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Emerging factors affecting the teaching and learning of ICTs in secondary schools in Kasama District

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Abstract
The researcher sort to investigate the effective teaching of ICT in secondary schools in Kasama district following the recent introduction and popularization of the subject backed by the ICT national policy. The Ministry of General education is implementing this policy through offering the subject to school pupils. The manner in which the subject was introduced called for investigation of how the implementation was being done by establishing which factors are positively and negatively affecting the teaching and learning of the subject, hence this study.
Facts presented in this study review that there are technical and human factors that are impacting either positive and negatively on the effective teaching and learning of ICT in secondary schools in Kasama district namely:
Rigidity of school managers to embrace contemporary approaches in the teaching of the subject to learners such as not being flexible in allowing pupils to own and use the ICT gadgets in school which could allow teachers to teach learners using a more pupil personalized and adaptive approaches.
Inability for the schools to procure and distribute internet facility across the school compass for pupils to research off this could only be possible if the pupils were allowed to own and use the ICT gadgets in school but this was not the case. This impeding factor need to be seriously addressed by the ministry of general education.
It was also reviewed that a number of teachers assigned to teach ICT in schools were not ICT specific trained and could not effectively address the challenges in the detaching of the subject adequately.
The other notable factor reviewed was the inability of the teachers to adopt the most effective ways of teaching the subject such as field trips, guest speakers, and use of e-learning systems which was off confounded by the problem of learners not having gadgets to support this strategy. However, this was more of the attitude than the technical deficit on the part of teachers.
On the other hand it was found that administrators were more willing to support teachers in the area of CPD activities in order to equip teachers with more relevant knowledge and skills in the teaching of the subject.
The study is hereby concluded by stating that despite all the challenges poised in the teaching of ICT in secondary schools, there are is a good will and best efforts schools are making to effectively implement the ICT curriculum if only the noted challenges or emergent factors are looked into and addresses by the relevant authorities.

Keywords: ICT, CPD, Kasama district

1. Introduction

1.1 Background of the study

Zambia like any contemporary nation has integrated the use of ICT in every aspect of her economic, social and educational activities. This is evident in almost every business transactions such as e-banking, e-learning.
Though ICT is still at its basic levels compared to developed countries, the Zambian government has in the recent past and so continues to promote the integration of ICTs in almost all developmental sectors and this is evidenced by the development of the ICT policy to guiding the use and implementation of ICTs in all developmental sectors, education inclusive.
In March 2007, the late President Levy Patrick Mwanawasa (SC) launched the ICT policy. In his address to the public, he emphasized the creation of innovative, market responsive, highly competitive, coordinated and well-regulated ICT industry. The policy identifies three goals in ICT being, to enable a diversified and export-oriented economy, to improve livelihood and protect the vulnerable though service delivery and to provide an efficient and effective public sector (Shafika 2007) [14].
The policy also recognizes the need to face the challenges such as, low levels of ICT literacy, high cost of technology acquisition, "Brain drain" resulting in considerable loss of skilled personnel as well as inadequate institutional capacity among others. According to Shafika (2007) [14], the Zambia National ICT policy gave impetus to the teaching of computer studies which had been introduced in 1998 as a subject in public schools to complement the private schools who were already teaching learners that were graduating with computer literacy and more competent in dealing with the ICT demands.
It important to note that government thorough the ministry of education has been implementing ICT policy, teaching learners from pre-grads to tertiary levels.
It is from this background that this study was conducted to try

and show how the implementation of the teaching of ICTs in secondary schools is being implemented.

1.2 Statement of the problem

Despite government through various departments such ZICTA putting more effort in supporting the effective implementation of the teaching of ICT by providing adequate computer facilities to schools, there were other underlying factors that were perceived to be affecting the effective teaching and learning of ICT in secondary schools in Kasama district. Siting Phiri and Silumbe, (2015) [10], their findings review that a study of 22 schools surveyed showed that 90% of the teachers that teach ICT have not been taught how to teach the subject. Others challenges include inadequate ICT infrastructure and equipment.

It was against this background that this research was conducted to determine which factors were affecting the teaching and learning of ICTs in secondary schools in Kasama District.

1.3 Purpose of the study

The purpose of this study was aimed at highlighting the emerging factors that were affecting the effective teaching and learning of ICT and come up with appropriate interventions that would be implemented for effective teaching and learning of ICT in Kasama secondary schools.

1.4 Research objectives

The general and specific objectives were:

1.4.1 General Objective

1.4.1.1 To establish how teacher and pupils in secondary schools in Kasama District were affected by emerging factors in ICT in the teaching and learning of ICTs

1.4.2 Specific objectives were

1.4.2.1 To identify emerging factors faced by teachers and learners in the teaching and learning of ICT in secondary schools in Kasama District.

1.4.2.2 To assess of how emerging factor in ICTs affected the teaching and learning of ICT in secondary schools in Kasama District.

1.4.2.3 To identify appropriate approaches for effective teaching and learning of ICT Secondary Schools in Kasama district.

