challenges of ICT education implementation policy in Zambia.

4. To assess the impact of infrastructure and computer resources on implementation of ICT in primary and secondary schools ICT in Chipata District.

1.4 Research questions

1. What is the impact ICT education implementation on the pupil's performance in Chipata district?
2. What are the factors that would lead to successful implementation of ICT in Zambia?
3. Identify challenges of ICT education implementation policy in Zambia.
4. What is the impact of infrastructure and computer resources on implementation of ICT in primary and secondary schools in Chipata District?

1.5 Significance of study

The study was important because it would assist the government to assess the challenges in implementation of ICT in Secondary Schools in Zambia so that the decision to continue or stop it can be made. In addition the study will provide valuable information to government and other interested parties like the NGOs; Civic organizations who would like to come on board to help poor children get their ICT education. In addition, the study was important because the findings would provide information that would be essential to a number of stakeholders such as the school administrators, teachers, the Social Sciences Teachers Association of Zambia, pupils, the Examination Council of Zambia, the Ministry of education and the government at large to initiate measures that will help implement ICT in future and come up with strategies to help educators improve the academic performance of pupils in ICT. Furthermore, the study would offer some insights to other researchers wishing to engage in further studies and contribute to the improvement of the quality of ICT education in Zambia.

1.6 Limitation of the study

In this study, the researcher limited his study to Chipata urban area in the township of Munga, Magazine, Magwero, Gonda, Chizongwe and Kalongwezi townships were chosen due to limited time and financial resources in which to carry out the research. The population of study is made up of teachers, members of the community, provincial education officer, district board secretary, pupils, and head teachers.

The choice of Chipata district did not however make other district less important, but it was just appropriate because of the following factors: Easy transport, availability of communication network facilities, lack of enough funds to go to other towns and accommodation.

1.7 Scope of Study

This research paper assessed the challenges in implementation of ICT in selected Secondary Schools in eastern province of Zambia, Chipata and give conclusion and recommendations.

2. Literature review

This section summarizes the literature that is already in existence regarding factors

Influencing ICT projects in secondary schools and their relationship. It presents an overview of previous work on related topics that provide the necessary background for the purpose of this research.

2.1 Global perspective

ICT is a generic term referring to technologies which are being used for collecting, storing, editing and passing on information in various forms SER, (1997) [39]. A personal computer is the best known example of the use of ICT in education, but the term multimedia is also frequently used. Multimedia can be interpreted as a combination of data carriers, for example video, CD-ROM, floppy disc and Internet and software in which the possibility for an interactive approach is offered Smeets (1996) [23].

Generally, the following functions of the use of ICT in education are described in literature (SER, 1998, Moonen and Kommers, 1995, Pilot, 1998) [22, 15, 17].

1. ICT as object. It refers to learning about ICT. Mostly organised in a specific course. What is being learned depends on the type of education and the level of the students. Education prepares students for the use of ICT in education, future occupation and social life.
2. ICT as an 'assisting tool'. ICT is used as a tool, for example while making assignments, collecting data and documentation, communicating and conducting research. Typically, ICT is used independently from the subject matter.
3. ICT as a medium for teaching and learning. This refers to ICT as a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn. It appears in many different forms, such as drill and practice exercises, in simulations and educational networks.
4. ICT as a tool for organisation and management in schools.

In 1998, OCTO (a Dutch educational research institute) studied the extent in which ICT is actually being used for realizing the above-mentioned functions. The research was carried out on all educational levels in The Netherlands. The present work concentrates on vocational education. However, given the lack of a sufficient response, a reliable image for the entire sector cannot be given, but an impression of the status quo of the use of ICT in vocational education is possible. Janssen Reinen, (1999) [11]. "ICT is never being used as a (learning) objective by 33 of 55 teachers; 27 teachers do not use ICT as teaching material and 21 teachers do not use ICT as an aid". If the computer is being used, then this is mainly for the purpose of word processing and exercising the lessons. Thus, it seems that the computer is being used especially for supporting more traditional educational settings Janssen Reinen, (1999) [11].

We can conclude (present work and uncited literature) that ICT has many technical possibilities, but that the real innovative use of ICT is not broadly adopted in Dutch vocational education.

For most European countries, the use of ICT in education and training has become a priority during the last decade. However, very few have achieved progress. Indeed, a small percentage of schools in some countries achieved high levels of effective use of ICT to support and change the teaching and learning process in many subject areas. Others are still in the early phase of Information and Communication Technologies adoption.

According to Bingimlas, K. (2009) [10], Technology Integration Initiative was designed in Ireland to support schools in developing their ICT infrastructure. Schools received grants for the purchase of computer hardware, and those schools that did not already have an internet connection

were assisted in getting on line. The aim of the Technology Integration Initiative was to have at least 60,000 computers in schools by the end of 2001. In the following year the NCTE census reported that there were some 84,000 computers in Irish schools. The Teaching Skills Initiative recognized that there was little point in putting computers in schools unless teachers were trained in their use. This initiative provided for teacher training in three distinct areas, namely ICT skills and awareness, professional skills development in ICT, and pedagogical skills development. The Schools Integration Project dealt with whole-school development and investigated a range of teaching and learning topics with regard to ICT integration. Approximately ninety pilot projects were established in a number of "lead" schools, which worked in partnership with education centers, businesses, industry, third-level institutions, and the community. Most of the individual projects implemented as part of the SIP concluded in 2001 and 2002, and the remainder were completed in 2004 (Broadley, T., 2012) [12].

Schools IT 2000 envisaged that ICT advisors would be appointed in education centres to support the work of the NCTE by providing leadership, training and support, including on-line support, at the regional level and by providing regular feedback on progress and issues arising. Ultimately some twenty ICT advisors (later increased to twenty-one)—one in each of 16 the full-time education centres-were appointed. The main role of these advisors may be summarised as follows: to advise and support teachers in their region in integrating ICT in their teaching and in their students' learning, to build a knowledge base on all matters relating to the use of ICT in their local schools. A report on the implementation of Schools IT 2000 published in 2001 revealed a high level of satisfaction with the initiatives implemented under IT 2000 -National Policy Advisory and Development Committee (Tubaishat, A. and Lansari, A. 2011) [42].

According to Tubaishat, A. and Lansari, A. (2011) [42], the report, however, identified three issues of concern as follows: the need for more training for teachers, the need for more funding (equipment and computers, maintenance, support), the need for more support (technical support, encouragement to use ICT). Based on its findings, the committee made recommendations covering a range of areas, including policy, funding, and the professional development of teachers, pre-service teacher education, infrastructure, and technical support.

