Information Communication Technology Integration and Performance of Public Secondary Schools in Mombasa County, Kenya

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ABSTRACT

Global investment in ICT to improve teaching and learning in schools have been initiated by many governments. Despite all these investments on ICT infrastructure and professional development to improve education in many countries, ICT adoption and integration in teaching and learning have been limited. Technological revolution in schools has been set by theoretical inadequacies that have kept educational technology at the margins of the established educational system. Although there is an ICT policy for basic education in Kenya, little could be seen in the use of ICT as a pedagogical tool in teaching. The general objective of this study was to assess the effects of ICT integration on the performance of public secondary schools in Mombasa County, Kenya. The specific objectives of the study were to assess the effect of ICT user skills on performance of public secondary schools in Mombasa County, Kenya, to establish the effect of ICT infrastructure on performance of public secondary schools in Mombasa County, Kenya, to assess the effect of teachers' attitude to ICT on performance of public secondary schools in Mombasa County, Kenya and to assess the effect of managerial support on ICT on the performance of public secondary schools in Mombasa County, Kenya. This study employed a descriptive survey research design. The target population for this study constituted of 101 public secondary schools comprising of 24 Girls' Secondary schools, 12 Boys' Secondary schools and 65 Mixed Secondary schools. Therefore, the target population was 202 respondents comprising of 24 school principals and 24 teachers of computer from girls' schools,12 school principals and 12 teachers of computer from boys' schools, 65 school principals and 65 teachers of computer from mixed' schools. Stratified sampling method was used to select schools to ensure that all different subgroups are adequately represented in the sample. Proportionate sampling was used to select principals and teachers of computer from the sampled schools. The sample size used was 134 respondents comprising of 16 school principals and 16 teachers of computer from girls' schools,8 school principals and 8 teachers of computer from boys' schools, 43 school principals and 43 teachers of computer from mixed' schools. The main data collection tools for this were questionnaires for all the respondents then compiled, sorted, edited, classified and coded into a coding sheet and analysed using a computerized data analysis package known as Statistical Package for Social Sciences (IBM SPSS) version 20. The data was analysed using both descriptive and inferential statistic. The results were presented in graphs, tables, figures and charts. The study concludes teachers develop their competence based on the educational goals they want to accomplish with the help of ICT. The insufficient ICT infrastructure in most of the secondary schools in the region had contributed to the slow integration of ICT in the schools. Teachers' attitude determines the success of initiating and implementing educational technology in school's program and also teachers are fearful of trying new approaches which they perceive might have a negative impact on examination

results respectively. Management support in the integration of ICT includes funding, training and provision of required ICT facilities. The study recommends that the educational policy makers should put into considerations various concerns from educational stakeholders so that they bring workable strategies that would serve as lessons for improvement of educational practices. The government should ensure that secondary schools are supplied with necessary ICT infrastructure. There is a need for teachers to have their personal initiatives towards the available digital learning tools so as to enhance the teaching and learning process and their professional development. There should be comprehensive in-service courses and the school management should practice leadership promotion of collaboration and experimentation and teachers dedication to student-centred learning for effective ICT transformation.

Key Words: *Information Communication Technology, Information Communication Technology Integration, Performance of Public Secondary Schools in Mombasa County, Kenya*

1. INTRODUCTION

Information Communication and Technology (ICT) is used for capacity development and citizen empowerment. Ultimately, ICT can enhance teaching opportunities and outcomes for students, including students with intellectual disabilities (Anderson& Dexter, 2014). Global investment in Information Communication Technology (ICT) has been to improve teaching and learning in schools. This has been initiated by many governments in a view to enhance students' academic performance. Despite all these investments on ICT infrastructure, equipment and professional development to improve teaching in many countries, Buabeng-Andoh (2012) claimed that the huge educational investment have produced little evidence on improvement of public schools performance. Herold (2016), argues that there should be a general shift in thought by many school management to give necessary support through infrastructure, equipment and professional development so as to realize and achieve the desired goals of ICT integration in school.