1.5 Research questions

The research questions were:

1.5.1 What emerging factors affect the teaching and learning of ICT in Kasama district?

1.5.2 To what extent was the effective teaching of ICT in secondary schools in Kasama District?

1.5.3 How best would the teaching and learning of ICT in secondary schools in Kasama district be conducted?

1.6 Significance of the study

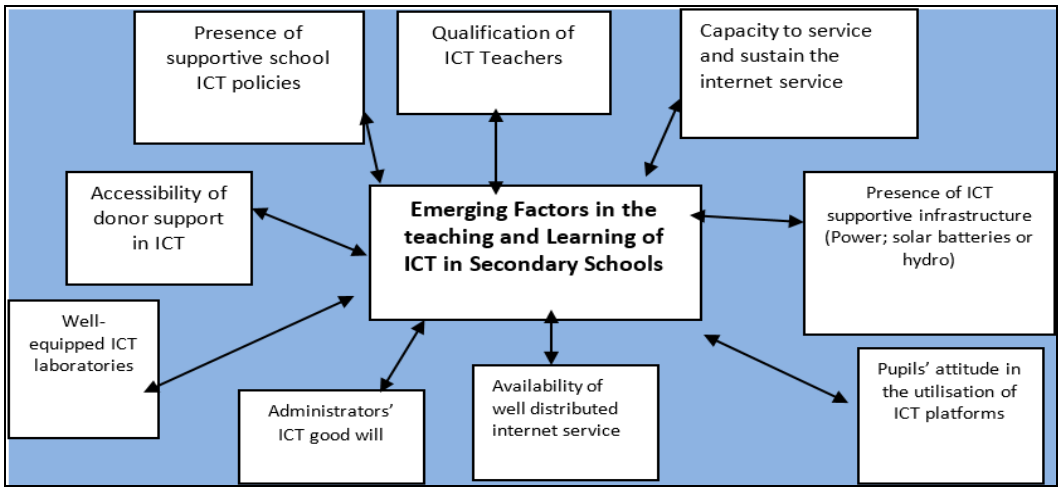
Findings arising from this study were aimed at showing how the emerging factors in ICT were affecting the teaching and learning of ICT in secondary school in Kasama District. Further, the study brought out effective approaches to inform education stakeholders in coming up with effective interventional strategies in the teaching and learning of ICT in secondary schools.

1.7 Delimitation and limitation of the study

The study was confound within secondary schools located in Kasama urban district. At the time of this study, there was no literature resulting from similar studies conducted within same geographical boundary to inform this study. As a result, findings of this study will need further research for authentic generalization of the findings. Nevertheless, the findings arising from this study have helped in generating data that has helped in highlighting the emerging factors that affect the effective teaching of ICT in secondary schools in Kasama district and will saved as a basis for further research.

1.8 Conceptual framework

The following was a conceptual framework that guided the study in gathering data that tried to highlight the emerging factors affecting the effective teaching and learning of ICTs in secondary schools in Kasama district. The model was developed using ideas from the following website: https://www.slideshare.net/ludymae/chapter-6theoretical-conceptual-framework



https://www.slideshare.net/ludymae/chapter-6theoretical-conceptual-framework

Fig 1

2. Literature review

According to Zacode (2010:16) [19] ICT is defined as "Information and Communications Technology which is an encompassing term that comprises any communication device or application for example radio, television, cellular phones, computer and network hardware and software, satellite systems and just to mention a few." In addition, it also includes various services and applications associated with them, such as videoconferencing, teleconferencing and distance learning.

Other authors such as French (2004:2) [2] have defined ICT as "the technology which supports activities involving the creation, storage, manipulation and communication of information, together with their related methods, management and application." It involves the use of different devices like computers, phones, power point, projectors. Information and communication technology (ICT) is looked at as an umbrella term that includes any communication device or application, encompassing: mass media communication where the radio and television is used, phones, computer and network hardware and software, satellite systems and so on, as well as the other services and applications associated with them, such as video-conferencing and distance learning or e-learning.

ICT has rapidly evolved in the recent past and has continued to influence all aspect of human life such that the future generations will not be able to cope with life if the integration of ICT in their curriculum is not addressed now. It is therefore important to note that as technology becomes more and more embedded in our culture, we must provide our learners with relevant and contemporary experiences that allow them to successfully engage with technology and prepare them for life after school. Meaningful education is one that takes care of the individual needs of the learner and be able to achieve this. There must be a realization of deliberate use of Information, communication and technology (ICT) because it provides both students and teachers with more opportunities in adapting to learning processes of an individual needs. He continues to say that, ICT increases access and provision of relevant and quality education. He also adds that it greatly facilitates the acquisition and absorption of knowledge offering developmental opportunities to enhance the education system (Afshari 2009) [1].

In addition, Wadi, (2008) [17], states that Information, communication and technology (ICT) advances the learning process through the provision of more interactive educational materials that increase learner's motivation and facilitate the easy acquisition of basic skills and knowledge. The use of various multi-media devices such as television, videos, and computers motivates learners to work hard. In addition, Koehler, & Mishra, (2008) [7] point out that, there is a common belief that the use of ICTs in education contributes to a more constructivist learning an increase in activity and greater accountability of students. This limits the role of the teacher to supporting, advising, and coaching students rather than merely transmitting knowledge. Information, communication and technology (ICT) in schools provide an opportunity to teachers to transform their practices by providing them with improved educational content and more effective teaching and learning methods.

In Education therefore, ICT has changed the way teachers and pupils relate both inside the classroom as well as outside the classroom. For instance, pupils can now ask questions using a mobile application and teachers can respond to such questions. On another level, teachers, can now use smart boards to demonstrate certain experiments using virtue laboratories. All these developments require a great deal of skills in order to advance the much-needed competence required to move with these developments.

2.1 Teacher computer self-efficacy

According to Hoffmann & Vance (2005) [4] there is a positive relationship between a teacher's computer self-efficacy and computer technology integration in the classroom and that learners' knowledge of computer technology can question teachers' knowledge because they are frequently using it. Therefore, teachers' roles and learners' roles can become interchanged and some teachers may be worried about this situation because teachers like to show their authority concerning computer technology in the classroom. A teachers' knowledge with computers will impact his or her eagerness to integrate technology into the classroom.

