Interventions by Secondary School Heads in Effective Implementation of Information and Communication Technology in Mutasa District of Manicaland in Zimbabwe

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ABSTRACT

This study was designed to investigate interventions that were being introduced by secondary school heads in effective implementation of Information and Communication Technology (ICT) in Mutasa District of Manicaland in Zimbabwe. The study population comprised forty-two secondary schools with a combined enrolment of around ten thousand two hundred students and thirty secondary school heads. Purposive sampling was used to select ten secondary schools and thirty-seven teachers for detailed study. An entirely qualitative research design was used since the researchers were dealing with unstructured and non-numeric data. The researchers used questionnaires, interviews, observation and document analysis to elicit data that were needed to provide responses to research questions. The major findings were that although school heads had generally embraced ICT at their schools, they did not have proper ICT qualifications and were not fully equipped to deal with all issues that would lead to meaningful interventions. School heads did not have adequate knowledge on ICT and very little was being done to address the situation through in-service programmes. It was also noted that school heads faced a multiplicity of problems which heavily militated against the smooth introduction of ICT in schools. Most of the problems emanated from the fact that these schools did not have solid revenue bases. It was also observed that the attitude of the head was a pivotal factor that determined the manner and extent of ICT usage at a school. The mind-set of the head was seen as being very instrumental in encouraging teachers to embrace or ignore ICT. This research also revealed that there were other external forces that compelled school heads to introduce ICT at their schools. This study strongly recommends that responsible authorities for schools and the Ministry of Primary and Secondary Education in Zimbabwe should come up with serious measures that assist school heads to procure ICT appliances and learn about them.

1. Introduction

The role of technology in teaching and learning is rapidly becoming one of the most important and widely discussed issues in contemporary education. Most experts in the field of education agree that when properly used Information and Communication Technology (ICT) hold great promise for the future for enhancing teaching and learning (Aduwa-OglegbaenandIyamu,2006).The ongoing unprecedented growth of Information and Communication Technology coupled with globalization of the economy has created a great challenge for education. The implementation of ICT reforms is at the forefront of educational reformsl ocally, regionally, nationally and internationally. United States of America, Spain and Portugal are among the first to draw up master plans for developing ICT in education. (Wong,2008). Unprecedented development of ICT has led to widespread intention of using ICT to advance educational goals and it is rapidly becoming one of the most important and widely discussed issues in contemporary education (Thierer,

2010).Most educational experts agree that ICT holds great promise for improving teaching and learning in addition to workforce opportunities (Polizzi, 2011). There is no doubt that the computer can aid the instructional process and facilitate the process of teaching and learning. Today, nearly everyone in the industrialized world has access to ICT gadgets. In American schools, it has now actually become more difficult to keep track of how many computers are being purchased daily. The story is the same in Britain. Even developing countries have also embraced ICT. In Africa, concerted efforts are also being made by governments to initiate Internet connectivity and provide ICT facilities. In Uganda, a programme called School Net is extending educational technology throughout the country. (Carlson and Firpo, 2011).A programme with similar intentions is also available in Senegal. In an attempt to keep pace with computer education, Nigeria enacted a policy on computer education in 1998. The plan was to establish pilot schools and

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thereafter diffuse innovation firstly to secondary schools and then to primary schools. This programme was, however, affected by prohibitive costs, weak infrastructure, limited access to the Internet and lack of relevant software and a host of other factors. In the rapidly changing world of global market competition, automation, globalization and increasing democratization, the ability to access and utilize ICT is no longer a luxury but a necessity for development. Some developing countries are however still on the wrong side of the digital divide.

Education systems all over the world are changing because of new technology that is now permeating our societies. Computers have revolutionized the way people operate in education. A lot of institutions are embracing Information and Communication Technology. In Zimbabwe ,ICT is being introduced in a variety of ways. Non-Governmental Organizations, School Development Committees' and the business community are all playing a big role in ensuring that schools get information and communication gadgets. The role being played by the state should also not be downplayed. The advent of the Internet has seen a lot of teachers using that medium to access unlimited tonnes of information. Around the world scholars have noted that the integration of information and communication technologies have become a key issue in education since the early 1990s. Since the challenge of technology is more cultural than technological, countries have a responsibility not merely to provide computers for schools but also to foster a culture of acceptance among the end users of these tools (Albrini, 2006).Developed countries have always attached great importance to the application of ICT in education. The UK government spent 2.5 billion pounds in promoting ICT in its schools between 2008 and 2009 (Yilmaz, 2011). It should, however, be pointed out from the beginning that at the present moment we still have a large number of schools that are not taking ICT seriously. Zimbabwe embraced the ICT concept as a nation in 2005. The then-head of state Cde Robert Mugabe was at the centre of the launch of national computerization programme. ICT issues had also been placed on the global agenda by the United Nations through the Millennium Development Goals. The last goal (number 8) of the MDG's encourages countries to ensure that ICT benefits are expanded in such a way that even poor communities have access to them. It cannot be doubted that Zimbabwe is missing out on some I CT benefits. Many schools in the country are still heavily relying on the voice of the teacher and other written aids. Despite the fact that a national ICT policy in line with the Millennium Development Goals was launched in 2005, many schools in Mutasa have not yet developed the capacity to use ICT to its fullest extent. The researcher needs to find out why progress in ICT learning and learning has not been rapid in some schools. Special attention will be paid to the role being played by school heads in ICT implementation. Several studies in ICT implementation by heads have been carried out in the developed world. It would also be interesting to find out whether ICT ideas on heads that have been developed in other countries also work in Zimbabwe. In many institutions desktop computers, laptops and data enabled cellphones are available but at times they are not being fully used for teaching and learning purposes. Suryani(2010) noted that in schools there is a problem of conservatism. This is resulting in a situation whereby some people do not quickly embrace technology. Teachers at times refuse to change familiar practices. They want to continue doing things the way they have always been done.