Wango (2012) suggested that the quality of teaching and learning can be enhanced through improved teaching practices. The increasing changes in teaching practices and the need for creative, divergent and unexpected solutions to improve teaching and learning situations, require a challenging approach to the field of instructional practices (Steyn & Kamper, 2013). Liu (2016) carried out a study amongst elementary school classrooms and found that integration of ICT in classroom teaching enhanced student engagement and motivation, and helped the teachers to make more literature-based connections that were more entertaining and interesting to students. Improving school ICT facilities is therefore essential in view of the current global revolution in teaching due to the changing nature of teachers' work, the realities of the information age, new global partnerships and awareness of technological changes (Feldner, 2014). Schools should provide adequate ICT to enhance integration of ICT in

Public schools are learning institutions where learning activities are supported by public funds. They are maintained at public expense for the education of the children of a community. The government meets costs associated with teacher remunerations, supervision, inspection and management in public schools (Onsomu *et al*., 2015). The corporate governance structures in the public schools specify the distribution of rights and responsibilities among different participants, such as the board, managers, and other stakeholders. It also spells out the rules and procedures for making decisions on the schools affairs which may have been ignored or overlooked by the various stakeholders at one time or

other. A report by Ministry of Higher Education, Science and Technology (GOK, 2015) on secondary school teachers' implementation and use of ICT also indicated that the number of teachers skilled in ICT in secondary schools was low. The study revealed that out of the number available, few had ICT training effective in implementation and use of the technology in classroom. Out of 232 teachers in the sample, majority (57%) were reported to have trained at certificate level on basic computer skills, 73% were reported to have acquired ICT training through in-service courses and 43% were trained by private computer colleges. However Grismore (2012) states that it becomes ineffective for a teacher to use technology "for technology's sake without much contribution towards the desired objectives.

In 2006 the government disseminated National ICT policy on education with a section emphasizing that the government will encourage implementation and use of ICT in all public schools (GOK, 2005). Some of achievements so far include; connecting over 300 rural schools with electricity, equipping over 500 public secondary schools with computers, establishing a unit at Kenya Institute of Education (K.I.E) to provide leadership in implementation of ICT in schools, Launching of e-content for schools in March 2010 by K.I.E, partnering with several organizations and private sectors in provision of computers to schools, among others (Laaria, 2013). Despite its importance and strategies developed by government to implement ICT in schools most of public schools in the country are not effectively adopting and using ICT to support learning, teaching and management as intended (Manduku *et al*., 2012). Mombasa County is one of the 47 Counties in the Republic of Kenya. In this County, public schools have been equipped with computer facilities and all the teachers have been in-serviced through workshops organized by Kenya Institute if Curriculum Development (KICD) on how to integrate ICT in teaching and learning of all the subjects. Apart from this, an innovative teacher should be able to use other computer related software materials like internet, power point presentations, simulations among others to promote new learning environment in which enquiry and problem solving increases learners achievement. This is also likely to develop deeper understanding of subject skills and concepts by engaging them in active learning practices.

2. STATEMENT OF THE PROBLEM

Kenya has put in place an ICT policy that aims to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services. While ICT has penetrated many sectors including banking, transportation, communications, and medical services, the Kenyan educational system seems to lag behind. Kiptalam *et al*., (2014) observed that access to ICT facilities is a major challenge facing most African countries, with a ratio of one computer to 150 students against the ratio of 1:15 students in the developed countries. A survey by kandiri (2012) indicated that computer use in Kenyan classrooms is still in its early phases, and concluded that the perceptions and experiences of teachers and administrators do play an important role in the use of computers in Kenyan classrooms. However according to Zavieri (2014) without strong leadership in the highest echelons of power and a total paradigm shift, the current level of technology application and integration in the classroom will continue to be limited.

Albirini (2015) observe that technological revolution in schools has been set by theoretical inadequacies that have kept educational technology at the margins of the established educational system. Although there is an ICT policy for basic education in Kenya, little could be seen in the use of ICT as a pedagogical tool in teaching. In order for ICT to positively

foster development goals of secondary education, it must be employed effectively (UNDP, 2015). Although ICT is the engine for economic and technological development in the 21st century, a great deal of Kenyan secondary school curriculum instruction and administrative work is still manually executed.

