Abstract: Research shows that ICT plays a leading role in promoting the economy of a country. Studies have shown that the rapid development of economies in countries like China, Brazil, India, Russia and other developed economies can be attributed to the impacts of ICT. Kenya vision 2030, which was formulated to make Kenya a middle-level economy by lowering cost of doing business, improving security and providing Kenyans with a friendly working environment, recognized this, by placing implementation of ICT in schools at center of achieving the vision. While other countries have achieved over 41% implementation of ICT in secondary schools, the percentage in Kenyan schools remains very small. It is with this background that this study sought to analyze the determinants of the National ICT strategy implementation in public secondary schools in Nairobi County in Kenya. Specifically, the study sought to evaluate the effect of ICT infrastructure; ICT development; ICT legal and regulatory framework and ICT integration on the national ICT strategy implementation.

Keywords: ICT, infrastructure, development, regulatory framework integration, strategy implementation

1. Introduction

According to Oliver, (2012) the rapid and pervasive implementation of new information and communication technologies (ICT) in the education system raises expectations regarding its potential for and contribution to the improvement of education. Combination of technologies have brought rapid changes in some areas, predominantly in knowledge management, covering aspects of knowledge creation, processing, storage, sharing, dissemination, collaboration and human resource development, in the level of education and training as well as work output and productivity. Leveraged by human capacity, this has led to the creation of the current popular advantages referred to as ‘Information and Communication Technology (ICT)’ (Aduwa-Ogiegbaen & Lyamu, 2015).

In spite of the accelerated implementation pace of ICT strategy in the educational system, including connection to the Internet, we are only at the beginning of a long process (Dzidonu, 2010). ICT provides a powerful paradigm for economic development. Telecommunications infrastructure is the means through which information technology products and services are delivered to consumers (for local consumption and exports (Aguyo, 2010). According to Albirini, (2006) the economic benefits of information technology cannot be delivered to the economy and society without fast and competitive telecommunications.

ICT has impacted the way business is conducted, facilitated learning and knowledge sharing, and generated global information flows, empowered citizens and communities, resulting in a global information society (Sahin, 2006). Information and Communication Technology (ICT) permeates the business environment and underpins the success of modern corporations as well as providing government with cost efficient civil service systems (Rebecca & Marshall, 2012). According to Priscilla, Nida, Khambari, and Wong, (2008) countries must be able to benefit from the technological developments. To be able to do so, a cadre of professionals has to be educated with a sound ICT-background, independent of specific computer platforms or software environments.

2. Local Perspective of the National ICT Strategy Implementation

In Kenya, the Ministry of Education developed Kenya Education Sector Support Program (KESSP)
in 2005 that featured ICT as one of the priority areas with the aim of mainstreaming ICTs into the teaching and learning process (Republic of Kenya, 2009). The National ICT Policy embedded this intent as a national priority and provided the impetus for the ministry to develop its sector policy on ICT in Education. The Ministry of Education was given the mandate to lead the monitoring and evaluation of the strategy's implementation, guided by overall government policies on education and ICT, specific education strategic documents for implementing its mandate, and global goals such as Education for All (EFA) and the Millennium Development Goals (MDGs).

The National ICT Strategy for Education and Training has fourteen components or rather objectives to be implemented. For the purpose of study, only four will be looked at with relevance to secondary schools. In 2008/2009, the Ministry selected three schools per district and each was given 1.5 million shillings. This money was to cater for buying of computers, installation of local area network and Management Information System and training (Kariuki, 2014).

3. Objectives of the Study

3.1 General objective
To analyze the determinants of the national ICT strategy implementation in public secondary schools in Nairobi county in Kenya

3.2 Specific objectives

i. To evaluate the effect of ICT infrastructure on the national ICT strategy implementation in public secondary schools in Nairobi county in Kenya.

ii. To establish the influence of ICT development on the national ICT strategy implementation in public secondary schools in Nairobi county.

iii. To establish the influence of ICT legal and regulatory framework on the national ICT strategy implementation in public secondary schools in Nairobi county.

iv. To examine the effect of ICT integration on the national ICT strategy implementation in public secondary schools in Nairobi county in Kenya.