In 2001 the Government launched its second policy document on ICT in education, (A Blueprint for the Future of ICT in Irish Education). This was a three-year strategic plan designed to support the continuation of the main initiatives begun under IT 2000 and to build on the progress achieved under that plan. The main objectives of the Blueprint policy were to: to expand ICT capital provision to schools, increase access to, and the use of, internet technologies, further integrate ICT in teaching and learning, enhance professional development opportunities for teachers (BECTA, 2009) [8].

Schools in the LDCs especially in Africa and those in their development phase have not been left behind as far as ICT in education is concerned. Bordbar, F. (2010; 2011) [11] points out that many developed countries have implemented ICT successfully into schools for teaching and learning, and argue that, owing to the cost of implementing ICT into education, many LDCs have fallen behind with the implementation process. According to Broadley, T. (2012) [12], most governments around the world see the development of ICT policies as indispensable to the successful integration of ICT in education. According to Kozma and Anderson (2010) [22], 17 countries from Chile to Finland and from Singapore to the United States have all set national goals and policies that identify a significant role for information and communication technologies (ICT) in improving their education systems and reforming their curricula. Major investments have been made to increase the numbers of computers in schools and the networking of classrooms (2002:387). While governments do all they can to initiate computer implementation in schools, it is the poorer countries who have lagged behind in the computer implementation process. A report published by UNESCO (2010) [46] on the state of ICT projects in education in Africa states that, although ICT in education is seen as significant in many aspects in a computer-rich world, there is still a huge gap regarding implementation of computers in schools between rich and poorer countries. This is what is known as the 'digital divide (Williams, 2011) [49]. World Bank (2010) [50] describe the 'digital divide' as a growing disparity between those individuals and communities that have and those that do not have easy access to new information technologies, (2001: 261).

The digital divide is more evident in the implementation rate of computers in schools. According to Castro Sánchez, J. J. and Alemán, E. C., 2011.) [3], while many developed countries have had a 90 – 100% computer implementation success rate; developing countries have had less success with the implementation of computers in their schools. For example in United Kingdom, the government spending on educational ICT in 2008–09 in the UK was £2.5bn, in United States, the expenditure on K-12 schools and higher education institutions was $6 billion and $4.7 billion respectively in 2009 and in New Zealand, the government spends over $ 410 million every year on schools ICT infrastructure (Ajayi, L., 2009) [2].

Despite all these investments on ICT infrastructure, equipments and professional development to improve education in many countries, (Barolli, E., 2012) [6] claimed that huge educational investment have produced little evidence of ICT adoption and use in teaching and learning especially in Turkey. Evidence suggests that education sector is investing heavily on ICT projects but the implementation of these educational ICT projects lagged behind than in the business sector (Bingimlas, K., 2009) [10].

According to Polikanov and Abramova (2003) [35], cited in Saekow & Samson, (2011) [38]; although Internet access in Africa is among the lowest in the world, ICT in Africa is rapidly increasing. Many African states now have Internet access, with South Africa the leader in this regard in southern Sahara. They further argue that the majority of Internet users in Africa are rich males, who speak English or any other Western language and live in the cities.

However, many African countries still do not have adequate Internet connectivity due to a lack of infrastructure (Afshari *et al.*, 2009) [1]. This inadequacy in ICT infrastructure and connectivity reflects the pessimists' idea (Bingimlas, K., 2009) [10] that ICT will broaden the divisions that exist in the so-called 'digital divide' (Warschauer, Knobel and Stone, 2004, cited in Afshari *et al.*, 2009) [1] between the rich and the poor nations. ICT policies are yet to be developed by governments in Africa to ensure successful integration of ICT

in all spheres of society, especially in education (Kawooya, 2004; Kadzo, 2011; Ayere, Odera & Agak, 2010) [20].This also explains why it was very difficult to find ICT policies of African countries on the Internet.

As in many other countries in the world, the South African government maintains an optimistic view regarding ICT projects implementation in schools (UNESCO, 2009) [46]. ICT is perceived as a panacea to many educational, social and economical problems. In a speech made by President Thabo Mbeki in 2001, he said that South Africans must continue the fight for liberation against poverty, against under-development, against marginalization and information and communications technology is a critically important tool in that struggle (Imbizo for African Youth, 2001, as cited in the White Paper on e-Education (DoE, 2010:10) [15].

At this time, the state of ICT in South African schools was worth considering, since only 26.5% of schools in South Africa were found to be having access to computers for teaching and learning in 2002, according to the White Paper on e-Education (DoE, 2010:1-2) [15].

The South African government's response to address the digital divide was to establish the Presidential International Advisory Council on Information Society and Development in 2001 (DoE, 2004, cited in Park, *et al*., 2009) [15]. One of the council's key areas of focus was ICT in education, especially by addressing the digital divide (DoE, 2004) [15]. In addition, various other policy frameworks have been put in place to enable the integration of ICT into teaching and learning (Williams, 2010) [49]. These policies are dealt with in a number of documents published by the South African government, including the "Draft White Paper on e-Education (DoE, 2003) [15], the Revised National Curriculum Statement documents for Grades R-9 for the General Education and Training band (DoE, 2001) [15], the Draft National Curriculum Statement for Grades 10-12 (Schools): Computyping (Computer Applications Technology) (DoE, 2002a) [15] and the Draft National Curriculum Statement for Grades 10-12 (Schools): Computer Studies/Information Technology/Computer Science) (DoE, 2002b) [15]"

Like many other countries in the world, Kenya has developed National ICT Policy (2006). It sets out the nation's aims, principles and strategies for the delivery of Information and Communications Technology to improve the livelihoods of Kenyans (MoE, 2011b) [15]. Ministry of Education (MoE) introduced the National ICT Strategy for Education and Training (Farrell 2007). The ICT policy gives an opportunity for establishment grass root based infrastructure for knowledge sharing (Mureithi and Munyua 2009; MoE, 2011a). The ICTs in Education Options Paper (MOEST 2005) [29], discusses the ways in which information and communications technologies (ICTs) can be leveraged to support and improve the delivery of quality education for all Kenyans. It provides a comprehensive range of potential technologies to improve teaching, learning, and management. It is intended to enable the government of Kenya (GOK) to plan appropriate ICTs in education interventions as they move forward with the comprehensive Kenya Education Sector Support Programme 2005 –KESSP (UNESCO, 2005) [45]. This includes interactive radio instructions (IRI), use of computers in schools, development of ICT skills and the access of internet (Ayere, M.A.; Odera, F.Y. and Agak, J., 2010) [5].

According to Ayere, Odera & Agak (2010) [5], there is rich literature on ICT initiatives in Kenya both by GOK and nongovernmental organizations (NGOs). GOK and the U.S. Agency for International Development (USAID) have a joint commitment to improve education in Kenya in collaboration with Kenya's Ministry of Education. This is aimed at Accelerating 21st Century Education (ACE) by improving the quality of primary and secondary education through the effective use of information and communications technology (ICT). The initiative to establish a School Technology Innovation Center (STIC) in Nairobi will serve as a hub where education leaders and teachers access the latest information on technology solutions that are proven to enhance innovative teaching and learning, thus improving the skills needed by students to thrive in the 21 st century (Andiko, 2009) [4].