Some governments like the Australian government have clearly taken up the challenge of transforming schools to meet the needs of the information age(Cobbold,2007). As has already been stated earlier, Zimbabwe adopted a national ICT framework in 2005 and most of its universities and colleges have already designed their ICT programmes. An institution like Africa University has also invested heavily in Information and Communication Technology. Every enrolled student at Africa University has to do a mandatory course called HIT 100- Introduction to Information Technology. This course is designed to provide students with basic knowledge of computers and related applications. After doing this course, students are able to do research on the Internet, use basic computer software like Excel, Word and PowerPoint. Students are also able to access results and register online. The most important thing is that students will be able to learn and teach their peers using ICT resources. It has also been noted that computers can enliven teaching and provide inspiration to students in all areas of learning. Player-Koro (2012) asserted that it does not make sense for schools that can afford modern ICT gadgets to ignore them because a good number of students in developing nations will already be having these in their pockets and at home. Some schools may be reluctant to make extensive use of ICT because they fear that students may spend most of their time chatting and watching programmes of an unethical nature (Youssef and Dahmani,2010).The researchers are very much interested in finding out whether these perceptions are also responsible for hindering implementation of ICT by local school leaders. The main reason for undertaking this study is to find out what school heads are doing to improve ICT access. A lot of schools in Zimbabwe are opening computer laboratories where students learn issues related to ICT but sadly ICT learning is not being extended to other subjects. Students are only bothered by ICT when doing computer lessons.

Leadership is considered as crucial for initiating reform and development in schools (Kruse and Louis, 2009). School leadership acts as a significant driver for improvements in any learning organization. Leadership was seen as a social support system interacting with a web of institutional systems and there is some kind of agreement on the fact that collaborative leadership is one of the best styles that suits ICT infusion into teaching and learning. Regardless of the quality of human resource development initiatives, new instructional purchases or technological resources provided little value unless some collective social capacity emerges for these resources to be used in a meaningful way. Literature on school leadership tends to focus on leader's personal attributes, character traits, roles, functions and actions (Bryk, 2010). Studies on leadership and ICT have also shown that the interactive web of leadership running across institutional levels is a significant premise indicator of the widespread and effective use of ICT in learning. According to Anderson and Dexter (2006), effective leadership in the application of ICT is a significant predictor of ICT use by teachers and students.

A nationwide survey of more than 800 participants was conducted in USA to examine technology leadership characteristics and their effects on indicators of technology outcomes. The research findings confirmed that although technology infrastructure is important, the school leader's orientation towards technology use and leadership are more crucial for the effective utilization of technology in education. Planning and operationalizing effective school wide technology is a mammoth task that requires the involvement of various actors in the school. These actors are found at different levels. Successfully implementing ICT requires

team-based leadership. On the basis of the nationwide survey of 386 teachers in primary and secondary schools, Hatelevik and Arnseth (2012) reported that teachers experiencing ICT supportive school leaders are more likely to experience supportive colleagues and are also likely to believe that computers can be useful in the classroom.