2.2 Teacher technological knowledge

Technological Pedagogical Knowledge is viewed as an understanding of how teaching and learning can change when particular technologies are used in particular ways. This includes knowing the pedagogical affordances and constraints of a range of technological tools as they relate to disciplinarily and developmentally appropriate pedagogical designs and strategies. To build Technological Pedagogical Knowledge, a deeper understanding of the constraints and affordances of technologies and the disciplinary contexts within which they function is needed. Technological Pedagogical Knowledge becomes particularly important because most popular software programs are not designed for educational purposes. Software programs such as the Microsoft Office Suite (Word, PowerPoint, Excel, Entourage, and MSN Messenger) are usually designed for business environments. Web-based technologies such as blogs or podcasts are designed for purposes of entertainment, communication, and social networking (Koehler, & Mishra, 2008) [7].

2.3 Effects of computer and ICT in schools

Several studies confirm the positive effects that ICT have on teaching and learning in schools. ICT benefits schools in several ways: enhancing learning in classroom, improves management of school for example, it helps in timetabling, record storage, secretarial work like, typing staff meeting minutes, examinations and letters, improves accountability, efficiency and effectiveness in school activities and use of PowerPoint presentations and internet (ibid).

Khan (2012) [6] described how using internet in school for street children in Colombia enticed a higher than usual number back to classroom. ICT, if fully utilized can reduce

the cost of education and increase efficiency. According to Khan (2012) [6] ICT in school can be viewed as a cost effective especially in terms of manpower as one teacher can reach many learners through internet, interactive white board and video conference technologies. Parents are also spared the agony of buying many textbooks because many of them would be available online. Study and teaching materials are very sparse in many schools in developing countries.

2.4 The benefits and uses of computer and ICT in education

Khan (2012) [6] there is a common belief that the use of ICTs in education contributes to a more constructivist learning and an increase in activity and greater responsibility of pupils. This limits the role of the teacher to support, advise and coaching students rather than merely transmitting knowledge.

The gradual progress in using computers changes from learning about computers to learning computers, and finally to learning with computers.

2.5 Resource co-operative society

The International Institute for Communication and Development (IICD) supports the Resource Co-operative Society in Ndola, which uses computers to conduct small-scale training for students and members of the community in lifelong skills to improve their employability. As such, Zambia like any other country in the world especially in the Southern African Development Community (SADC) region has embraced the use of ICTs in the development of its economy. We are living in a constantly evolving digital world, and information technology (IT) is heavily impacting on nearly every aspect of our lives such as work, socializing, learning and playing to name a few. The digital age has transformed the way people especially young ones communicate, network, seek help, access information and learn.

The first ever Information and Communications Technology (ICT) syllabus for Zambia offers a wide perspective of the subject. It is not restricted to computers but rather usage and application of a variety of technologies and its impact on society. The nature of the ICT subject is such that it will best be learnt within the context of application. As such, activities, projects and problems that replicate real life should form an integral part of the teaching and learning methodologies.

The Upper Basic School ICT is meant to prepare learners for the world of work, further education within the discipline and simply lifelong learning. Since ICT is extremely dynamic and also significantly always impacting on the way we live, learners should be encouraged to grapple with its complexities if they are to become competitive citizens in today's globalized world.

The assessment framework in this syllabus should utilize various types of continuous assessment strategies. This is meant to determine learners' competences in the ICT outcomes presented here. It is desired that the teacher as much as possible utilize assessment strategies that promote active learning by the learner. The case in point include portfolios, observation sheets (to gauge certain competences), written assignments and reports, presentations, projects and experiments.

The Zambian government does recognise that Human and intellectual capital is the most important resource of the country in the quest for sustainable social and economic development. It is also recognised that the development of critical human resource is key to facilitating and accelerating the development of an information society; therefore, ICT has a major role to play in enhancing information in the country.

Further, the Zambian education curriculum framework of 2013 has been developed to include the teaching of Information, communication and technology (ICT) in schools. Besides using it for pleasure and entertainment, Information, communication and technology (ICT) is used for study and work purposes. It also encourages learning; it motivates the individual and at the same time gives him or her capability to do certain activities which are not restricted to time and space. Besides that, its presence betters the learning environment and enriches the learning experience.

Phiri and Silumbe, (2015) [10] notes that the Ministry of General Education has been initiating ICT activities in education which are mainly centered on developing curriculum materials, e-learning, classroom teaching and learning, delivery of education through education radio and television, and development of teacher capacities. All these are focused on ICT integration in education in order to improve quality and access to education though measures have been undertaken by the government and stakeholders, the approach has been rushed thus creating a lot of challenges resulting in the ineffectiveness in the whole process.

There are however barriers in the process of integrating ICT in education system Tapan (2009) [16], observes that teacher's lack of knowledge and skills is one of the main hindrances in the use of Information, communication and technology (ICT) in education." The serious challenge in the usage of ICTs in our school system is the shortage of and inability to retain ICT-skilled labour. This means we have very few trained teachers in employment. Having a well knowledgeable and skilled human resource is cardinal to the development and success of any organization. However, this has been a challenge in terms of ICT in Zambian schools.

Phiri and Silumbe, (2015) [10] indicate that a study of 22 schools surveyed showed that 90% of the teachers that teach ICT have not been taught how to teach the subject. The teachers were hired to teach the subjects in their areas of expertise and are expected to teach it as well. Therefore, lack of knowledge regarding the use of Information, communication and technology (ICT) and a lack of skill on the tools and software have also limited the use of Information, communication and technology (ICT) tools in teaching and learning.

2.6 Implementation of ICT and computer studies in Zambia

ICT has been introduced as a subject. The subject has been introduced in order to equip learners with essential skills necessary for them to have basic knowledge of ICTs at junior Secondary school level.

Computer Studies has been introduced as a new learning area at senior secondary school level as it will stimulate creative and analytical skills in ICT and entrepreneurship so that it is competitive at global level.