A report in the CIA World Fact book (2010) [41] shows that Kenya has government ICT Board whose main objective is to avail quality and affordable technical support to the Digital Villages to enable their smooth operation. The board has technical support focus points of standardized method for the testing and implementation of new software, the upgrading of hardware and the overall tracking of licenses and equipment. It also develops a collaborative relationship with the person responsible for Technical support and encourage them to include capacity building in the planning of future changes. The board works closely with the education institutions to ensure quality technical services as well as the internet providers.

From research, the attempt to integrate ICT in Kenyan secondary schools is faced by various challenges such as Lack of adequate number of computers in the schools, inability to acquire sufficient computers or update those which are obsolete is due to lack of finances, fast changing technology and high overhead costs, loaded curriculum which make it difficult to find time to prepare ICT teaching materials, Lack of a unified school curriculum in primary and secondary schools, resistance by teachers to use ICT in teaching and learning, the lack of government employed Teachers the schools are forced to hire thus draining the scarce resources which could have been used for upgrading the ICT facilities (Kidombo 2009, Oloo 2009) [21]. This is backed by the government report on ICT capabilities in secondary schools in Kenya (Kadzo, L., 2011) [19].

Blanskat, Blamire, kefala (2006) conducted a study carried out in national, international, and European schools With the aim to draw evidences regarding the advantages and benefits of ICT in schools achievements. It seeks to measure the impact of ICT on students' outcomes. The study also tried to establish a link between the use of ICT and students' results in exams. The findings are interesting: ICT has positive impact on students' performances in primary schools particularly in English language and less in science. Schools with higher level of e-maturity show a rapid increase in performances in scores compared to those with lower level.

In addition, schools with sufficient ICT resources achieved better results than those that are not well-equipped. There is a significant improvement on learners' performances. Finally, teachers become more convinced that educational achievements of pupils are due to good ICT use. In fact, high percentage of teachers in Europe (86%) states that pupils are more motivated when computers and Internet are being used in class.

Many pupils consider ICT tools very helpful in that it helps them to do assignments teachers see that ICT enables students with special needs or difficulties. It also helps to reduce the social disparities between pupils, since they work in teams in order to achieve a given task. Students also assume responsibilities when they use ICT to organize their work through digital portfolios or projects. In addition, the study showed that ICT has significant impact on teachers and teaching processes.

By virtue of government Interventions and training seminars organized in this regard, ICT tools stimulate teachers. Indeed, an absolute majority of teachers in Europe (90 %) claim to use ICT to do tasks, such as preparing lessons, sequencing classroom activities, etc. Therefore, teachers plan their lessons more efficiently. ICT also help teachers to work in teams and share ideas related to schools curriculum. There is also evidence that broadband and interactive whiteboards play a central role in fostering teachers' communication and increasing collaboration between educators.

The ICT Test Bed evaluation Underwood (2006) [44] provides an evidence that many teachers use ICT to support innovative pedagogy. It states: "New technologies that provide a good fit with existing practices, such as interactive whiteboards are first to be embedded, but others like video conferencing, digital video and virtual learning environments are now being incorporated, providing evidence of ongoing learning by the workforce. Training needs to continue to support innovative pedagogy." Both examples show that ICT is being integrated in a continuous process. Therefore, ICT can improve teaching by enhancing an already practiced knowledge and introducing new ways of teaching and learning. Transforming teaching is more difficult to achieve. Underwood (2006) "Changes that take full advantage of ICT will only happen slowly over time, and only if teachers continue to experiment with new approaches." This evaluation came from a teacher training seminar in IT during the ITMF project. It showed that teachers have not fully changed their use of ICT in education; however, most of them changed their way of thinking about the application of ICT in education. Teachers have increased their use of ICT in lessons where students look for information on the net and use it afterwards for subject specific areas, but hardly any use of ICT for class presentations. Nonetheless, teachers do not make use of ICT to engage students more actively to produce knowledge. Similarly, the e-learning Nordic study shows an increase in the use of ICT to teach but not to innovate teaching methods: "ICT generally has a positive impact on teaching and learning situations, but compared with the ideal expectations; the impact of ICT on teaching and learning must still be considered to +be limited" Ramboll (2006) [37].

Many teachers use ICT to support traditional learning methods, for example, information retrieval in which students are 'passive learners of knowledge instead of 'active producers able to take part in the learning process. In a document entitled teaching and learning with ICT, G. Galea (2002) [16] explains how ICT can promote teaching and learning. According to her there are two main reasons behind increasing the use of ICT in education in UK. Firstly, ICT can change the lessons' pace: she stated that children in modern society need to develop sufficient potentials and skills that enable them to take full advantage from the new opportunities that ICT offer. Second, there are groundswells of interest of academic researchers in UK in how technological tools can enhance the quality of teaching and learning in schools, and so help learners to achieve better outcomes.

Furthermore, it has been proved that new technologies have lots of benefits on the students. Ofsted (2002) [30] "ICT allow for a higher quality lessons through collaboration with teachers in planning and preparing resources". Students learn new skills: analytical, including improvements in reading comprehension Lewin *et al.*, (2000) [24]. ICT also develop some writing skills: spelling, grammar, punctuation, editing and re-drafting (Lewin *et al.*, (2000) [24]. Still new technologies encourage independent and active learning, and students' responsibility for their own learning Passey (1999) [33] ICT proves that students who used educational technology felt more successful in school they are more motivated to learn more and have increased self- confidence and self-esteem. It is also confirmed that many students found learning in a technology-enhanced setting more stimulating and much better than in a traditional classroom environment (Pedretti and Mayer-Smith 1998) [34].

From this research conducted by Blanskat, Blamire, kefala (2006) it is clear that schools with sufficient ICT resources achieved better results than those that are not well-equipped and that there are a lot of benefits in using ICT in education both to a teacher and to the pupils. He did not research on the challenges faced in implementation of ICT but concentrated on the advantages of ICT and its benefits in Education.

There is need for planning and communication to help ensure a successful implementation. In this column, we looked at the actual work typically performed in a complex implementation. However, your implementation may not be as complex, and you may not need to look at all of these areas. Nevertheless, there is usually a lot more involved than just throwing the final solution into the implementation environment. You need to account for the environment the solution will run in, as well as processes and training needs of the client community. If you think through implementation from a holistic approach and communicate well, there is a much greater likelihood that your project will end as a win.