The school head is an instrumental figure in establishing the school climate. The atmosphere in a school can either be positive or negative. Educational leaders are supposed to inspire a shared vision that allows comprehensive integration and fosters an environment and culture conducive to the realization of that vision. ICT fusion into education thrives in an environment where the school head encourages creativity, enthusiasm and a sense of belonging. Collaboration and experimentation should also be allowed in the spirit of progress. Research has also proved that principals can influence conditions that support the quality of interaction among teachers and in doing so the development of trust (Price, 2015). Principals have an essential role in the development of social networks around the school. Staff members can share ideas using these networks to advance the vision and the strategic plans of the school. Leaders who implement technological plans can also inspire their subordinates. Condie and Munro (2007) mentioned that a critical factor in the effective use of ICT is the existence of a strategy that addresses future development and sustainability. It also includes some means of monitoring milestones. Every school leader must put in place a plan for dealing with ICT issues. Many schools now have plan, but evaluation is normally the weakest component of those plans. Evaluation is a must but there are no standardized procedures in evaluation. Leaders need to monitor their needs and problems so as to navigate the ICT roadmap smoothly (Solar, Sabattin and Parada, 2013). ICT implementation depends on the quality and maturity of the plan. Examination of literature about the implementation of ICT into classrooms to find strategies for improving learning opportunities reveals the fact that the focus has been on the teacher (Schiller, 2010). There is limited literature on the connection between ICT and educational leaders. Most of the ICT research concentrates on what goes on in the classroom. Isolated small-scale researchers have demonstrated that ICT is having a huge impact on leaders (Gurr, 2010). A lot of literature, however, points to the fact that the school principal is a leading factor in successfully changing operations at a school (Hall and Hord, 2011). A multiplicity of studies has been carried out to examine factors that affect technology integration in schools. The role of the principal has been proved to be the largest single factor affecting technology integration in schools (Moyle, 2006).

2. Research Questions

There were five research questions generated for the study and they were as indicated below:

1. What are the attitudes of secondary school heads to the implementation of ICT in schools?
2. Do secondary school heads have knowledge in ICT teaching and learning?
3. How can secondary school heads enhance ICT usage in their schools?
4. To what extent is ICT in servicing available to school heads especially those in the rural communities?
5. What are the problems militating against ICT implementation in secondary schools?

3. Methodology
3.1 Research design

According to Oyedele (2011), a research designis a plan, structure and strategy of an investigation conceived so as to obtain answers to research questions. A research design includes what the researcher will do from the hypothesis and their implications to the final analysis of data. Qualitative research design with descriptive survey type was used for the study and it helped the researchers to understand the behaviour of secondary school heads towards the promotion of the ICT implementation. The descriptive survey of research was also used to examine attitude of school heads towards ICT. The researchers also examined practices, trends and relationships that have a bearing on ICT usage. Descriptive statistics were relied on at a later stage to analyse data and for example make conversions like percentages. Descriptive statistics were also used because they are an aspect of qualitative research. Only ten schools were used in the research. The researchers had the belief that the situation that was prevailing in those schools was a true reflection of what was occurring in the whole of Mutasa.

3.2 Population and Sampling

There were forty-two secondary schools in Mutasa district during the period of this research project. Six schools provided boarding facilities, two private schools and thirty-four schools were under the control of Mutasa District Council. These schools had a combined enrolment of around ten thousand two hundred students. Purposive sampling was used in order to come up with a picture that could be generalized to reflect prevailing conditions in Mutasa. It was expected that the schools that were picked facilitated high levels of reliability because fewer units were studied closely. The researchers visited two boarding schools and eight other schools. This kind of sampling reduced expenses but was still able to provide results that could be relied on. The researchers settled for purposive sampling because they had a rough idea of what to expect in boarding and day schools. It was also generally expected that most ICT innovations would be found in boarding as opposed to council schools. Purposive sampling was also used to reduce costs of moving from one school to the other. The researchers targeted schools where a lot of information could be collected.

3.3 Data Collection Instruments

Questionnaire, interviews and observation were used to collect data from the sampled population. The researchers also scrutinized various documents that were given access to.

3.3.1 Questionnaires

A questionnaire is simply a series of questions to be answered by a respondent (Oyedele, 2011). The researchers used questionnaires that had open and closed questions. The questionnaires started with a brief introduction spelling out the purpose. Two sets of questionnaires were used. One was for heads and the other for teachers. The questionnaires for heads had two parts. The first part asked for personal information about the respondent. The second part had four questions eliciting information on ICT. The questionnaire for teachers had nine questions and was also divided into two parts. It included both open and closed questions .Questionnaires were usedas the main source of data because they catered for a multiplicity of aspects on ICT issues. Respondents had to complete them without being influenced by others. These were prepared for teachers and school heads. The questionnaires tried to bring out information on ICT usage and attitudes of heads in various schools. The researchers encouraged respondents to be truthful and return all questionnaires.

3.3.2 Interviews

A research interview can be defined as a two-person conversation initiated by the interviewer for the specific purpose of obtaining information and focus by him on content specified by research objectives of systematic description, prediction or explanation(Kahn and Connell, 2010). An in-depth interview guide was made for selectedschool heads and teachers. The researchers decided to use interviews after noting their potential which was greater than that of questionnaires. The element of human interaction which was associated with interviews allowed probing. Respondents could speak a lot without having to write. It is sad to point out that it was very difficult to bring heads of big schools to the interview table. Another reason for using interviews was that they ensured that respondents provided information without the influence of other people. Non-verbal clues were alsoused to ascertain the validity and reliability of spoken words. The researchers also took note of the need to remain positive. Respondents were told why they were singled out for there search. The researchers also asked selected Mutasa secondary heads to explain what they were doing in the area of ICT interventions. Selected teachers were also asked to provide information through the use of interviews. The respondents were given adequate advance information relating to the time and duration of the interviews. Interviews provided immediate feedback and also allowed the researchers to do probing in order to get clarifications. The researchers were however aware of the fact that false answers could still be provided so as to please the interviewer. The validity of the data could also be reduced by the inability or unwillingness of respondents to give full or accurate information. Interviews were used to clarify issues that arose from questionnaires. The researchers also examined what respondents were saying against what were being observed. When the researchers felt that there was a mismatch between the two they continued to probe.