The issue confronting the education system is how to transform the curriculum and teaching-learning process to meet the increasing pressure to use the new ICT to teach students in the 21st century. According to Farrel (2014) many teachers put emphasis on teaching about technology rather than teaching with technology and also these teachers continue using non-ICT based approaches in teaching various subjects despite the effort being made by the government of Kenya to equip schools with computer infrastructure. According to Gray and Lewis, (2010) despite having open access to technology, only 69% of teachers utilized the technology at hand on but also not in a consistent basis. In Kenya, use of ICT has not reached optimum level and none of the empirical study has fully addressed the level of integration of ICT required. Mombasa County has many schools equipped with computer facilities. With such a large investment in ICT infrastructure, teachers are expected to integrate ICT in their teaching and learning activities competently and effectively without caring about their perception, competency and challenges. Zimlich, (2015) even with regards to the amount and use of specific technology in the classroom, many teachers still fail to find ways to integrate technology into the classroom to align with educational goals. Berry and Westfall (2017) survey noted that there is less frequent ICT interaction in the classroom, compared to verbal interaction

A number of studies have been done concerning ICT in schools. For example, Palak and Walls (2012) study on teachers' beliefs and technology practices using a mixed-methods approach found that teachers mainly use technology to support their existing teaching approaches and rarely to foster student-centred learning. Ebert (2015) also states that in the real world Constructivist learning situations are more motivating to students through practical application and integration of ICT and knowledge. Awuor and Kaburu (2014) study on E-Learning in public institutions in Kenya: implementation challenges recommended that the government should introduce e-learning in teacher institutions and collaborate with e-learning software providers to incorporate e-learning in the current curriculum. Laaria (2013) revealed that despite efforts made by various stakeholders and importance of the ICT in education sector, the National ICT policy on education of 2006 has not been effectively implemented as was intended. Therefore, this study sought to investigate the effects of ICT integration on the performance of public secondary schools in Mombasa County, Kenya.

3. OBJECTIVES OF THE STUDY

The general objective of this study was to assess the effects of ICT integration on the performance of public secondary schools in Mombasa County, Kenya.
The specific objectives of the study were:
  i. To assess the effect of ICT user skills on the performance of public secondary schools in Mombasa County, Kenya.
  ii. To establish the effect of ICT infrastructure on the performance of public secondary schools in Mombasa County, Kenya
  iii. To assess the effect of teachers' attitude to ICT on the performance of public secondary schools in Mombasa County, Kenya

iv. To assess the effect of managerial support of ICT on the performance of public secondary schools in Mombasa County, Kenya

4. THEORETICAL LITERATURE REVIEW

The study was based on Roger's (2003) theory of Diffusion of Innovations. The theory that seeks to explain how, why, and at what rate new ideas and technology spread through cultures. The original diffusion research was done as early as 1903 by the French sociologist Gabriel Tarde. Diffusion research centres on the conditions which increase or decrease the likelihood that a new idea, product, or practice is adopted by members of a given culture or a social system. This was extended by Rogers (2003) hence at present is commonly known as Roger's theory of diffusion of innovation. Innovation diffusion research has attempted to explain the variables that influence how and why users adopt a new information medium, such as the Internet. The diffusion of information technology and telecommunications hardware, software, and services turns out to be a powerful driver of growth, having an impact on worker productivity (Bollou, 2002). Robinson (2009) observes that, instead of focusing on persuading individuals to change, the theory sees change as being primarily about the evolution or "reinvention" of products and behaviours so they become better fits for the needs of individuals and groups.