2.7 ICT and computer initiatives and projects in Zambia

The Computers for Zambian Schools is a registered trust established by the local educational and ICT specialists, representatives from the British Council, Ministry of Education, and the Beit Trust. It operates as a partnership between the Computers for African Schools, which is a UK-based registered charity, the British Council, HSBC, the British High Commission, the Beit Trust, School Net Zambia, MTN, Zam Net and the Zambian Ministry of Education. The British Council has reportedly facilitated the import of duty-free equipment to Zambia. The Beit Trust provided grants to the project and MTN supported the operating costs for the technical centre. To date the project has reportedly sent 4,500 computers that reached 300 schools in Zambia. It is based at Matero boys' high school in Lusaka where it takes in PCs and refurbishes and redistributes them to schools to be used to support the study of computer studies. The main activities in which Computers for Zambian Schools are involved include training of ICT teachers, distribution of ICTs to schools, provision of technical support to schools, and recycling computers in partnership with a South African company (http://www.cfzs.org.zm)

2.8 School Net Zambia

School Net Zambia was initially established as a short-term pilot project supported by the DRC in the late 1990s. When this project came to an end, the organisation paused for a while and was then re-started with the support of School Net Africa and its partnership with Multichoice Africa and the Open Society Initiative for Southern Africa (OSISA). With the support of Multichoice Africa and Multichoice Zambia, SchoolNet Zambia was able to promote access to satellite television and video in a few schools in order for learners and teachers to access education channels such as Mindset Learn, Discovery Channel, and National Geographic. With the support of OSISA and in partnership with Computer for Zambian Schools, it extended the PC refurbishment centre (http://www.schoolnet.org.zm).

In conclusion, there are numerous benefits attached to Information Communication and Technology (ICT) being included in the Zambian education curriculum. The benefits range from individual to national. The education system can improve on the quality of education to be provided to its citizens. Once the quality of education has improved, it trickles down to national development since education is a key aspect to national development. However, effective implementation of ICT requires positive participation from all stakeholders. Government should provide financial, infrastructure, material, and knowledge and skills through training of the staff meant to teach the subject but this can be made possible through research and innovative approaches by all stake holders.

3. Research design

The study employed a case study research design for data collection and analysis.

3.1 Study area

Study area constituted Secondary Schools in Kasama District, Northern Province.

3.2 Study population

The study population constituted Secondary school teachers, School Managers and pupils from Kasama district. In total

150 respondents were to be targeted.

3.3 Sample size
The sample size for the study constituted 88 respondents.

3.4 Sampling technique
In this study, purposive sampling techniques was used to select schools as strata and stratified sampling technique was used to select respondents.

3.5 Sampling Frame
The sampling frame constituted 60 ICT learners, ICT 20 Teachers, 8 School Managers.

3.6 Method of collecting data
The study employed both quantitative and qualitative methods of data collection.
Questionnaires were used to collect quantitative data while observation checklist and interview schedules generated qualitative data.

3.7 Data collection instruments
The following were used in the study as data collection tools:
3.7.1 Questionnaire for Teachers, Head teacher and Ministry of Education Officials
3.7.2 Laboratory Observation Checklist
3.7.3 Interview schedule

3.8 Data collection procedure
Questionnaires were distributed to respondents in secondary schools that were targeted to represent the district. During the visit, a check on the status of computer laboratories was conducted using observations check lists.

3.9 Ethical consideration
- Permission from the District Education Board Secretary to conduct the research in secondary schools was obtained before conducting research in the targeted schools.
- Consent of the participants and respondents was secured before collecting any information from them.
- Respondents were assured of high level of confidentiality and were also assured that the information they supplied was only to be used for the intended purpose and not for any other purse as was contained in the consent form.

3.10 Data Analysis and Presenting
- Quantitative data from 88 respondents was analyzed using the excel spreadsheet and presented using tables and pie charts with descriptions which expressed percentages of the responses.
- The qualitative data was analyzed in a description manner.
- The researcher also analyzed the data by comparing with the existing literature.

4. Presentation of the findings
The main objective of the study was to establish how teachers and pupils in secondary schools in Kasama District were affected by emerging factors in the teaching and learning of ICTs in secondary schools in Kasama district in Northern Province of Zambia.

4.1 Gender of teachers' respondents

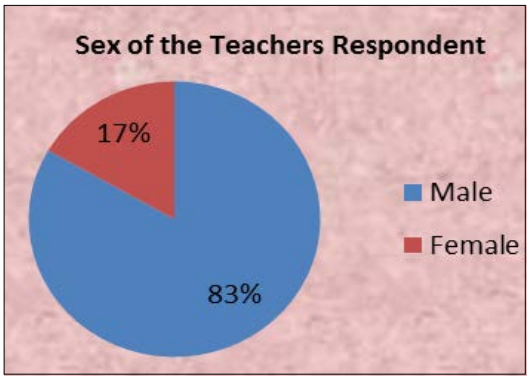


Fig 2: Source: Field Data, 2018

Figure 2 shows that (83 %) respondents were male and female respondents were (17%).

4.2 Trained in computer

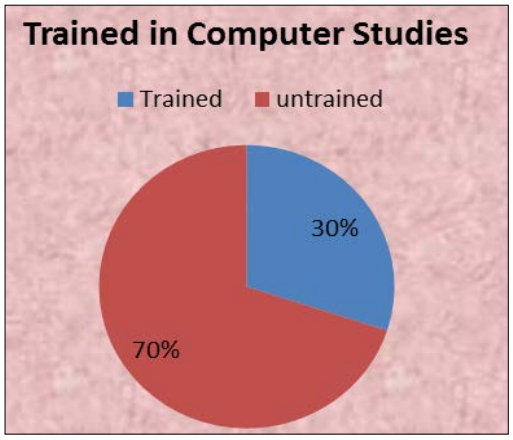


Fig 3

The results presented in Figure 3 shows that 30% of the respondents were trained in ICT while 70%. Of the respondents were not trained but offered to teach the computer as second or third teaching subject

4.3 Teaching experience

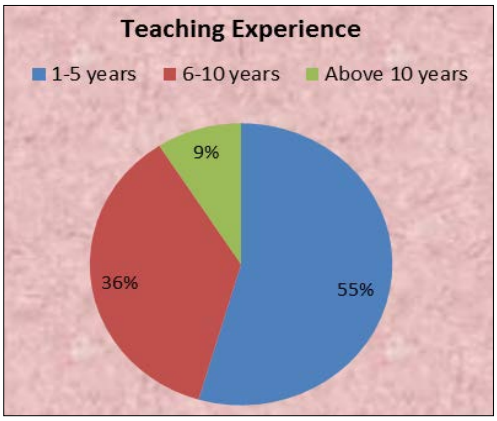


Fig 4

The results in figure 4 show that 84% of teacher respondent have the teaching experience from 1-5 years while 16% have between 6 and 10 years teaching experience.