3.3.3Observation

Oyedele (2011) wrote that the observational method is the primary technique for collecting data on nonverbal behaviour and it allows a person to look at the social situations in relations to their naturally occurring contexts. This technique allowed the researchers to record what was going on and take notes. The researchers got permission to enter laboratories and take note of equipment that fell under the ICT category. Information was observed under natural conditions .Observation also allowed direct contact with staff members and students. First-hand information was easily captured. The researchers were also given permission to observe the teaching of selected lessons using ICT components. The researchers observed lessons at High Schools A, B and C. The researchers were, however, aware of the fact that observation was entirely objective and functional because seeing could be selective. Observation was also advantageous in that it occurred concurrently with interviews and questionnaire administration. Observation confirmed areas of agreement and disagreement. What the researchers at times observed were totally different from what were said during interviews. An observation checklist was made ahead of observations so as to ensure that the process was not done in a haphazard way. The observation checklist mainly concentrated on the following:

•State and general appearance of ICT devices like computers.
•Models of ICT devices.
•Software that was detected on computers.
•Computer laboratories and their fittings.
•Security features for rooms where ICT gadgets were stored.

•Age of computers and related accessories.
•How lessons were being conducted.

3.3.4 Document Analysis

The researchers also made use of documents that were made available by various institutions. Some schools were more than willing to give the researchers access to inventories and asset registers. This assisted the researchers to come up with exact figures of ICT resources that were found in different schools. The district also provided records that allowed the researchers to get various statistics. The researchers were allowed to compile figures using staffing and enrolment returns which had been submitted to the district office by various schools. Records provided by the district for example showed the researchers that during the period of research eleven schools were offering computers as a subject and eighteen out of forty-two schools were still to be electrified. The researchers were also allowed to peruse the School Development Plan document at nine out of ten schools which were visited.

4. Findings

The findings were based on the systematic presentation of the five research questions using data obtained from interviews, questionnaires, observation and document analysis.

4.1 Research Questions

There were five research questions generated for this study and they are presented in a systematic manner as indicated below:

4.1.1 Research Question 1 which states that, "What are the attitudes of secondary school heads to the implementation of ICT?"

Responses from questionnaires administered on teachers and document analysis were used to provide findings to the objective. Question 6 on the questionnaire for teachers asked respondents to state whether their heads supported ICT programmes. The researchers felt that teachers could provide reliable information on the attitudes of their heads because they worked with them on a daily basis. Twenty-one out of thirty-seven teachers confirmed that their heads had a positive attitude towards ICT programmes. Sixteen teachers felt that the attitude of their heads left a lot to be desired. The researchers went further to find out whether attitude towards ICT was affected by age and adoption of ICT programmes. Nineteen out of thirty-seven teachers stated that age mattered in acceptance of ICT interventions. One respondent wrote:

To a greater extent age has proved to be an issue in adoption of ICT solutions. Young people tend to display better skills and passion for ICT issues while older people are let down by conservatism. Incompetence has resulted in the development of negativity to ICT programmes.

Another respondent asserted:

Age is an issue because those who did their education long back got their qualifications with out ICT devices. They became used to pen and paper.

Some respondents argued that age did not matter. One teacher said:

Age is an issue but it has to do with one's attitude. The mind-set of the head is more important than any thing else.

The researchers were also able to gauge the heads' attitude through interviews. Seven out of ten school heads had positive words when they were asked to talk about ICT devices. The researchers also noted that teachers at the schools for these seven heads had some kind of budget for ICT interventions. Heads whose attitudes towards ICT were deemed to be negative were also observed to be not doing much.

The researchers observed that although the attitudes of certain heads were negative, certain external factors forced them to buy ICT gadgets. A case in point is the process of ZIMSEC registration for 'O' and 'A' level candidates. It is now compulsory for all centres to do e-registration for their candidates. Interviews with school heads also revealed that some materials were now being made available to heads in soft copies for example at a curriculum workshop for Mutasa heads held at Old Mutare at the end of September 2016, most of the documents were in Power Point form. At this workshop the use of projectors was emphasized to enable schools to cascade information that had been disseminated to teachers.