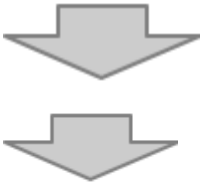
Let's look at the major steps associated with implementation. Note that many of these activities need to be completed ahead of time. You cannot start planning for implementation while you are actually implementing. According to Lee, (2004) [23] a successful implementation of any new system go through the following stages:

1. Prepare the infrastructure**.** Many solutions are implemented into a production environment that is separate and distinct from where the solution was developed and tested. It is important that the characteristics of the production environment be accounted for. This strategy includes a review of hardware, software, communications, etc. In our example above, the potential desktop capacity problem would have been revealed if we had done an evaluation of the production (or real-world) environment. When you are ready for implementation, the production infrastructure needs to be in place.
2. Coordinate with the organizations involved in implementation**.** This may be as simple as communicating to your client community. However, few solutions today can be implemented without involving a number of organizations. For IT solutions, there are usually one or more operations and infrastructure groups that need to be

communicated to ahead of time. Many of these groups might actually have a role in getting the solution successfully deployed. Part of the implementation work is to coordinate the work of any other groups that have a role to play. In some cases, developers simply failed to plan ahead and make sure the infrastructure groups were prepared to support the implementation. As a result, the infrastructure groups were forced to drop everything to make the implementation a success.

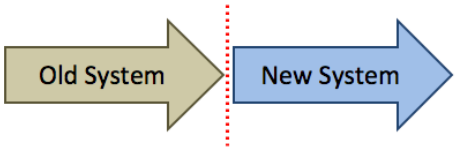
3. Implement training**.** Many solutions require users to attend training or more informal coaching sessions. This type of training could be completed in advance, but the further out the training is held, the less information will be retained when implementation rolls around. Training that takes place close to the time of implementation should be made part of the actual implementation plan.

The implementation of the new system occurs when the old system is replaced by the new one. There is a new of ways of implementing a new system...



Direct Changeover

The old system is stopped completely, and the new system is started. All of the data that used to be input into the old system now goes into the new one.



This has its advantages...

- Takes the minimal time and effort
- The new system is up and running immediately

But there are also disadvantages...

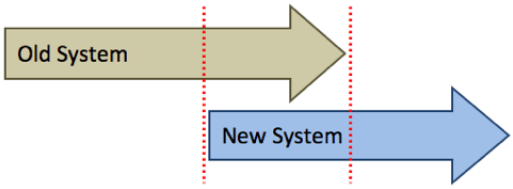
- If the new system fails, there is no back-up system, so data can be lost

Parallel Running

The new system is started, but the old system is kept running in parallel (side-by-side) for a while. All of the data that is input into the old system, is also input into the new one. Eventually, the old system will be stopped, but only when the new system has been proven to work.

The implementation of the new system occurs when the old system is replaced by the new one.

There is a new of ways of implementing a new system...



This is has its advantages...

- If anything goes wrong with the new system, the old system will act as a back-up.
- The outputs from the old and new systems can be compared to check that the new system is running correctly

But there are also disadvantages...

- Entering data into two systems, and running two systems together, takes a lot of extra time and effort

This has its advantages...

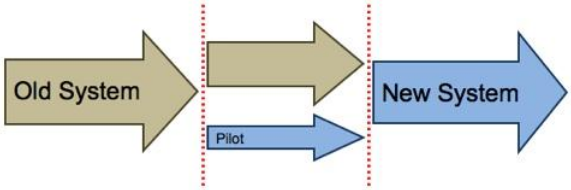
- Allows users to gradually get used to the new system
- Staff training can be done in stages

But there are also disadvantages...

- If a part of the new system fails, there is no back-up system, so data can be lost

Pilot Running

The new system is first of all piloted (trialled) in one part of the business / organisation (e.g. in just one office, or in just one department). Once the pilot system is running successfully, the new system is introduced to the all of the business / organisation.



This has its advantages...

- All features of the new system can be fully trialled
- If something goes wrong with the new system, only a small part of the organisation is affected
- The staff who were part of the pilot scheme can help train other staff.

But there are also disadvantages...

- For the office / department doing the pilot, there is no back-up system if things go wrong

According to Brummelhuis, A. C. A. (1995) [13], "Parallel adoption is a method for transferring between a previous (IT) systems to a target (IT) system in an organization. In order to reduce risk, the old and new system run simultaneously for some period of time after which, if the criteria for the new system are met, the old system is disabled. The process requires careful planning and control and a significant investment in labor hours".

This entry focuses on the generic process of parallel adoption; (real-world) examples are used for a more meaningful interpretation of the process if necessary. Moreover a process-data model is used for visualizing the process which is intended to provide a complete overview of all the steps involved in the parallel adoption, but emphasis will be laid on the unique characteristics of parallel adoption. Some common characteristics, especially defining an implementation strategy, that go for all four generic kinds of adoption are described in Adoption (software implementation).

Besides parallel adoption, three other generic kinds of adoption can be identified. The choice for a specific adoption method depends on the organizational characteristics; more insight on this topic will be provided below. The three other adoption methods are: Big Bang Adoption, Also known as

Direct Conversion, slam dunk, or cold-turkey strategy, Phased adoption and Pilot adoption.

- Big Bang Adoption/Plunge Adoption: A big-bang adoption entails transferring the entire organization from the old system to the new system in an instant changeover. This is the cheapest option but if the new System fails, the organization is in big trouble. It also opens risks for the system not to be accepted by its users. However, this may be the only approach to take when the two systems cannot coexist or activating the new system is an emergency.
- Phased adoption (Also known as gradual conversion): In phased adoption implementation, the organization is gradually transferring to a new system in different phases, per module or sub-system. Some systems are incapable of being introduced in pieces as it is too reliant on the whole system. Using the phased adoption has less risks, but causes the most disruptions due to it taking the most time to transfer from the old system to the new.
- Pilot adoption: The pilot adoption method is used for large organizations that have multiple locations or largely independent departments. The new system is introduced in one of the locations or departments and extended to other locations or departments over time. (limited boundary if a new system is a failure) (Turban, 2002) [43].

There are several instances when parallel conversion cannot be considered a viable conversion strategy. First consider if the new system contains significant schema changes. Data elements required by one system that are not being populated by the other can lead to at best data inaccuracies and at worst data corruption. Another concern is if the system relies on consumer off the shelf technology (COTS). If a COTS vendor's documentation states that more than one application cannot share the same database, then parallel conversion is not an option. An example would be Oracle's Siebel products. Other COTS products may also place restrictions when patches or major upgrades require unique license keys. Once applied they may make database changes that might cause the application to falsely detect a parallel system running against the same database as an attempt at getting around licensing controls and thereby disable the system.