4.4 Skills and competence in teaching ICT

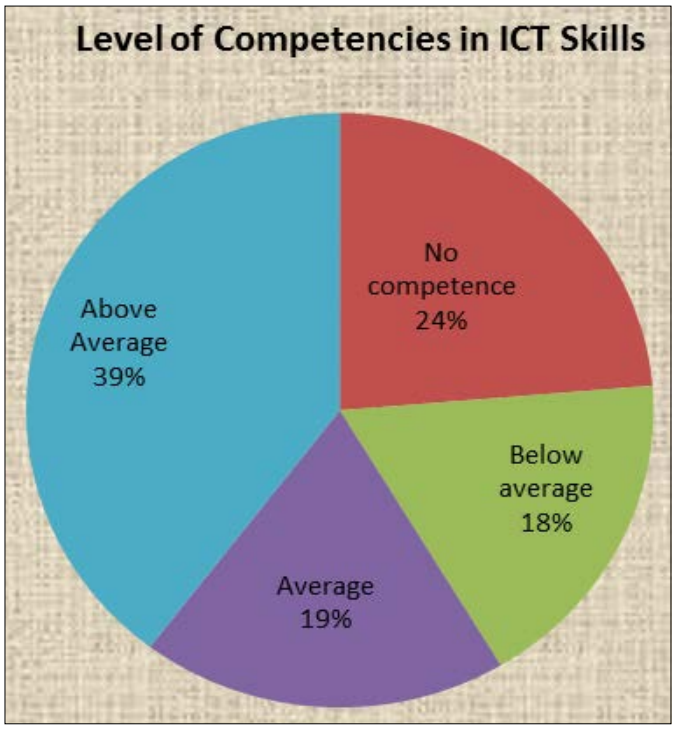


Fig 5

The research results from table 4.1 and figure 5 indicate that 39% of teacher respondent is advanced in skills like; typing, e-mailing, Texting, picture editing, Scanning, voice conferencing and many other skills in computer, 19% are average, 18% are beginners and 24% are unfamiliar.

4.5 Familiarity of the computer programmes

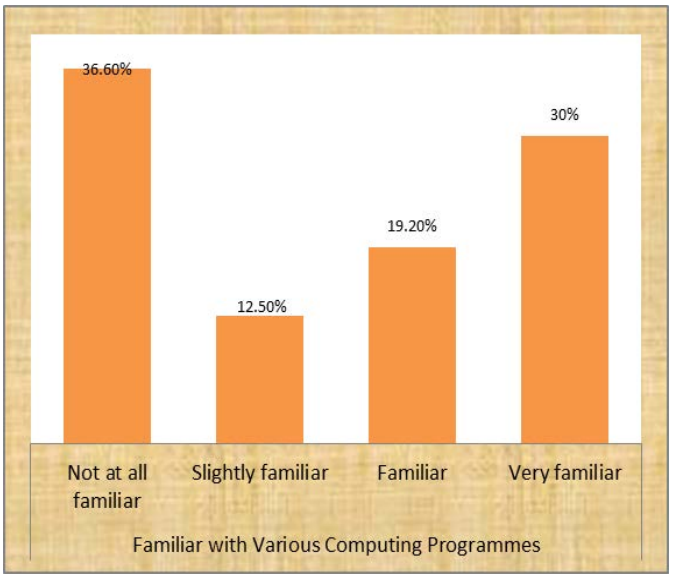


Fig 6

Fig 6 observe that 30% are very familiar with the computer programmes, 19.2% respondents are familiar with computer programmes, 12.5% respondents are slightly familiar and 36.6% were not at all familiar with computer programmes.

4.6 Responses on schools allowing pupils to own ICT Gadgets in Schools Researcher (2017)

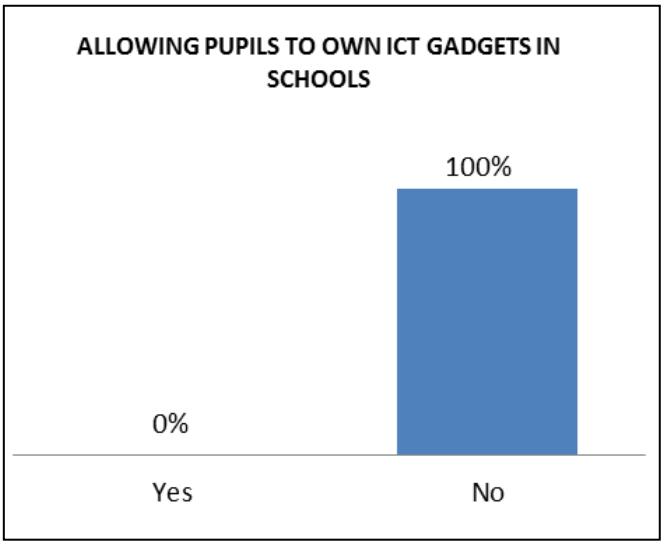


Fig 7

Fig. 7 shows that 100% of respondents indicated that schools do not allow them to own these gadgets.