The researchers were also able to work out attitudes of heads to ICT programmes by carefully examining School Development Plans. The researchers were given access to SDPs at nine secondary schools. Eight high schools expressed their willingness to purchase computers in the next five years. One high school completely overlooked ICT programmes and the researchers blamed the head for such a development.

The researchers also noted a link between positive attitudes and adoption of ICT interventions in three schools. Where heads had a negative attitude towards ICT, there were insignificant ICT interventions other than those which were mandatory. At the high school mentioned in the previous paragraph there were no provisions for ICT interventions because the head's attitude to ICT devices left a lot to be desired.

4.1.2 Research question 2which states that, "Do secondary school heads have knowledge about ICT teaching and learning?"

Responses from questionnaires were used to provide findings to the objective. The researchers also used observation to find what the heads were doing. Question five on the questionnaires for heads required them to state whether they had ICT-related qualifications. Question six on the questionnaire for teachers also asked for comments on the extent to which the ICT knowledge for heads was a factor in ICT interventions. At High school D, six teachers agreed that their head was very knowledgeable, and this had greatly contributed to the development of state of art ICT facilities at the institution. One teacher wrote:

To a great extent his knowledge is helpful as he is trying to supply us with advanced tools to use.

The head at that school possessed excellent ICT knowledge and was encouraging teachers to make use of ICT devices. Another respondent at High School D made this comment +8 the ICT knowledge of the head:

A great contributory factor because he is quite conversant with most of the issues to do with ICT. He had a lot of input in the installation of Wi-Fi at the school.

Teachers at High School B also concurred that their head had adequate ICT knowledge and was an instrumental figure in ICT interventions. One teacher made the following comment:

He has the knowledge and has a functional computer connected to the Internet in his office.

This was supported by another teacher who wrote:

The head is very supportive in using ICT since he keeps urging teachers to use ICT in lesson delivery. The head himself uses a projector in his lessons or whenever he is having meetings.

Mixed responses about the school head's knowledge were given at High School C. Three teachers felt that their head had adequate ICT knowledge while three respondents felt that their head needed to acquire 'more knowledge for him to become a useful ICT player at the institution.

Six teachers who were given questionnaires at High School E did not have positive words for their head. All of them concurred that their school head was a stumbling block to ICT programmes. One respondent asserted:

The head's ICT knowledge is weak and this has greatly affected the institution as noted by little investment in the area of ICT.

This was backed by another teacher who said:

To a large extent the head's ICT knowledge is hindering the use of ICT at the school.

A third teacher wrote that the head did not have any computer literacy, and this alone had negatively affected the possibility of introducing meaningful ICT interventions. Observations made by the researcher confirmed what the teachers were saying. The school had electrical power, but the head's office did not even have a single machine that belonged to the category of educational ICT devices. The head appeared uninterested.

Question 7 on the Interview Guide for heads also collected information on workshops that heads had attended in the last two years. Five out of ten heads confirmed attending an ICT workshop of some sort.

4.1.3 Research Question 3 which states "How can secondary school heads enhance ICT usage in their schools?" Responses from questionnaires and interviews were used to provide findings to this objective. Ten out of thirty-seven teachers mentioned that school heads were supposed to acquire more ICT knowledge by attending ICT courses. One respondent asserted:

The school head should attend programmes on ICT to gain knowledge on this and also to delegate to teachers who had knowledge of ICT.

The researchers also used teachers to find out what heads needed to do to improve the usage of ICT in schools. The researchers also asked heads to say what they thought was necessary in order to enhance ICT usage. The following ideas were raised by heads and teachers as responses to questionnaires and during interview.

4.1.3.1 Broaden Internet use.

Four out of ten schools already had Wi-Fi installations in place. Sadly, in the four schools, all teachers who were interviewed and stated that their Wi-Fi range was limited because of poor bandwidth. This resulted in excessive congestion which rendered the system useless especially during prime time. In the four schools mentioned above, it was also observed that teachers and students only had access to the Internet during specific periods. Teachers also pointed out that school heads were supposed to subscribe to data plans that were sufficient for the schools.

Figure 1. Students making use of Wi-Fi during lunch at High School.

4.1.3.2 Electrify schools.

Information obtained from the district revealed that many schools were still to be circuited for electricity supply. Eighteen schools were still to be connected to the national power grid. The researchers also noted that only one high school out of ten which were visited had electricity in all the learning rooms. Some schools that had electricity from ZESA only had power in the administration block and a few other specialized structures like laboratories and workshops. This implied that teachers could not use ICT machines in most of the classrooms.

4.1.3.3 Buy more equipment and machines.

The ratio of computers per student was seen to be very high. High school C for example relied on 30 computers which served 410 pupils. High school B, with over one thousand students, possessed only functional 32 computers. The situation was better at High school D where around four hundred pupils used 105 computers. Three schools owned projectors. In nine schools that were visited, teachers were of the opinion that their heads were supposed to purchase more computers and ICT devices. If more devices were purchased, it would be easy to introduce more ICT interventions.