Each member of the social system faces his/her own innovation-decision that follows a 5-step process; Knowledge; person becomes aware of an innovation and has some idea of how it functions, Persuasion; person forms a favourable or unfavourable attitude toward the innovation, Decision; person engages in activities that lead to a choice to adopt or reject the innovation, Implementation; person puts an innovation into use, Confirmation; person evaluates the results of an innovation- decision already made (Sahin, 2006). This compels the user to continue implementation or later reject the technology. The integration or rejection of innovations is characterized by; the relative advantage, compatibility, simplicity, trial-ability and observe-ability. So understanding and utilizing diffusion networks can aid strategy aimed at quickly inducing system-wide change (Robinson, 2009). Given that education stakeholders are aware of the ICT innovations across the world, there is still poor integration of ICT in secondary schools. Rogers' diffusion of innovations theory is the most appropriate for investigating the factors influencing integration of ICT in secondary schools. This theory was relevant to the study because it tries to explain how an innovation, which may be about an idea, behaviour, or object, is adopted among population. Diffusion of Innovations Theory offers valuable insights into the process of social change. Therefore, argued that innovations that are perceived by individuals as having greater relative advantage, compatibility, trial ability, observe ability, and less complexity will be adopted more rapidly. However, in this context, because of the differences in personal experiences, environments, and technology needs, the teaching staff will certainly perceive the attributes of ICT differently.

This study was also based on Bertalanffy (1968) theory known as System Theory. According to this theory, a system can be said to consist of four things. The first is objects – the parts, elements, or variables within the system. These may be physical or abstract or both, depending on the nature of the system. Second, a system consists of attributes – the qualities or properties of the system and its objects. Third, a system has internal relationships among its objects. Fourth, systems exist in an environment. A system, then, is a set of things that affect one another within an environment and form a larger pattern that is different from any of the parts (Whitchurch & Constantine, 2009).

According to Whitchurch and Constantine (2009) the fundamental systems-interactive paradigm of organizational analysis features the continual stages of input, throughput (processing), and output. Several system characteristics are: wholeness and interdependence (the whole is more than the sum of all parts),correlations, perceiving causes, chain of influence, hierarchy, super-systems and subsystems, self-regulation and control, goal-oriented, interchange with the environment, inputs/outputs, change and adaptability.

This study was guided by the System Theory because schools are systems where the teaching/learning process is observed as a throughput (process) used to transform inputs students and resources into outputs (graduates with different skills and attitudes). In schools we also observe an interrelation between teachers, resources and students which constitute a sine quoi none condition for the effectiveness of the teaching/learning process. Realistically, any school has objectives to achieve and achieving them requires it to treat all the elements involved in the process (inputs like students, teachers and resources; throughput like teaching methods and outputs like graduates with different skills and attitudes) as interdependent.