4.7 Teachers' views on pupils to owning and using personal ICT Gadgets in Schools

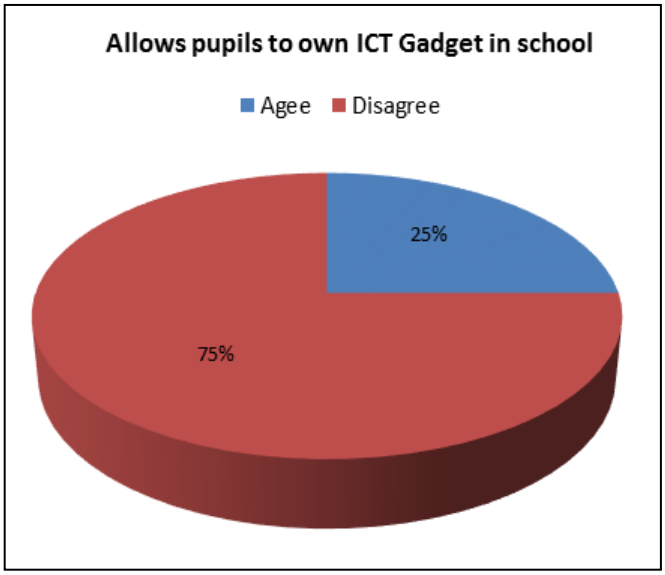


Fig 8

Fig 8 reflects results on the teachers' personal views on the concept of allowing pupils to own and use ICT gadgets in school. 25% of the respondents agreed with the idea and 75% of the respondents disagreed allowing pupils owning the ICT gadgets in schools.

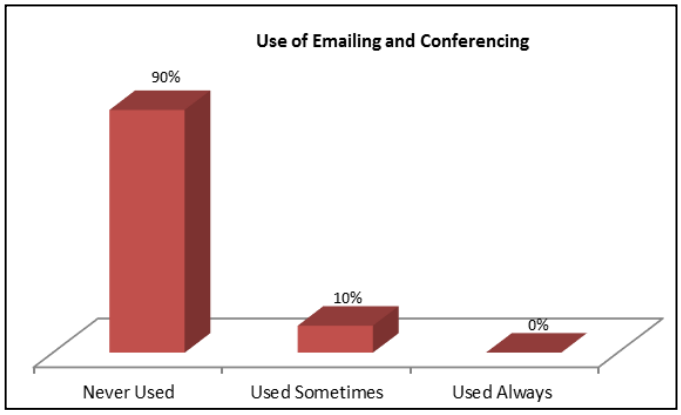


Fig 9

Fig 9 presents respondents results on the use of e-mailing an conferencing methodology. 90% of the respondents indicated that they had never used the methodology and 10% indicated that they had used the methodology.

4.8 Identified challenges in teaching ICT in secondary school

When asked for some of the challenges teachers' face when teaching ICT in schools, the respondents gave the responses as tabulated in 85% indicated that they face the challenge of inadequate computers to teach pupils while 80% of respondents indicated that their schools have no stable internet connectivity. 45% of respondents indicated that the do get required support from their administration while 60% of the respondents indicated that they do not offer practical lessons as the number of pupils outweigh the facilities available. 30% of the respondents showed that they are unable to teach effectively using more flexible methodologies like learner guided learning approach since the pupils are not allowed to own ICT gadgets in schools.

4.9 Responses on the availability of ICT support systems in school

Other emerging factors that were asked to respondents that support the effective teaching of ICT in schools include, the availability of school ICT policies, parental involvement in support the teaching processes as well as the ability of the school to install and distribute the internet network across the school compass. On the school ICT policy 75% of respondents indicated that the policy is not available while 25% indicated that the school ICT policy is available in their schools.

100% of respondents indicated that parents do not get involved in the support of teaching of ICT in schools. Concerning the distribution of internet across the school compass, 85% of respondents indicated that they do not have internet distributed across the school compass while 15% indicated that they have internet distributed in the school compass.

4.10 Responses on the rating of school ICT labs

The following were responses from teachers' on the quality of ICT Labs in their schools. 10% of respondents rated the Labs above average while 40% of teachers rated the labs as being average in quality and 50% of the respondents rated that labs as below average

4.11 Responses from school managers having some form of ICT training background

Finding show that 90% of administrators' respondents do not have any form of ICT background on 10%

When asked for the reasons as to why the school administrators were not will to support the idea of allowing pupils to own and use that ICT gadgets in school, 100% of the respondents indicated that there is misuse of the gadgets by pupils spending most of the time playing with the gadgets as opposed to studying, it posse challenges in maintaining discipline in school and that the girl child uses the gadgets as a tool to communicate with men (lovers).

4.12 Response on the schools having a web site and online learning platforms Moodle or Joomla

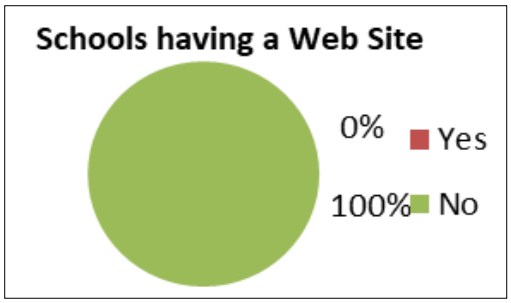


Fig 10

Fig 10 shows that 100% of respondents indicated that they do not have website nor do they have any form of an online learning platforms.

4.13 Pupils responses on ICT facilities in schools

The study sought to assess the computer facilities in secondary schools by asking pupil respondents to rate as a triangulation.