3.3 Research questions

i. How does ICT infrastructure affect the national ICT strategy implementation in public secondary schools in Nairobi County in Kenya?

ii. What is the effect of ICT development on the national ICT strategy implementation in public secondary schools in Nairobi County Kenya?

iii. To what extent does ICT legal and regulatory framework affect the national ICT strategy implementation in public secondary schools in Nairobi County in Kenya?

iv. How does ICT integration affect the national ICT strategy implementation in public secondary schools in Nairobi County in Kenya?

4. Scope of the Study

The study used descriptive study design to analyze the determinants of the national ICT strategy implementation in education and training in public secondary schools in Nairobi County in Kenya. The study concentrated on four variables; ICT infrastructure, ICT development, ICT legal and regulatory framework and ICT integration in implementation of the national ICT strategy in public secondary schools in Nairobi County in Kenya.

The target population for this study consisted of all public secondary schools in Nairobi County. The County has 60 public secondary schools which are categorized as Boys schools, Girls schools and mixed day/boarding schools. There are 29 mixed day/boarding schools, 16 girls’ schools and 15 boys’ schools making a total of 60 schools. In sixty schools there are 60 Head teachers and 60 ICT/curriculum teachers. The study sampled each school principal and the ICT/curriculum teacher in data collection where in sixty schools there are 60 Head teachers and 60 ICT/curriculum teachers. Thus, a sample of 120 respondents was used.

5. Limitation of the Study

The study is a preliminary descriptive study to the determinants of the national ICT strategy implementation in education and training in public secondary schools in Nairobi County in Kenya. The study covered all public secondary schools in Nairobi in Kenya as the case study. The study experienced the challenge of reluctant of respondents to disclose some data and information they deemed confidential or some of respondents did not reveal some of information due to fear of victimization. Since the study used questionnaire as an instrument for data collection, some respondents were reluctant in filling the questionnaire where some questionnaires were returned late, unfilled and some were not returned at all.
This was mitigated through constant reminder to the respondents during the period they were having the questionnaire. The study presented an introduction letter obtained from the university to the organization management and this helped to reduce suspicion and enable the organization management to disclose much of the information sought by the study.

6. Empirical Review

The empirical review bring into light previous research studies conducted on the field of research or study. It involves related study or exact previous study on the area of research. The empirical review encompasses the findings and recommendations in the previous studies on the determinants of the national ICT strategy implementation.

6.1 ICT infrastructure

According to Liverpool, (2012) study effective introduction of ICT technology into schools is largely dependent upon the availability and accessibility of ICT resources that is, hardware, software, and communication infrastructure. Therefore, if technology cannot be accessed as in many educational institutions in sub-Saharan Africa, Kenya included, then, its integration is likely to face challenges or progresses slowly, (Liverpool, 2002). However, Bransford & Brown, (2010) in their study noted that, the situation has been improving in the last few years. Schools are increasingly being equipped with computers for teaching, learning and administrative purposes; connectivity is improving and the students are enthusiastic about using computers for learning despite inadequate computers in the institutions (Bransford & Brown, 2010).

6.2 ICT development

Teachers’ ICT skills and access to professional development play a significant part in implementation of ICT in public schools. Many studies show that if teachers view ICT programs are either satisfying their own needs or their students’ needs, it is likely they would implement it in school. Research suggests teachers’ attitudes, beliefs, adequacy, and skills influence successful implementation of ICT in schools (Hennessy 2010).

Unfortunately, in many African countries, lack of well trained teachers and low levels of teachers’ ICT skill and knowledge has been recognized as major obstacle in implementation of ICT in schools (Dzidonu, 2010). For efficient implementation of ICT in schools, there should be adequate personnel that have correct skills. Where such skills are missing, it would be difficult to fully implement the technology in schools. Research shows that meeting the severe deficit of skilled, competent and qualified teachers is the most challenging factor affecting most schools in the continent (Hennessy, 2010).