5. CONCEPTUAL FRAMEWORK

Figure 1 shows the relationship between independent variables and dependent variable. The independent variables are ICT user skills, ICT infrastructure, teachers' attitude and management support and dependent variable is the performance of public secondary schools.
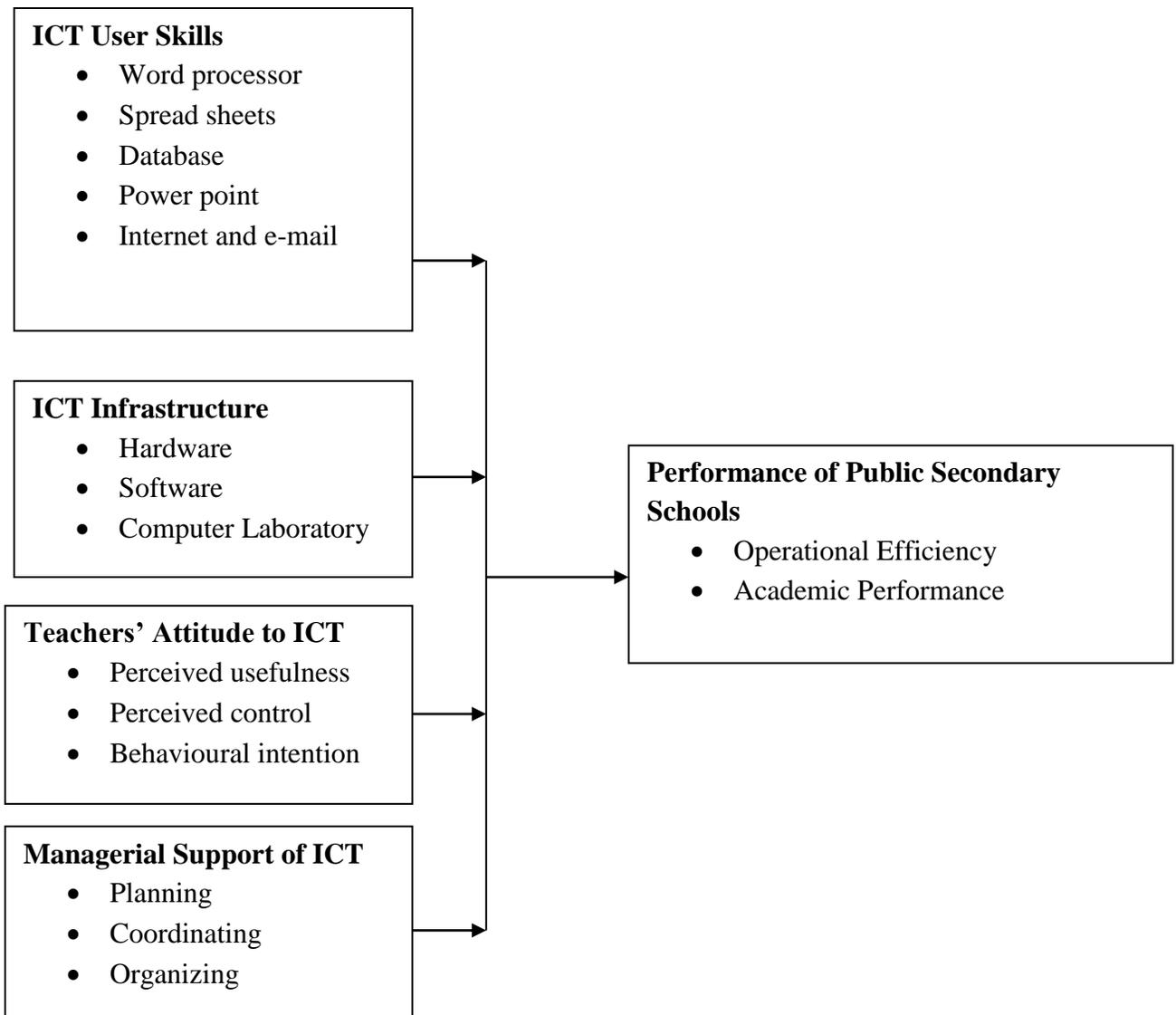
ICT User Skills
- Word processor
- Spread sheets
- Database
- Power point
- Internet and e-mail

ICT Infrastructure
- Hardware
- Software
- Computer Laboratory

Teachers' Attitude to ICT
- Perceived usefulness
- Perceived control
- Behavioural intention

Managerial Support of ICT
- Planning
- Coordinating
- Organizing

Performance of Public Secondary Schools
- Operational Efficiency
- Academic Performance

Figure 2.1: Conceptual Framework

6. RESEARCH METHODOLOGY

The study used descriptive research to collect information on the subject under study by observing the environment and describing their behaviour and to demonstrate relationships that exist between them. This research method helped to gain more insight about subject of study and define the relationship between the variables. Therefore, the descriptive design was adapted to describe the variables affecting ICT integration and their relation to performance of public secondary schools in Mombasa County. The target population for this study constituted of 101 public secondary schools comprising of 24 Girls' Secondary schools, 12 Boys' Secondary schools and 65 Mixed Secondary schools. Therefore, the target population was 202 respondents comprising of 101school principals and 101 teachers of computer. Stratified sampling method was used to select schools to ensure that all different subgroups are adequately represented in the sample. Sampling is a procedure, process or technique of choosing a sub-group from a population to participate in the study (Mugenda & Mugenda, 2003). It is the process of selecting a number of individuals for a study in such a way that the

individuals selected represent the large group from which they were selected. For the purpose of this study the identified strata was Girls' School, Boys' Schools and Mixed secondary schools. Proportionate sampling was used to select principals and teachers of computer from the sampled schools.

Taro Yamane's formula was used to determine the sample size. According to Hussey and Hussey (1997) a sampling error of less than 10% and confidence levels of more than 90% is acceptable, the study therefore adopted a sampling error of 5% to determine the minimum sample size that was used for the purposes of this study.