There seem to be little conventions regarding the process of parallel adoption. Several sources (e.g.: Turban, 2002, Eason, 1988, Rooijmans, 2003, Brown, 1999) [43], do not use a single process-description name. The term *parallel adoption* is denoted in these sources, although consistent per source as: parallel conversion, parallel running, shadow-running, parallel cutover and parallel implementation. This appears to be the case because a generic description of the process does not need a distinct classification. There are a quite some standard implementation methods, where different adoption techniques are described but often in a practical context; real-world case scenario or a more comprehensive set of implementation techniques like Regatta: adoption method, SIM and PRINCE2. In general, parallel adoption can best be seen as a Systems Engineering method of implementation of a new system.

In principle, the parallel adoption method is different from the decision to change a system in an organization and can be seen as one possible mean to achieve that goal. However, there are quite some factors that are being taken into account in determining the best implementation strategy. Moreover, a successful implementation can depend to a big extent on the adoption method. Lee, (2004) [23].

The activities are divided in four main phases:

- **Define implementation strategy:** That deals with the kind of implementation strategy should be executed.
- **Pre-implementation**: Which has to do with constructing a planning of all aspects and requirements involved in the implementation.
- **Prepare organization:** The organization should be prepared properly according to the previous phase.
- **Conversion** deals with the actual conversion process and closing the conversion process; proceeding with the new system.

2.2 Zambian perspective

Continued development of the learning process involves the usage of new educational approaches and accompanying technologies. Trends in modern education are associated with changes in the role of participants in the learning process. Teachers explore and apply various means to improve the interactivity and involvement of learners not only as passive listeners, but as active participants in the training process. Students are actively involved and are responsible for their own learning. The development of ICT is a prerequisite for the existence of many diverse technical resources that can be used in training. In front of teachers stands the important task to choose those means that most will reflect the specifics of the subject area and the characteristics of learners. The idea of the active implementation of e-learning was adopted in Information and Communication University in 2003. More and more teachers from different departments and faculties of the University consider E-learning as a means of achieving a new model of teaching and learning. Since then they continually explore different ICT tools that affect various aspects of teaching. We implement various ICT tools in our practical activity seeking a suitable model for the realization of E-learning, consistent with the specifics of curriculum subjects. The main goal of the current work is to summarize the results of our studies and present some specific ICT tools used in learning process. The work distinguishes some of the main advantages of ICT tools, which have become a reason for our choice. It sets out some performance after their application in our teaching practice.

Creswell, J. W. (1994) [14]. "E-learning is a learning process based on the usage of computer and communication technologies". There is constantly development of electronic tools that can be used to realize each stage of training– preparation of the learning materials, their delivery to the learners, the processes of learners' evaluation and knowledge control. Each of these tools allows the implementation of a specific model of E-learning with different form and degree of learners' activity. The presentation of multimedia information (text, graphics, audio and video materials) is one of the important advantages of E-learning. Based on modern information technologies multimedia elements can be used in creating electronic learning content. In E-learning the learning content is actual, dynamic and accessible. There are opportunities for easy and quick actualization of the learning materials and adding new ones. E-learning includes wide range of activities and assignments which develop different students' skills. Learners have access to many learning resources through remote multimedia databases. E-learning presumes enhanced communication (synchronous and asynchronous) and interaction between participants in the

learning process in various forms.

E-learning is an integral part of training. It can be realized in various forms using different technologies. SER (1997) [39]. "E-learning is a limitless source for: the expansion of interactive activities used by teachers; innovating teaching and learning; stimulating students' activity and improving the communication between teachers and learners". E-learning can be used as a complement to the traditional training. All these aspects lead to increased efficiency of training. There are many different technologies and tools for implementing e-learning. We consider them as aids to ensure the learning process, which can increase its effectiveness. Our efforts as teachers are directed to the selection of appropriate means consistent with the features of the studied subjects and the specificity of the trained students. The presented examples of application of ICT in the learning process work well in Information and Communication University. The usage of free software stimulates the interest to information technologies and motivates teachers and students to improve. The integration of various ICT tools into one system is a very effective approach that covers all phases of the learning process.

However, Zambia has not yet reached this stage where a teachers use video conferencing, Moodle, and other forms of e-learning to teach in a classroom situation because of many factors that this paper has come up with. So we could safely say as a nation we are very far in implementation of ICT in schools. What we say is ICT is just a tip of the whole course because here in Zambia we have just started using computers for social media and a little of online transactions which are done in banks and other organizations. The implementation of ICT in schools that is talked about is just the use of computers to store data and type. But also this has meet a lot of challenges as this paper will endeavor to elaborate. The only universities that I have seen trying to implement ICT using e-learning in Zambia are Information and Communication University and Cavendish University.

3. Methodology

Research Design in order to provide accurate account of the situation of the implementation of ICT in education and find a way of improving it, the study will use a descriptive design. The research will use both quantitative and qualitative approaches to describe the existing situation.

It will be participatory study because it aims at involving the respondents in the process of research. To collect data it will use interviews, observations, questionnaires and group discussions. To obtain information, the researcher will establish good relationships with respondents by working in non-directive manner aimed at making respondents feel free to contribute to the discussion.

3.1 choice of study area

The choice of Chipata district did not however make other district less important, but it was just appropriate because of the following factors: Easy transport, availability of communication network facilities, lack of enough funds to go to other towns and accommodation.

3.2 population of study

Eastern Province is one of Zambia's ten provinces. The province lies between the Luangwa River and the border with Malawi to the east and Mozambique to the South, from Isoka in the northeast to just north of Luangwa in the south. The provincial capital is Chipata. The province's population was 1,592,661 in the 2010 census - about 12% of Zambia's total population. The population of study is made up of teachers, members of the community, provincial education officer, district board secretary, pupils, and head teachers.

3.3 sample population

The sample will consist of fifteen (33) teachers, three(3) from Magazine, three(3) from Gondar, three(3) from Mpezeni School three (3) from Hillside girls, three(3) Chizongwe and 3 from Anoya Boys three(3) Katopola School three(3) from Nadalisika School, three (3) Chongololo Private School, three (3) Munga School, three (3) Chipata Day Secondary School, 10 members of education administrators and seven(7) pupils. A total of fifty (50) questionnaires were distributed.

3.4 unstructured interviews

The Unstructured interviews with some education officials were used in order to obtain supplementary information. The responses was collected, arranged, analyzed and filtered so that only useful responses useful to the test of hypothesis will be used.

3.5 observations

This was done by observing teachers conducting their lessons and sees how many pupils in each class. Teachers and learners were told in advance that an observer was to come to observe the lesson. At the end a review was done by looking at the way the lessons are conducted and how preparations are done. Any challenges observed was told to the teacher involved and suggestions on how to solve the problem was relayed to the Head teacher in-charge.

3.6 group discussion

Group discussions were held with learners to find out from them how they felt about how ICT is implemented in Chipata District. Their responses enriched the data base to be used to write a good dissertation.