4.1.3.4 Build more laboratories.

Although many schools were observed to be making commendable progress in the provision of ICT facilities, only one high school had managed to erect state of art computer laboratories. Those facilities were seen at High School D. An example of such facilities is a computer laboratory designated for junior students at the school as depicted in Figure 2 (interior) and Figure 3 (exterior).

Figure 2. Internal View of Junior Computer Laboratory at High School D.

Figure 3. External View of Senior Computer Laboratory at High School D.

High School C was observed to have made commendable progress because a real computer laboratory had been built and was nearing completion as illustrated in Figure 4. The new computer block at High School C was expected to be commissioned soon. At the time of the visit the school was busy putting some final interior touches. Advanced Level students will now have their own computer laboratory.

Figure 4. Computer laboratory block nearing completion at High School C.

4.1.3.5 Increase the use of delegation.

It was clear that heads were lacking in ICT qualifications. Only three out of ten heads confirmed having qualifications in ICT. These three heads, however, had only done basic courses in ICT and were far from being experts in that area. Heads were therefore encouraged to delegate to others who were knowledgeable especially teachers. High School A was seemed to be enriched because it had two teachers who had advanced ICT knowledge. These teachers possessed degrees in Communication Science from a reputable local university. This school could benefit immensely if the head effectively delegated ICT programmes to the two experts.

4.1.3.6 Repairing old machines.

All the schools visited had many ICT devices especially computers that had been abandoned and were not working. Teachers in such schools encouraged their heads to repair them. The researcher noted that around 30% of computers in every institution had been placed in storerooms because certain touch ups were needed. Repairing these machines would greatly reduce sharing ratios for such devices.

4.1.4 Research question 4which states "To what extent is ICT in servicing available to school heads especially those in rural communities?" Responses from questionnaires and interviews were used to provide findings to this objective. Heads were asked to mention ICT in servicing programmes they had attended. Five out of ten heads indicated that they had attended at least one ICT training workshop while five heads indicated that they had not yet attended a workshop of that sort. Probing during interviews revealed that all the five heads who said they had attended an ICT workshop were referring to one workshop which had been conducted in the district three years ago. No other workshop had been conducted in the last three years for heads in Mutasa. It became clear to the researcher that ICT training workshops for heads were inadequate. Heads who were promoted in the last three years were still to benefit from such a programme. The researchers also noted that the only workshop which had been done in Mutasa was conducted three years ago and was only a two-day event. Such a workshop could not cover all aspects of ICT teaching and learning.

Information supplied by the Mutasa District Office also revealed that eleven out of forty-two schools were offering computers as a subject. This figure was still very low. Increasing the number of students writing computer examinations could greatly enhance ICT usage in schools.

4.1.5 Research question 5 which states that "What are the problems militating against ICT implementation in secondary schools?" Responses from questionnaires and interviews were used to provide findings to this objective. Observation was also very essential in providing information on problems that schools were facing. Question 8 on the questionnaire for heads required respondents to state problems that school leaders faced and how they could be solved. Additional problems were also raised in interviews. The following problems were identified by heads.

4.1.5.1 Cash flow problems.

This turned out to be the most popular problem. Seven out of the ten heads stated that they were facing financial problems. The fact that financial problems were being faced by schools could be seen by the fact that almost all the schools had inadequate ICT devices. Observations of structures also implied that such problems were being faced. At High School B, a laboratory with an incomplete roof was seen as presented in Figure 5.

Figure 5. Incomplete lab at High School B.

At High School C, the researchers also took note of leaking computer laboratory roof that needed attention as depicted in Figure 6. The administration at the school was failing to repair the ceiling due to other pressing financial commitments.

Figure 6. Leaking computer laboratory roof at High School C.

The problem of inadequate finances also forced school heads to enter into unfavourable contracts with unscrupulous suppliers of ICT equipment. Two schools stated that they had entered into such agreements. One of the schools, High School C, was given sixty computers and had to pay around two thousand dollars per term for renting computers (without the option of out rightly purchasing them). Last year, the current school head had to return twenty computers so as to reduce the rental which was due to the company.

4.1.5.2 Electricity.

Four schools mentioned that they did not have electricity and it was difficult to introduce ICT devices in those institutions. It also turned out that the national grid power supply was unreliable. Generators were seen in six out of ten schools visited.

4.1.5.3 Inadequate teachers.

The ratio of ICT teachers against pupils was also seen to be very high in all the schools. One head said:

I only have one ICT teacher for 642 students.

There is no way one teacher could adequately teach such a big number of students.

4.1.5.4 Inadequate ICT equipment.

This problem has already been discussed earlier on. Only one school had two computer labs. Junior and senior students had to share similar facilities in three schools that had computer labs. This was seen by the researcher at High School Cand is captured in Figure 7.