To successfully implement ICT in schools, there should have comprehensive pre-service courses on ICT that equips teacher trainees with the required skills. A study by Higgins, & Moseley, (2011) revealed that inability of teachers to understand why they should implement ICT in teaching and how exactly to implement was an impediment to its implementation. Unfortunately, many teachers” training institutions in Africa continue to teach more about what is ICT rather than teaching how to use it during teaching and learning in classroom.

In addition, in-service courses for subject teachers already in the professional should be developed that will guide them on how to use ICT during teaching and offer them basic skills needed for its implementation. Many authors believe that a continued professional development of teachers can help to successfully implement ICT in schools (Higgins, & Moseley, 2011, Dzidonu, 2010). A promising way forward should be a sustained professional development that draws on teachers local professional capabilities, supports reflective classroom performance, and encourages peer learning by teachers of same age group and similar subjects. Teachers need to become constant learners, while teaching and even learning from students.

6.3 ICT legal and regulatory framework

According to Kozma (2012) policymakers are in a unique position to bring about change. This is illustrated in a study of 174 ICT-supported innovative classrooms in 28 countries. In 127 cases, there was an explicit connection between the innovation and national policies that promoted the use of ICT (Jones, 2012). But while the introduction of ICT policy is necessary for change, it is not sufficient to result in its implementation or impact (Tyack & Cuban, 2014).

Policies can, of course, fail to succeed and this happens when: i) they are viewed as mere symbolic gestures; ii) teachers actively resist policy-based change that they see as imposed from the outside without their input or participation (Tyack & Cuban, 2000); iii) they do not have explicit connections to instructional practice (e.g. focus on hardware rather than their relationship to pedagogy); iv) they do not provide teachers with an opportunity to learn the policies and their instructional implications; and v)
there is a lack of programme and resource alignment to the policies’ intentions (Cohen & Hill, 2011).

Despite the importance of ICT in schools and the strategies developed by the government and other stakeholders, as formulated in sessional paper no. 1 of 2005, research has revealed that several schools were not efficiently implementing ICT to support teaching, learning and management in school. Manduku et al (2010) observed that despite the benefits of ICT, the school management had not fully implemented the policies developed by the Ministry of Education. Laaria, (2013) assert that some schools had developed guidelines on how to implement ICT but no attempt was made to implement them. This prompted an investigation of challenges that hindered efficient implementation of ICT in public secondary schools in Nairobi County.

6.4 ICT integration

Nchunge, Sakwa and Mwangi (2013) observed that many schools teachers are ill equipped to effectively integrate ICT in classroom due to inadequate number of computing infrastructure including computers, communication infrastructure involving telecommunication structures and roads as well as internet connectivity. This shows a very slow integration pace and may lead to all benefits of ICT internet connectivity were not represented in the sample. Furthermore, Kiptalam and Rodrigues (2010) used of questionnaires only to collect data collection, providing only quantitative data. However, there is need to employ qualitative approaches so as to obtain in-depth understanding as far as implementation of ICTs among secondary school teachers is concerned.

6.6 Research gaps

Educational systems around the world are under increasing pressure to use Information and Communication Technology (ICT) to teach students the knowledge and skills needed in the 21st century (Omwenga, 2007). Development and application of ICT in African institutions of higher learning is critically important if the continent is to reduce the knowledge, technological and economic gaps between itself and the rest of the world (Andoh, 2012).

Manduku et al (2010) observed that despite the benefits of ICT, the school management had not fully implemented the policies developed by the Ministry of Education. While the ratio of one computer to 15 students is the norm in most developed countries, the ratio in Africa stands at one computer to 150 students. This ratio is even wider in disadvantaged regions and areas. Despite developments in the use of ICT in universities in Kenya, secondary schools still lag behind in ICT implementation. Many of the public secondary schools in Kenya have tried to progress in their implementation of ICT’s, but it has not been effective (Government of Kenya, 2007).