3.7 instruments for collecting data

The principal instruments for data collection was self-administered questionnaires using open ended and closed questions, group interviews and group discussion.

3.8 Procedure for data collection

a) Questionnaires

In the study, the researcher prepared twenty (50) questionnaires for respondents which were distributed as follows:

Ten (10) questionnaires for head teachers of the schools that were sampled, twenty three (23) questionnaires were completed by teachers, five (7) questionnaires were completed by pupils, three (10) questionnaires were completed by the District Education Board staff; one (1) questionnaire was completed by the DEBS and one (9) by the ESOs and SESOs.

b) Interviews

The researcher conducted interviews with teachers and pupils in some of the sampled schools where questionnaires were distributed. The total number of respondents interviewed was

ten (10); that comprised five (5) teachers and five (5) pupils all of them were randomly selected to participate in the study

3.9 data analysis

The researcher analysed data both quantitatively and qualitatively. The statistical package (STATA) was used to analyse the quantitative data that was collected for the study. Furthermore, quantitative data that was collected was systematically entered on Microsoft excel sheet, coded and later interpreted into tables and graphs. The qualitative data that was collected was analysed theoretically under their respective emerging themes and sub themes. Data was also interpreted using descriptive statistics in form of frequencies and percentages.

3.10 Triangulation

The researcher cross checked and validated data obtained using the different forms of data collection instruments which included data obtained using the questionnaire to that which was obtained through the interview schedules and from the focus group discussion in order to understand phenomena better (ibid, p. 167) [17]. Triangulation helped to test the reliability of the results obtained by considering issues not only from one perspective rather by employing a wider choice of techniques to obtain the desired results. For instance, both qualitative and quantitative methods were used.

Theoretical frame work

Procter, M. (1993) [36], "A theoretical framework is a collection of interrelated concepts, like a theory but not necessarily so well worked-out". A theoretical framework guides your research, determining what things you will measure, and what statistical relationships you will look for. Theoretical frameworks are obviously critical in deductive, theory-testing sorts of. In those kinds of studies, the theoretical framework must be very specific and well-thought out. There is a gap between the rich and the poor people that existed when time came to take their learners to school. The gap theory used in the study suggested that the rural schools would fail to implement ICT to children but the urban schools would do that without any problem. This could lead to underdevelopment and dependence syndrome in the country by the rural schools. In this research we are going to measure the challenges that affect the implementation of ICT in primary and secondary schools. We are also going to measure ICT literacy levels, impact of ICT on education standards among girls and boys. This will be purely qualitative research based on quantitative research that gives us figures of the responses.

According to Lee, (2004) [23] the implementation of any project should go into phases for it to successful. Before implementation there is need to have all the resources available needed to implement it available i.e. human resource and equipment together with training materials like books, computers, overhead projectors, etc.

3.11 Ethical consideration

To make collection of data easier as per obligation in research, consent to carry out this study was sought from pertinent authorities at the Information and Communication University Zambia, the District Education Board Secretary's Office and the Head teachers' of respective Primary Schools. All data collected during this study was used exclusively for the intention of the study, and was kept strictly as a secret. Approval was sought from respondents and no informant was forced to participate in the study. Moreover, names of the respondents and institutions were not disclosed in any way. Furthermore, the researcher fully explained to the subjects in advance and "de-briefed" them afterwards.

4. Presentation of the findings

The previous chapter presented the methodology that was used in the study. This chapter presents the background characteristics of the respondents and further presents the findings of the study on 'the impact of ICT implementation on the pupils' academic performance in selected schools in Chipata District' addressing the attitude of the pupils towards ICT and; the effect of ICT on pupils' academic performance and the measures to be undertaken to improve the implementation of ICT.

Respondents' background characteristics

Table 1: Distribution of respondents by institution

Mpezeni school	16%
Chipata school for continue edu.	5%
Anoya boys	4%
Chipata day secondary school	8%
Debs office	9%
Chizongwe tech school	5%
Katopola school	8%
Nadalisika school	15%
Hillside girls	4%
Chongololo private school	14%
MUNGA SCHOOL	12%
TOTAL	100%

Table 1 above shows the institutions where the respondents were drawn. It shows that sixteen percent of the respondents (16%) were from MPEZENI SCHOOL, five percent (5%) were from CHIPATA SCHOOL FOR CONTINUE EDU. and another four percent (4%) from ANOYA BOYS DAY SECONDARY SCHOOLS. The table further shows that eight percent of the respondents (8%) were from KATOPOLA SCHOOL, nine percent (9%) were from the DEBS' office, five percent (5%) from CHIZONGWE eight percent (8%) from CHIPATA DAY, while fifteen percent (15%) came from NADALISIKA SCHOOL, HILLSIDE GIRLS four percent (4%), CHONGOLOLO PRIVATE SCHOOL fourteen percent (14%) and twelve percent (12%) came from MUNGA SCHOOL.

Following the researched data, it is clear that out of the total number of fifty (50) respondents 27 (54%) were female while 23 (46%) were male. Therefore, there were more female participants than male although the sampling was generally random for most of the participants except for the administrators who were selected purposively as a result of the positions they held. Perhaps the reason for having more female respondents could be that there were more female teachers in Chipata district than male teachers being an urban district.

Following the analysis of the respondents' ages, the study revealed the ages were between 11 and 60 years and broken down as follows; Participants who were between 11 and 20 years represented forty percent (40%) of the total sample size.

Those who were between 21 and 30 years represented four percent (4%) which had probably the least participants. Respondents who were between 31 and 40 years represented twelve percent (12%), while twenty eight percent (28%) were between 41 and 50 years and another fourteen percent (14%) were between 51 and 60 years old. Furthermore, two percent (2%) of the respondents did not declare their ages hence displayed as N/A on the table. Forty percent of the respondents were in the lowest age range showing that most of the pupils were between 11 and 20 years old.

Out of the total one hundred percent, the highest percentage of respondents comprised the pupils who represented forty two percent followed by subject teachers whose total was twenty percent. Furthermore, deputy head teachers totaled ten percent, head teachers, six percent, guidance teachers, HODs and senior teachers totaled four percent each while the rest of the respondents who included the DEBS, ESO, District Guidance coordinator, PRCC and section head represented two percent each. Despite the percent of pupil respondents being high, the number of respondents holding administrative positions which included head teachers, deputy head teachers, HODs, senior teachers, the DEBS, ESO and the District Guidance coordinator was equally which meant that the respondents had wide experience in teaching, conducting and managing examinations.