Figure 7. A Level Students doing research in the computer lab while a Form Two lesson was in progress at High School B.

High School A also successfully managed to convert a staffroom into a temporary computer laboratory, seen in Figure 8.

Figure 8. A staffroom that was converted into a computer laboratory at High School A.

The situation was almost similar at High School C. A staffroom had also been temporarily converted into a computer lab. Junior and senior students shared this laboratory. A positive thing about this High School was that a new computer block had been constructed. This block was expected to be commissioned soon because it was almost complete when this research was carried out.

5. Discussion and Interpretation

The researchers were able to get first-hand knowledge about the ICT situation in the schools that were visited. The researchers were pleased to note that ICT devices had been welcomed in most schools. The fact that seven out of ten heads had degrees also implied that a good number of heads must have been exposed to ICT. All these heads had heard about ICT devices, but some still needed to improve their attitude to ICT teaching and learning. Previous research studies have revealed the fact generally younger school leaders tended to be more passionate about ICT interventions. Findings of this research were able to support this idea.

The researchers noted that heads that had impressive ICT devices in their offices were fairly young. These heads accessed their records from databases which had been created at their schools and also used the Internet. Office for school heads who were old did not have many ICT provisions. High School A, which had the best ICT facilities, had a fairly young head. The head also controlled the Wi-Fi network at the school from his office. Data gathered from teachers however pointed to the fact that even old heads could also score highly in as far as embracing ICT was concerned. A good number of teachers stated that their school heads only needed to adopt a positive mind-set for them to be able to make maximum use of ICT in their schools. There was a close debate among teachers on the connection between age and introduction of ICT interventions by secondary school heads. The fact that age increases physical defects that could make leaders shun ICT could not be dismissed easily. Four out of ten heads were observed to be wearing spectacles and the researchers could only guess that they were doing that for reasons related to their sight. People like that could shun ICT devices like computers. One could however argue that devices like projectors could actually assist those people.

The researchers also noted that the head was a big factor in encouraging other staff members to use ICT devices. Teachers at High School A agreed that they were benefiting greatly from the head's ICT knowledge. All teachers who were given questionnaires praised their head for being the number one advocate of ICT teaching and learning at the school. There is no way a school head could motivate staff members to use technology that he or she did not use. The head should also play a big role in sourcing and financing ICT devices. Six out of seven teachers who filled in questionnaires at High School E indicated that their school head was a negative factor to ICT interventions because he overlooked them due to ignorance. Virtually no money was being allocated for the purchase of ICT gadgets at that institution. The school had one functional laptop, a photocopier and a printer. The school however owned a lot of obsolete computers. An attempt by an earlier head to establish a laboratory had been shelved by the present head. A sign pinned on the staffroom door up to the time of this research was sufficient proof that someone at one time was thinking seriously about ICT issues. The program me was affected by changes in the administrative structure at the school. A computer lab was never established at the school. An outsider could be misled into thinking that there was a functional lab

at the school but there were no ICT machines inside. An example of such misleading postage is shown in Figure 9.

Figure 9. Sign showing intention to convert a staffroom into a computer lab at High School E.

The issue of power supplies also turned out to be a big factor in ICT interventions. Schools that were close to the Mutare-Honde Valley highway were fortunate in that they were quickly connected to the national power grid. The same was not true of schools that were located far from this road. Without electricity, computerizing schools was proving to be a tall order. Eighteen schools that were still to be circuited for electricity supply were not going to have meaningful ICT interventions until they got connected to the national grid. The researchers also noted that even schools that had electrical power from ZESA needed to have another source of power. Generators were seen in seven schools which were visited. Some of the generators were however too small and unsuitable for providing power in a school set up.

The researchers also observed that school heads could not totally ignore ICT. Heads of small secondary schools made it clear that they were facing problems with programmes like ZIMSEC electronic registration for candidates.Nine out of ten schools which were visited possessed laptops and printers. These devices were mainly used for mandatory programmes. In August 2016, schools were requested to provide soft copies of records for their staff members to The Ministry of Primary and Secondary Education. Teachers had to first scan their documents. Events like these were seen to be forcing heads to make efforts to acquire ICT devices for their schools. Interviews with heads also revealed the fact that schools were being forced to purchase ICT machines because of the need to reproduce question papers for local exams. Question papers could be easily reproduced with the aid of computers, printers and scanners.

The researchers also noted that almost all the schools had poor revenue bases. High School D had the best financial position because it was a boarding school that attracted students from all over the country. High School A was blossoming boarding school which still faced a lot of challenges because it recently acquired boarding status. It was still not a first-choice school for the well to do parents. That accounted for limited ICT devices that were observed at the school. High School B and E's financial challenges were emanating from the fact these schools were council owned and were located in the middle of communal areas. The capacity of students to pay fees was limited. A connection between the financial base of the school and available ICT devices could be worked out by the researchers. High School D had state of the art ICT facilities due to a broad financial base and a knowledgeable head. High School E fared badly

due to the fact that the head was ignorant about ICT issues and the revenue base was limited.