According to Laaria, (2013) in Kenya, the ratio for university and colleges is one computer to 45 students, one computer to 120 students at secondary school level while access at the primary school level remains much more limited at one computer to 250 students. This suggests that ICT implementation in public secondary schools could be caused by a variety of problems and thus, need for this study analyze the determinants of the national ICT strategy implementation in education and training in public secondary schools in Nairobi County in Kenya. However, few studies such as Bauer and Kenton (2005) were of the view that possessing ICT skills cannot guarantee effective use of computers in teaching.

Dalton, (2009) in his study, problems affecting adoption technology by mathematics and science teachers in secondary schools found out that teachers with lower ICT proficiency are not willing and have less confidence to use ICT for teaching. This suggests that teachers’ information communication technological skills are critical for successful ICT implementation in the classroom. The study aimed at
mitigating the gaps in research by analyzing the determinants of the national ICT strategy implementation in public secondary schools in Nairobi County in Kenya.

7. Methodology
7.1 Research design

A research design refers to a plan or a map or a framework that acts as a guide to a researcher on how to execute the investigation. Kothari, (2004) defines a research design as the scheme, outline or plan that is used to generate answers to research problems. In order to clearly analyze the determinants of the national ICT strategy implementation in public secondary schools in Nairobi County in Kenya, descriptive research design was used. This research design was preferred because of its ability to determine and report the way things are and also helps a researcher to describe a phenomenon in terms of attitude, values and characteristics (Mugenda, 2008).

7.2 Sample size and sampling procedure

Mugenda, (2008) observed that researchers select a sample due to various limitations that may not allow researching the whole population. According to Kothari (2004) a representative sample is one which is at least 10% of the population thus the study sample involved all head teachers and ICT/curriculum teachers in all public secondary schools in Nairobi County. The study sampled each school principal and the ICT/curriculum teacher in data collection where in sixty schools there were 60 Head teachers and 60 ICT/curriculum teachers. Therefore a sample of 120 respondents was used.

Table 1: Sample size

<table>
<thead>
<tr>
<th>Category of schools</th>
<th>Total number of schools</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed day/boarding schools</td>
<td>29</td>
<td>58</td>
</tr>
<tr>
<td>Girls’ schools</td>
<td>16</td>
<td>32</td>
</tr>
<tr>
<td>Boys schools</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>60</td>
<td>120</td>
</tr>
</tbody>
</table>

7.3 Data Collection Instruments

According to Ngechu (2006), Barampuram & Zhang (2011), Hooykaas (2010) & Rivera et al., (2012) there were many methods of data collection. The choice of a tool and instrument depends mainly on the attributes of the subjects, research topic, problem question, objectives, design, expected data and results. The study used both primary and secondary data. Primary data was gathered by use of questionnaires, while secondary data was obtained from published documents or materials such as journals and magazines. These supplemented the primary data received from questionnaires.

A research questionnaire was used as the main instrument for data collection which is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from the respondents. The questionnaire was structured to provide for open and closed ended questions. The study considered questionnaires for they have advantages over other types of research instruments in that they are cheap, do not require as much effort from the questioner as verbal or telephone surveys and often have standardized answers that make it simple to compile data.

A cover letter from JKUAT Nairobi CBD Campus was taken along to enable the administering of the questionnaire. The respondents were assured of confidentiality of their names and responses and that the responses were not be handled by any other person but rather was used purely for academic purposes. Each questionnaire was coded and only the researcher was able to know which person responded. The coding technique was only used for the purpose of matching returned, completed questionnaires with those delivered to the respondents.

7.4 Pilot Study

According to Mugenda, (2003) pilot test is necessary and the validity of a study. A pilot test was conducted using questionnaires administered to school head teachers and ICT/curriculum teachers. This constituted 10% of the 60 public schools in Nairobi County for school head teachers and ICT/curriculum teachers (10% of 60) = 6 was selected using simple random sampling. In each school the head teachers and ICT/curriculum teachers were targeted. This constituted the respondents in each school and therefore the total number of the respondents for the pilot was 6 respondents. The pilot was undertaken to pretest data collection instrument for validity and reliability. According to (Orodho, 2003) a pilot study is necessary for testing the reliability of data collection instruments.