Table 2: Respondents' ICT alleged levels of implementation in Chipata District

Level of ICT implementation	Response percent (%)
Very high	2%
High	56%
Low	24%
Quite low	4%
N/a	14%
Total	100%

Following the results of the study tabulated in figure 4.1.2, two percent of the respondents said that ICT implementation levels were very high, fifty six percent of the respondents said ICT implementation levels were high, twenty four percent further said they were low while four percent declared ICT implementation levels were quite low and fourteen percent of the respondents did not say anything concerning the ICT implementation levels in Chipata District. Despite fourteen percent of the respondents did not express their views whether ICT implementation levels were high or not, the table shows clearly that ICT implementation levels were still a problem in our country' implementation system because, no matter what the respondents could have said whether very high, high, low or quite low, it was evident that the problem of ICT implementation was far from being over. This was evidenced by few or no computers found in some schools. In addition some schools do not even have a teacher and electricity to say the least.

Table 3: Respondents' views on the influence of teaching materials on pupils' academic performance

Response	Percent (%)
Yes	34%
No	54%
N/a	12%
Total	100%

The study further analysed what the respondents said about the impact of inadequate teaching materials in ICT. At least thirty four percent of the respondents denied the fact that inadequate teaching and learning materials had any influence on pupils' academic performance. Although twelve percent of the respondents did not give their views on the matter, the majority of the respondents comprising fifty four percent of the total number of participants said that the inadequate teaching and learning materials did not have any influence on the pupils' academic performance.

Table 4: shows the perceived challenges of ICT on Pupils' academic performance in Chipata.

Challenges
Lack of training materials
Lack of ICT teachers
Over enrolment
Low numbers of computers
Lack of ICT infrastructure
Lack of electricity
Poor funding for implementation of ICT

***Source*:** Field work, 2015

From the questionnaires issued to pupils it was discovered that 90% of schools in chipata do not have computers, ICT teachers, ICT books and computer infrastructure in general.

75% of the questionnaires given to school officers reviewed that the pupil–teacher computer ratio is 1 to 18. 25% of school officers said that the pupil–teacher computer ratio is 1 to 5.

The head teacher at Walela School reviewed that because of few computers at school they took two days to write ICT exams and this was the same scenario in many schools in Chipata urban and rural areas.

The interview with the DEBS reviewed that the ICT results were very bad and attributed this to lack of training materials, ICT teachers and computers in schools. He suggested that this year the schools should make a deliberate policy of buying at least 10 computers every month from the government grant given. He also reviewed that the government is doing everything to recruit many ICT teachers this year to improve the results this year 2016. But the challenge is that not many colleges have trained teachers in ICT courses. It is for this reason that the PEO eastern province has recruited Lecturers in ICT to help beef up the numbers of ICT teachers in eastern province.

5. Discussion of findings

5.1 lack of training materials

The majority of the respondents said Lack of training materials was common among schools which make it very difficult for them to help in the implementation of ICT in Chipata. For any school to implement ICT easily they need ICT training materials without which it is practically impossible to implement ICT in schools. Therefore, many respondents said that Lack of training materials had a negative effect on pupils' academic performance and was a recipe for failure in ICT subject. Some respondents further said, 'last year many pupils fail in ICT subject because of lack of books in ICT and that they did not learn it but they were examined; ' For instance, one respondent said from Katopola,

"The performance of some of the pupils ICT was very low because we do not have books, computers, and teachers to teach us, we also don't have a computer Laboratory".

5.2 Lack of ICT teachers

Respondents further said they do not have ICT teachers at their school. They did not learn anything on ICT the whole year apart from a few tips from the head teacher who had a laptop and was taught ICT as a course during his degree studies. For pupils to do better in ICT there is need for trained teachers, books, computers and other things like computer laboratory. It was observed some of the learners were very keen to study ICT and did tuitions in town internet cafes and managed to pass ICT examinations.

Furthermore, one respondent said;

"The government was in a harry to implement ICT in schools but they don't have infrastructure and teachers and training materials."

Perhaps the assertion could also contribute to the pupils' loss of concentration or focus.

5.3 Poor academic performance

This was another consequence of trying to implement ICT when not read was poor academic performance which respondents talked about. For instance, some respondents said pupils who were known to be generally good in class failed ICT examinations because they lacked self-confidence and were swayed by the fact that they were not taught which distracted their attention. Moreover, during the examination period, it was observed most pupils spent much of their valuable time looking for ICT past paper instead of reading and preparing for the examinations

Furthermore, poor performance during ICT examinations left the teachers not only amazed but also disappointed because pupils who normally performed well in class were the ones who obtained the lowest grades.

One teacher said:

"*If it were possible can the government use a deliberate principle to take on all Business Studies teachers back to school to do ICT studies so that the implementations can be enhanced and be achieved otherwise these will be mere rhetoric's from politicians but implementation will never be achieved and our learners will keep on failing ICT subject".*

5.4 Over enrolment

The study further revealed that over enrolment is another challenge faced by the government to implement ICT subject which is a practical subject. The schools are highly over enrolled such that teaching is a very big problem. The classes are just unmanageable for ICT subject.

Thus one respondent said

"a class needs at least 25 pupils to learn ICT if results are to be better, unlike the status quo we have 65 pupils in class to be taught ICT on 7 computers"

While another respondent said

"The furniture is not available for learners and what they do is stand whilst typing this makes them get tired easily and not concentrate, in addition there is always scramble for computers."

5.5 Low numbers of computers

The respondents also observed that Low numbers of computers in schools has contributed to poor implementation of ICT in Chipata District. Some schools do not have computers and books in ICT while others have less than the acceptable number of computers to teach effectively.

5.6 Lack of ICT infrastructure

Most of schools do not have ICT infrastructure like computer laboratory making it very difficult to implement ICT in Chipata district. The first thing to do to have a good ICT implementation is to build go infrastructure to facilitate successful ICT implementation. Therefore, every province, district and institutions had to come up with strategic plans of how they were going to solve the problem of infrastructure to help the government implement ICT successfully.

5.7 Lack of electricity

Many schools in rural areas are mostly disadvantaged because of the remoteness of their areas where ZESCO cannot reach with electricity. This is one problem that needs to be solved first if ICT implementation is to be easily implemented. Many schools have may be 3 or 6 computers but they do not have electricity. So this makes it practically impossible for them to help implement ICT in their school. Some head teachers have used initiative by buying solar power generators which are doing very fine but this is a sacrifice as schools are not well funded in rural areas. When asked what and how much institutions in Chipata districts were involved in terms of implementation of ICT. The majority of the respondents stressed the fact that administrators, supervisors, implementers and teachers were thoroughly sensitized on the importance of ICT in education and many are encouraged to go for further studies in ICT so that ICT can be easily be implemented.

5.8 Poor funding for implementation of ICT

Some of the participants in the study proposed that the funding of ICT implementation was cardinal in the implementation of ICT. Therefore, the government of Zambia must aim at increasing the funding to implement ICT. Some respondents said the government of Zambia knows very well that funding is very poor to this effect but why they cannot do the right thing by doing first things first is what is not known. Furthermore, respondents suggested those in planning for the implementation should be scrutinized to see if they are competent if not they be replaced by competent ones.