6. Conclusion

The area of ICT continues to be a fertile territory for research. A lot however still remains to be done especially considering the fact that new ICT devices and programmes continue being rolled out and are significantly changing the way people operate across the globe. ICT research is also an area that is of interest to all education stakeholders. Teachers, students and administrators all need the help of technology at one time or the other. These devices are generally beneficial, but they however have to be treated with caution and should be used sparingly because they have their own negative effects. The researchers concentrated on interventions that were being made by school heads of Mutasa schools and challenges that were being faced. It would make sense for other people to study the effects of current ICT interventions on teachers and students. Effects of ICT have been studied extensively in the western world but not in this district. It would be appropriate for other researchers to find out how schools with a poor revenue base can acquire basic ICT devices. This kind of research would be a plus for educational institutions in the developing world.

7. Implications

Findings of this paper have important implications for school heads, teachers, and responsible authorities of schools. The researchers noted that heads should take the lead in encouraging staff members to use ICT devices. The head's office should therefore be the first technology centre at the school. The head should make use of ICT and should be connected to the Internet. The school head can also make use of resources like projectors during presentations and meetings. It has also been noted that heads should not be deterred by age when it comes to ICT interventions. Heads of schools should adopt the right state of the mind and warm up to ICT devices. A negative attitude can stifle ICT programmes.

It is also important for heads not to rush into signing agreements for ICT equipment. There is need to consult before entering into agreements that can place the school at a disadvantage financially. Rushed decisions can prove to be costly as was observed at two schools that obtained computers under very unfriendly terms.

The majority of school heads were also found to possess inadequate ICT knowledge despite having some degrees. Some heads attained degrees without having to click a computer button because initial ICT education was very theoretical. It is therefore imperative that such head senrol for courses that can better their practical ICT knowledge. The Ministry of Primary and Secondary Education should also play a more active role in ensuring that heads are staff developed on ICT fusion into lessons. Workshops should be organized at frequent intervals and mechanisms should be put in place to ensure that all heads attend. Such workshops should also serve as a platform to encourage heads to change the way they view ICT. Since the ICT world is dynamic and ever-changing, workshops should also be used to discuss common strategies for approaching ICT issues in education.

Responsible authorities also have a big role to play in ensuring that ICT interventions are introduced at their institutions. These authorities should take the initiative in making sure that funds that can be channelled to ICT programmes are made available. Various fundraising mechanisms can be spearheaded by responsible authorities for schools.

8. Recommendations

No school can afford to ignore ICT especially in this era where interconnectedness and Internet of Things are key drivers of a nation's economy. A secondary school head who does that will quickly become irrelevant and will become a liability to his institution. The fact that most schools do not have enough funds should not be used as an excuse to stall the use of digital technology in learning. Heads are therefore required to fundraise for ICT programs. They should involve their local community. It is also essential for school heads to construct real computer laboratories and also ensure that equipment that is in use is matching with dates. Qualified personnel should be engaged to repair and service devices like computers. Computers that are properly serviced tend to last longer. Properly servicing machines will also avoid a situation where ICT devices are put to waste and this increases access to the equipment's by pupils.

In addition, mobile ICT intervention could be introduced as an enabler for educating children. More and more people are embracing and using one form of mobile devices such as feature phones, smart phones and tablet PCs. These mobile devices are improving in terms of physical capacity and support for basic ICT literacy activities while becoming a little bit more affordable. Such mobile devices could be taken advantage of in the classroom to help boost the literacy of both the teachers and the learners.

The problem of negative attitudes to ICT devices can also be rectified by policy making that makes it mandatory for every pupil to do computers up to a certain age. At the moment the Ministry of Education is just encouraging the use of computers in schools, but this is not enough. A policy that makes it compulsory for students to study computers and other ICT devices is desirable.

The government of Zimbabwe is also advised to give priority to the electrification of rural secondary schools. Heads whose schools are still to be electrified should seriously engage government agencies like Rural Electrification Authority (REA). Establishing REA was really a commendable move, but this parastatal now needs to be capacitated to provide electricity to all public places like schools and clinics in rural areas. Terms of electrifying the schools should not prove to be prohibitive and out of reach for the already impoverished rural institutions.

The researchers were also alarmed by the high figures of abandoned ICT machines in the schools. School heads are encouraged to employ qualified personnel to frequently service and upgrade machines like computers, printers and photocopiers. Students also need to be encouraged to use ICT machines properly so as to make them last longer.

The researchers also strongly recommend the idea of delegation. There is no way a school head can know everything about ICT. The head is therefore encouraged to work with people who are knowledgeable in the area. The school head should take seriously advice that can come from ICT experts.

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