8. Findings, Data Analysis and Discussion
8.1 Response Rate
The study targeted 120 officials. However, those who completed and submitted their questionnaires were 103 while the rest 17 did not respond to the questionnaire. This is an indication that the response rate for the study was 85.8%.

8.2 Correlation Analysis

Variable relationship was based on Pearson correlation coefficient (r). This helped to show the relationship between all the variables under study. Correlation analysis indicated that all the variables were positively correlated with each other. There is a strong positive correlation of r value 0.805 between ICT integration and National ICT strategy implementation. There is a also strong positive correlation of r value 0.755 between ICT infrastructure and National ICT strategy implementation. A strong positive correlation of r value 0.769 also exists between ICT development and National ICT strategy implementation. Moreover, there is a strong positive correlation of r value 0.780 between ICT legal and regulatory framework and National ICT strategy implementation.

Table 2: Correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>ICT development</th>
<th>ICT infrastructure</th>
<th>ICT development</th>
<th>ICT legal and regulatory framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICT integration</td>
<td>0.76</td>
<td>0.75</td>
<td>0.75</td>
<td>0.78</td>
</tr>
<tr>
<td>ICT infrastructure</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>ICT development</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>ICT legal and</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>regulatory framework</td>
<td></td>
<td></td>
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<td></td>
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</tbody>
</table>

8.3 Regression Analysis

Through regression analysis, the Coefficient of determination (R square) was used to show the extent to which any change in dependent variable was explained by the independent variables collectively. From the findings, R square was 0.793 which indicates that ICT integration, ICT infrastructure, ICT development and ICT legal and regulatory framework collectively influence approximately 79.3% of the change in National ICT strategy implementation. The rest of the changes (that is 20.7%) in National ICT strategy implementation is caused by other factors except the ones covered by the independent variables.

Table 3: Coefficient of determination on National ICT strategy implementation

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>R</th>
<th>Adjusted R</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Square</td>
<td>Square</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICT integration</td>
<td>0.891</td>
<td>0.793</td>
<td></td>
<td>0.719</td>
</tr>
<tr>
<td>ICT infrastructure</td>
<td>0.75</td>
<td>0.48</td>
<td>1.00</td>
<td>0.175</td>
</tr>
<tr>
<td>ICT development</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
<td>0.75</td>
</tr>
<tr>
<td>ICT legal and</td>
<td>0.75</td>
<td>0.48</td>
<td>1.00</td>
<td>0.75</td>
</tr>
<tr>
<td>regulatory framework</td>
<td>0.75</td>
<td>0.48</td>
<td>1.00</td>
<td>0.75</td>
</tr>
</tbody>
</table>

8.4 Analysis of Variance (ANOVA)

At this level F-test was used with Analysis of variance (ANOVA) used to generate the F value. The ANOVA showed relationship in the variables between and within the measure of the dependent variable. It reflects the magnitude the model has on the data compared to those that are not considered in the model (residual).

According to the ANOVA results, the probability value for the regression model was 93.621. Given that F_{Critical} (3.719) is less than F_{Calculated} (93.621). The overall goodness of fit can be summarized by calculating the fraction of total variance explained by
the fit which is presented by the R square. Since the level of significance was 0.001, and \( F_{\text{calculated}} \) was greater than \( F_{\text{critical}} \), it implies that there was goodness of fit of the model. Given the high R square value of 0.793, it implies that independent variables for this study exhibited a high/significant goodness of fit. Moreover, the ANOVA shows the four independent variables (Change in ICT integration, ICT infrastructure, ICT development and ICT legal and regulatory framework) are critical in determining the dependent variable (National ICT strategy implementation).

<table>
<thead>
<tr>
<th>Table 5: Analysis of Variance (ANOVA)</th>
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<tbody>
<tr>
<td>Sum of Squares</td>
</tr>
<tr>
<td>Regression</td>
</tr>
<tr>
<td>Residual</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

9. Summary of the Findings

The purpose of the study was to analyze the determinants of the national ICT strategy implementation in public secondary schools in Nairobi County in Kenya. In particular, the study sought to evaluate the effect of ICT infrastructure; ICT development; ICT legal and regulatory framework and ICT integration on the national ICT strategy implementation in public secondary schools in Nairobi County in Kenya.