One respondent thus said:

"The government must first provide funding, infrastructure, equipment and trained personnel before starting this mammoth task of implementing ICT in Zambia."

It is clear that if the government would do its homework in this area this problem of implementation will be history.

6. Summary

The study investigated the challenges faced by the government in implementing ICT in selected secondary and primary schools in Chipata district. The findings showed that challenges were influenced by the government's attitude toward Implementation of ICT. For instance schools were not well funded, the government was in a hurry, there are few ICT trained teachers, schools do not have computers, training materials, equipment, Laboratories, pupils were not adequately prepared for coming new subject so even them are also making it difficult to implement ICT in schools. Therefore, this had a negative impact on both the school teachers and the

pupils taking the exams. The study further revealed the impact of this quick move by the government to implement ICT in Zambia that many schools did not manage to write this examination as scheduled making the Minister of Education to nullify ICT examination. These effects had a negative impact on the socio-economic development of the nation and lowered the nation' academic integrity.

Respondents thus suggested some measures could help the nation to overcome these challenges as follows: electrifying all rural schools, provide computers, training materials, trained ICT teachers, build many ICT universities, take teachers for ICT refresher courses, do a phased implementation method, carry out a research before implanting ICT in schools, provide good funding to schools to implement ICT easily

6.1 Mearsures to solve these challenges of implementing ICT in chipata

The respondents were aware of the measures the government has put in place to curb the challenges in the implementation process such as provide funding, infrastructure, equipment and trained personnel. However, some respondents thought much more needs to be done. For instance, the implementation should be in phases, the implementation should first be piloted in rural areas and in urban areas then implement it all over the country. The idea is good but the method of implementation has failed the government they needed to conduct a thorough research before implementing it. It failed last year it will also fail this year because no practical measures have been implemented so far to help solve the challenges faced by the government in implementing ICT in schools. One teacher who did not what to be named said:

"Last year we had 3 computers and wrote ICT exams for four days but no one past the examination in ICT, even this year the status quo is the same so the results can be predicted. This has made learners to abscond ICT lessons because even teachers teaching it are not trained".

6.2 Building ICT universities

Furthermore, respondents proposed government should build a number of universities training teachers in ICT and introduce ICT major in already built universities while taking teachers for fresher courses in ICT as a short term measure because the disaster we faced last year in ICT national wide was a shame to teaching fraternity where an examination was conducted for 3 to 4 days in notable schools even in Lusaka capital city of Zambia.

6.3 Build laboratory facilities in rural and urban areas

Many schools in Chipata do not have computer labs making it difficult to teach computer effectively. Some computer Labs that are there cannot be accepted as Laboratories because they don't meet the standards. For example one computer lab we visited had no air conditioner, no computer chairs, no printer, no scanner, no overhead projector, computer were not networked, to mention just a few. Dust was all over, the computers were not covered, no UPS, food was prepared at one Conner in the room making computers get damaged every day

6.4 Impact of ICT on teachers and pupils performance

The respondents reviewed that ICT has made teachers and pupils performance to go up. They said teaching has now become easy as learners have enough information already. When learners are given syllabus they go ahead research on their own and are always ahead of the teacher. The teaching methodology currently is pupil centered not teacher centered as it were previously. Learners made study groups where they share information both electronically using whatsapp and facebook. I C T helped learners in almost all courses as they download data on any question on the internet. In addition there a lot of tutorials on YouTube on all subjects. This made learning simple and easy whereby learners can even learn from home without being in contact with teachers.

The data from the field shows that access to information through ICT has been made easy. This can be done through the internet where pupils easily research information on the internet. For instance when a teacher gives learners home work they can google it and easily find the answers.

Learning of other subjects has become easy

25% of the teachers say ICT has helped in increasing Enrolment in schools, 76% of the teachers interviewed say teaching has become easy, 45% of pupils and teachers interviewed say that training materials have become readily available on the internet to download, 45% of teachers also say teaching can now be done through the internet using e-learning techniques, 80% of the teacher reviewed that the role of a teacher now is as facilitator not a teacher as it were.

Teaching can be done through e-learning. 80% of the teachers say accessibility to materials has become easy so learners not need notes but are told to download data on different websites given to them by the teacher in charge. Lastly 65% of teachers and learners reviewed that learning and teaching other subjects has also been simplified by ICT subject.

Table 5: Factors to consider in effectively implementing ICT in chipata district

Training materials	80%
Computers and other accessories	78%
Availability of electricity	90%
Availability of ICT teachers	70%
Availability of ICT colleges	50%
Availability of ICT infrastructure	42%
Availability of ICT implementation fund	45%
Availability of effective and efficient managers of the ICT implementation process	40%

***Source*:** field work 2016

The table above reviews the responses from teachers and pupils on the factors to consider to effectively implementing ICT in Chipata district. 50% of the respondents said that ICT colleges are not enough, 90% said that electricity is another factor that need to be looked at to effectively implement ICT in Chipata, while 78% said that computer and other accessories should be considered before you implement ICT. 70% said that availability of teachers is another very important factor to consider before implementing ICT in Chipata. Other factors are self-explanatory on the table above.

7. Conclusion

The implementation of ICT in schools has been affected negatively due to lack of ICT teachers, computers, ICT books, and prior preparation by the government. It is clear that a research was not conducted before ICT was introduced in

schools. It is also clear that the government was in a hurry during the implementation of ICT in schools in Zambia. This brought a national outcry from not only the teachers but the pupils as well. It would have been successfully implemented if parallel method of implementation was used. This is where both systems are used side by side until the new system of education is successful that is when they can drop the old system. In addition a pilot method of implementation would have been better where the government would have just started with one part of the country and after seeing that it is successful that when it was to be implemented nationwide. They would have started with implementation of ICT in rural areas then in urban areas. The information provided by this paper will provide a basis on which to analyze and specify international support and cooperation from development partners on ICT projects. Also information will be used to produce guidelines that the governments can use to help define their needs and agendas with regard to government ICT implementation and use. In addition it will provide a basis for assessing good practice for ICT implementation in government. Lastly, it will contribute to the body of knowledge on ICT implementation.

8. Recommendations

- The government should buy many computers for schools to cope with this increase in enrolments
- The government should employ many ICT teachers to cope with this increase in enrolments.
- The government should increase the funding in ICT to primary and secondary schools to meet their needs.
- The government should buy a lot of ICT training materials for the institutions to effectively implement ICT in schools.
- The government should furnish the computer labs with computer programs and equipment regularly to cope with the changes in technology.
- The government should upgrade the labs regularly to meet the education standards.
- The research on the number of schools, ICT teachers, training materials, computers in schools should be conducted before implementing ICT.

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