Pupils rating the quality of ICT Labs in school

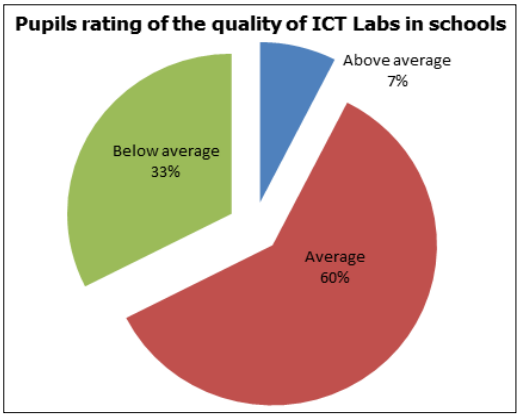


Fig 11 *Sources*: researcher, (2017)

Fig 11 shows finding on the pupils' rating of the quality of ICT labs. The findings were that 7% rated above average, 60% rated average and 33% rated below average.

4.14 Table Accessibility and use of computers by pupils

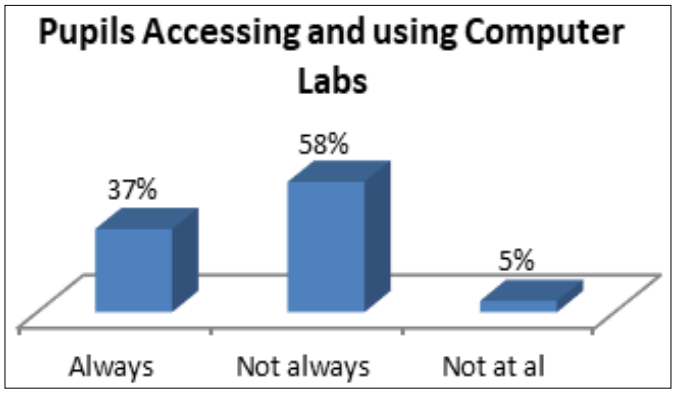


Fig 12

Fig 12 shows the results about pupil respondents' access to the computer labs. 37% of learners did indicate that they always sue the computer labs while 58% of learners indicated that they do not always use the computer labs and only 5% of respondents indicated that they never use the computer labs.

4.15 Pupils' Response on measures to be taken to reduce mitigate on some of the factor that negatively the teaching of ICT

100% of the respondents indicated that schools must provide adequate computers in school flowed by 88% of respondents who indicated that schools should allow pupils to own and use the ICT gadgets in school. 60% of the respondents suggested that teachers should use practical lessons to teach ICT lesson more than theory lessons and 33% of the respondents indicated that there is need to build standard ICT labs and provide internet in school.

5. Data analysis and research discussion

5.1 Gender involvement in the teaching and learning of ICT

The researching was aimed at finding out what emerging factors in the teaching of ICT in secondary schools in Kasama district are affecting the effective teaching of the subject. Finding show that female participation in the teaching of ICT in secondary schools in Kasama district are very low and this is in agreement with report from the UNDP (2011) which indicate that girl child education is still a challenge in Zambia and this may impact negatively on the girl child education in ICT due to lack of role models.

5.2 Qualifications

The results presented in fig 3 indicate that 70% of teachers who teach computer studies in secondary schools were not qualified in computer studies. The results from this study are also in agreement with what Phiri and Silumbe, (2015) [10] discovered. They indicate that a study of 22 schools surveyed showed that 90% of the teachers that teach ICT have not been taught how to teach the subject. The teachers were hired to teach the subjects in their areas of expertise and are expected to teach it as well. Therefore, lack of knowledge regarding the use of Information, communication and technology (ICT) and a lack of skill on the tools and software have also limited the use of Information, communication and technology (ICT) tools in teaching and learning. Tapan (2009) [16] states that if there is lack of appropriate staff training and quality training for teachers, the results will be very poor.

5.3 Allowing pupils own and use ICT related gadgets in teaching and learning

Effective teaching and learning of requires that learners interact with ICT tools which are brilliant aid in teaching and learning. Education is no longer limited to classrooms. It has reached far and wide, thanks to computers. Physically distant locations have come closer due to Internet accessibility. So, even if students and teachers are not in the same premises, they can very well communicate with one another. Hawkins (2010) [12] indicates that with the emergence of increasingly robust connectivity infrastructure and cheaper computer, school systems around the world are developing the ability to provide learning opportunities to students "anytime anywhere".

Reviewed studies clearly show that a paradigm shift in the way teaching of ICT is done in not an option but in Zambian schools this shift is easier said than done ultimately the success or failure of technology projects in the classroom hinge on the human factor and willingness of a teacher to step into unchartered territory. One of the most effective ways to achieve this is by making ICT gadgets more available, accessed and used by learners in schools but findings on this matter as presented in figures 4.7,8,29 and 47 show the opposite. Schools are not ready to embrace the concept of empowering leaners with gadgets for them to access learning anywhere and at any time and yet these are the most recommended contemporary methods in teaching of ICT and any subject.

5.4 Reasons for not allowing learners to own and use ICT gadgets in schools

It is regrettable to note that reasons given in this study for not allowing pupils to use ICT related gadgets in school are not progressive at all. Such reasons are more human attitude than technical and logistical factors to continue negatively affecting the teaching of ICT.

5.5 Familiarity in computer programmes

The other emerging factor found to be negatively affecting the teaching and learning of ICT in secondary schools was the lack of adequate experience by teachers in ICT software programmes. Findings show that results, 30% of teachers were very familiar with the computer programmes, 19.2% respondents are familiar with computer programmes, 12.5% respondents are slightly familiar and 36.6% were not at all familiar with computer programmes. The implication of this not meaningful transfer of knowledge by teacher to learners will occur hence the need to expose teacher for more ICT CPD as indicated by Richard (1994) [11] who notes that there is a positive relationship between a teacher's computer self-efficacy and computer technology integration in the classroom and that learners' knowledge of computer technology can question teachers' knowledge because they are frequently using it.