9.1 Effect of ICT Infrastructure

With respect to the effect of ICT infrastructure, the overall effect averaged at a mean of 4.3 with a standard deviation of 0.8. Respondents affirmed that the major effect is from electricity with the highest mean of 4.5 with a low deviation of 0.8. This is followed by the effect exerted by Computers, laptops and Projectors (mean = 4.3; Sdv 0.9) and internet and network connectivity (mean = 4.1; Sdv 0.7) in that order. From correlation analysis, the Pearson correlation coefficient between ICT infrastructure and National ICT strategy implementation was 0.755 indicating a strong positive correlation between ICT infrastructure and National ICT strategy implementation. From regression analysis the standardized Beta coefficient for ICT infrastructure in the estimated regression model was 0.511 indicating that a unit increase in ICT infrastructure increases National ICT strategy implementation by 0.511 units.

9.2 Influence of ICT Development

Pertaining to the influence of ICT development, its overall rating stood at a mean of 4.0 with a standard deviation of 0.9. In particular, findings indicated that the ICT development aspect that exerts the greatest effect, is ICT Personnel training (mean = 4.4; Sdv 0.6) followed by ICT skills and competence (mean = 4.2; Sdv 0.9). ICT training material was found to have a moderate effect as implied by its lower mean of 3.5. From correlation analysis, the Pearson correlation coefficient between ICT development and National ICT strategy implementation was 0.769 indicating a strong positive correlation between ICT development and National ICT strategy implementation. From regression analysis the standardized Beta coefficient for ICT development in the estimated regression model was 0.373 indicating that a unit increase in ICT development increases National ICT strategy implementation by 0.373 units.

9.3 Influence of ICT Legal and Regulatory Framework

From the findings, the overall effect of ICT legal and regulatory framework was rated at a mean of 4.1 with a standard deviation of 0.7. Specifically, its greatest effect was attributed to ICT Standards as indicated by its highest mean of 4.3 and a standard deviation of 0.8. This was followed by ICT policy (mean = 4.1; Sdv 0.7) while the effect of ICT regulation compliance was last at a mean of 3.9 and a standard deviation of 0.7. From correlation analysis, the Pearson correlation coefficient between ICT legal and regulatory framework and National ICT strategy implementation was 0.780 indicating a strong positive correlation between ICT legal and regulatory framework and National ICT strategy implementation. From regression analysis, the standardized Beta coefficient for ICT legal and regulatory framework in the estimated regression model was 0.425 indicating that a unit increase in ICT legal and regulatory framework increases National ICT strategy implementation by 0.425 units.

9.4 Effect of ICT Integration

Regarding the ICT integration, its overall effect was rated at a mean of 4.3 with a standard deviation of 0.7. This implies that ICT integration also has a great effect on national ICT strategy implementation. In line with this, respondents highly affirmed that cost
of using ICT exerts the major effect with a mean of 4.4 and a minimal deviation of 0.6. On the same note, the effect of ICT curriculum and Administrative support were rated equally at a mean of 4.3 each. From correlation analysis, the Pearson correlation coefficient between ICT integration and National ICT strategy implementation was 0.805 indicating a strong positive correlation between ICT integration and National ICT strategy implementation. From regression analysis, the standardized Beta coefficient for ICT integration in the estimated regression model was 0.697 indicating that a unit increase in ICT integration increases National ICT strategy implementation by 0.697 units.

10. Conclusions

From the findings, it can be inferred that the national ICT strategy implementation has been moderate. So far, the implementation has been steered through the very strong commitment by the Minister of Education and the Permanent Secretary in the ministry in demonstrating the importance of ICT in education. The strong belief in stakeholders that the incorporation of ICTs is essential at all education levels and the perception that this is shared from the political to the student level has also influenced the implementation positively. The provision of affordable infrastructure to facilitate dissemination of knowledge and skill through e-learning platforms by the government has also made a positive contribution. However, implementation is being choked by failure by the government to create awareness of the opportunities offered by ICT as an educational tool to the education sector as well as not being able to promote the development of an integrated e-learning curriculum to support ICT in education. Considering the ICT infrastructure, ICT development, ICT legal and regulatory framework and ICT integration, the inferences derived from the findings are as presented in sections 5.3.1 through 5.3.4.

10.2 Effect of ICT Infrastructure

Generally, ICT infrastructure greatly affects national ICT strategy implementation. To enhance national ICT strategy implementation by addressing the ICT infrastructure issues, the first priority should be on electricity installation and maintenance; then avail and maintain ICT hardware (computers, laptops and projectors) and further ensure that there is a stable internet and network connectivity.

10.3 Influence of ICT Development

The national ICT strategy implementation in public secondary schools is greatly determined by ICT development. In particular, it can be deduced that ICT Personnel training and ICT skills and competence are fundamental in achieving the desired levels of implementation. Moreover, ICT training materials are also vital in realizing ICT development for enhanced national ICT strategy implementation.

10.4 Influence of ICT Legal and Regulatory Framework

The study concludes that ICT legal and regulatory framework is a major determinant of national ICT strategy implementation. This will however be realized when there are adequate and quality ICT Standards and ICT policy designed to promote national ICT strategy implementation. While this is important, it also necessary to ensure there is stakeholders’ compliance with the set regulation. That is to say, first have quality standards and policy, and then enforce compliance for the legal and regulatory framework to effectively promote national ICT strategy implementation.

10.5 Effect of ICT Integration

It was deduced that ICT integration also has a great effect on national ICT strategy implementation. In this regard, it was inferred that when considering ICT integration to improve the level of national ICT strategy implementation, cost of using ICT, ICT curriculum and Administrative support must be factored. The cost should be affordable, while the ICT curriculum should be relevant. Those charged with managing the implementation must also be supportive in the process.

11 Recommendations

In the light of the study findings, the following recommendations are proposed:

11.1 Effect of ICT Infrastructure

As a part of the implementation process all schools should have resources, both financial and technical, to help them to mitigate the effects of technical challenges that may choke the implementation process. It should be ensured that the hardware is readily available and functional at all times which means organizing for power back-ups in case of black outs. There is also need to team up with telecommunication companies to ensure
continuously stable and reliable internet connectivity is ensured. Moreover, the importance of financial resources to the success of the policy implementation cannot be underplayed. Hence, Governments should strategically plan and continuously support the process financially.

11.2 Influence of ICT Development

ICT training should be designed to incorporate self-learning methods that allow teachers to truly understand the benefits of ICT aligned to their independent teaching methods. This could include capitalizing on the technology being used, such as online professional development modules. To maintain these benefits over the long term, teachers and students must also be kept up to date with advances in technology, and know how and when to use it.

11.3 Influence of ICT Legal and Regulatory Framework

The government through the Ministry of Information, Communication and Technology should ensure that they develop adequate policies geared towards ensuring that ICT equipment procured and used to implement the national ICT strategy implementation are up to standards. In conjunction with the Ministry of Education, they also need to see to it that the secondary schools adhere to the set policies in as much as regulations online consumer protection are developed, enforcement mechanisms are strengthened to ensure that the regulations are fully enforced. Otherwise, if regulations are well constructed, without appropriate enforcement, their positive contribution will be minimal.

Ongoing feedback should be also be gathered from all relevant stakeholders especially the teachers to assess the applicability, relevance and clarity of the policy. It is recommended the policy also comprise an explicit outline of the evaluation and analysis processes to be used.

11.4 Effect of ICT Integration

Moreover, enabling teachers to integrate ICT into their pedagogy must be a priority. Teachers’ prior training should be considered including their current use of technology in the classroom, their existing ICT skills, and their gaps of knowledge. This information should guide the formulation of the professional development modules for teachers in the integration process.

ICT specialist personnel may be needed where teachers may have difficulties utilizing technology correctly and expertise should be readily availed to fix technical difficulties that may arise at any time.

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