According to literature review, Education Curriculum

Framework, (2012) Learning institutions should ensure that they put in place the right numbers with correct academic and professional qualifications for teaching and non-teaching staff. This will help in the effective implementation of the curriculum at different levels.

The results are presented in Figure 4.2 according to the data findings; 6 teachers were fully trained in ICT translating 30% while 14 teachers were not trained but offered to teach the computer as second or third teaching subject translating to 70%. Hence, the impact towards the quality education on learners is lower than expectation in the teaching and learning of computer studies in secondary schools.

The study indicates that ICT teaching and learning in different places have been influenced and affected by the availability of trained teachers, their qualification and even their attitude towards teaching this subject. However, the 30% of teachers who are trained in either Bachelor of computer Studies, on the other hand, feel that they do not teach effectively because of other teacher-related factors.

Furthermore, the study showed that teachers' attitude and morale was not positive due to different challenge they were encountering in teaching the computer studies subject. In all the four schools the respondents seemed to feel that they were not appreciated since this subject like other science subjects like mathematics and physics is difficult and does not have a lot of teachers available to teach this subject.

5.6 Methods of teaching

Methods are a vehicle in delivering lessons. The methods seem to be working well as they yield good results. Effective methods help pupils understand concepts in any subject area. The study intended to find out if a number of recommended methods and strategies were being used by teachers in the teaching of ICT subject in schools. According Hawkins (2010) [12] argues that new advances in hardware and software are making mobile "smart phone" indispensable tools. Just as cell phones have leapfrogged fixed line technology in the telecommunications industry, it is likely that mobile devices with internet access and computing capabilities will soon overtake personal computers as the information appliance of choice in the classroom.

According to the findings of the study teachers that teach computer studies do not implore effective ICT pedagogies in teaching and this is attributed to lack of training by those found teaching ICT.

5.7 Availability of computer laboratory and computer facilities

The successful implementation of teaching and learning of ICT in secondary schools depends much on the well-established infrastructure and devices like a laboratory, computers, textbooks and other materials, reliable power supply and the ratio one computer to the number of pupils just like what Kellenberger & Hendricks (2000) [5] ague. They indicate that access to reliable and functional computer resources is a key factor in use of computers for instructional activities. It worth noting here that laboratories in schools were however mostly rated to be below average in public schools with exceptions from mission school and the secondary schools that had support from ZICTA. ZICTA had donated computers and furnished the labs with client server machines to support the implementation of introduction of ICT in schools (Sichone, 2011) [15].

6. Summary, conclusion and recommendations

6.1 Summary of the study

In conclusion, the researcher sort to investigate the effective teaching of ICT in secondary schools in Kasama district following the recent introduction and popularization of the subject backed by the ICT national policy. The Ministry of General education is implementing this policy through offering the subject to school pupils. The manner in which the subject was introduced called for investigation of how the implementation was being done by establishing which factors are positively and negatively affecting the teaching and learning of the subject, hence this study.

Facts presented in this study review that there are technical and human factors that are affecting mostly negatively on the effective teaching and learning of ICT in secondary schools in Kasama district namely these being:

Rigidity of school managers to embrace contemporary approaches in the teaching if the subject to learners such as not being flexible in allowing pupils to own and use the ICT gadgets in school which could allow teachers to teach learners in a more pupil personalized and adaptive way.

Inability for the schools to procure and distribute internet facility across the school compass for pupils to research off this could only be possible if the pupils were allowed to own and use the ICT gadgets in school but this was not the case.

It was also reviewed that a number of teachers assigned to teach ICT in schools were not ICT specific trained and could not effectively address the challenges in the detaching of the subject adequately.

The other notable factor reviewed was the inability of the teachers to adopt the most effective ways of teaching the subject such as field trips, guest speakers, and use of e-learning systems which was off confounded by the problem of learners not having gadgets to support this strategy. However, this was more of the attitude than the technical deficit on the part of teachers.

On the other hand it was found that administrators were more willing to support teachers in the area of CPD activities in order to equip teachers with more relevant knowledge and skills in the teaching of the subject.

The study is hereby concluded by stating that despite all the challenges poised in the teaching of ICT in secondary schools, there are is a good will and best efforts schools are making to effectively implement the ICT curriculum if only the noted challenges or emergent factors are looked into and addresses by the relevant authorities.

6.2 Recommendations

Based on the results and findings of the research study, the following recommendations are hereby made:

- School managers and indeed all stakeholders in education including parents, must consider the aspect of allowing pupils to own and use ICT gadgets in schools and come up with mechanisms to control abuse of the gadgets than complete deny leaners opportunity to benefit from the facilities in their learning process.

- Basic equipment and infrastructure such as computers and other information and communication technology (ICT) facilities should be put in place in schools to facilitate the acquisition of basic computer skills among teachers and students in secondary schools. This assertion agrees with who purposed equipping of computer classrooms for improved effective understanding and achievement of learning goals.
- Teachers should be encouraged and supported to scale up their knowledge and skills in the contemporary pedagogies for the teaching and learning of ICT in secondary schools.
- ICT CPD activities must be held in schools and
- Teachers should be encouraged to utilize computers in their teaching and learning process because goes a long way to enhance the process and enable teachers to perform their duties effectively, and efficiently.
- There is need for colleges of education to offer ICT courses as compulsory to trainee teachers so that when they graduate they will be able to teach the subject at any level.
- The study review that there is a tendency by teachers and learners to abuse and misuse the ICT facilities particularly the internet in school. To this effect schools must come up with ICT policies to properly regulate the use of ICT facilities by bot teachers and pupils.
- Computer education should be made compulsory at all levels of secondary schools. Also Computer Studies should be made a core subject in the senior secondary examinations organized by examination bodies such Examination council of Zambia. This will encourage students to endeavour to increase their knowledge on computer education and improve on their quality of education

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