The formula for obtaining the sample size is shown below:

$$n = \frac{N}{1+N (e)^2}$$

Where: n=sample size

N=population size

e= level of precision/sampling error at .05

$$n = \frac{202}{1+202(0.05)^2} = 134$$

The sample size used was 134 respondents comprising of 67 school principals and 67 teachers of computer which make up of 66.3% of the target population (202). The sample size was differentiated in their strata based on the ratio of 0.663. This was completed in line with stratified technique. This was perfect for the reason that respondents belonged to one of a kind categories and each category has one-of-a-kind function from every other.

Questionnaires were used for the purpose of collecting primary quantitative data. Before processing the responses, the completed questionnaires were edited for completeness and consistency. The data was then coded to enable the responses to be grouped into various categories. The data was analysed by descriptive analysis such as means and standard deviations with the use of Statistical Package for Social Sciences (SPSS) version 2.0. The study conducted a multiple regression analysis to test the relationship between independent variables and dependent variable.

The regression equation was in the following form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where   Y= Performance of Public Secondary Schools

X_1= ICT User Skills

X_2= ICT Infrastructure

X_3= Teachers' Attitude to ICT

X_4= Managerial Support of ICT

$\beta1, \beta2, \beta3, \beta4$ and $\beta5$ are coefficients of determination

ε - Error

7. RESEARCH FINDINGS

A correlation analysis was carried out to establish the relationship that exists between ICt integration and performance of public secondary schools. Maina *et al.,* (2016) argued Pearson Correlation Coefficient is the most widely used method of measuring the degree of relationship between two variables. This ranges from -1 to +1, where -1 indicates a perfect negative correlation, 0 no correlation and +1 a perfect positive correlation. This assists a researcher in determining the magnitude and direction of the relationship between two variables. The results of the correlation analysis are presented in Table 1.

Table 1 Relationship between ICT integration and Performance

	Performance of Public Secondary Schools	ICT user skills	ICT infrastructure	Teachers' Attitude to ICT	Managerial support of ICT
Performance of Public Secondary Schools	1				
ICT user skills	0.536	1			
ICT infrastructure	0.526	0.29	1		
Teachers' Attitude to ICT	0.265	0.085	0.485	1	
Managerial support of ICT	0.275	0.032	0.233	0.578	1

From the findings shown ICT user skills and public secondary schools performance are positively related (0.536), ICT infrastructure is positively related with the public secondary schools performance (0.526) while Teachers attitude to ICT is positively related at (0.526). Managerial support of ICT is positively related with public secondary schools performance (0.275). The use of ICT user skills in public secondary schools was positively related with ICT infrastructure (0.29), Teachers' Attitude to ICT (0.085) and Managerial support of ICT (0.032). The use of ICT infrastructure was positively related with Teachers attitude to ICT (0.485) and Managerial support of ICT (0.233). Lastly Managerial support of ICT had a positive relation with Teachers attitude to ICT (0.578). This indicates any of the ICT integration had a positive correlation with performance of public secondary schools and ICT integrations had positive correlations among themselves.

Regression analysis was used to model, examine, and explore the relationships between performance of public secondary schools against the four independent variables (ICT user skills, ICT infrastructure, teachers' attitude and management support) used for the study, this was important in measuring the extent to which changes in one or more variables jointly affected changes in another variable. The results are presented on Table 2.

Table 2 Model summary of ICT integration

R	R Square	Adjusted R Square	Std. Error of the Estimate
.672[a]	.651	.433	.515

a. Predictors: (Constant), Managerial support of ICT, ICT user skills, Teachers' Attitude to ICT, ICT infrastructure

The findings shown in Table 2 above indicate the extent of variations on the public secondary schools performance which are explained by the independent variables. The R square value is 0.651. This means that the independent variables explain 65.1% of the variations in dependent variable. The rest 34.9% are explained by other factors.

Table 3: Analysis of Variance (ANOVA)

	Sum of Squares	Df	Mean Square	F	Sig
Regression	3.213	5	.6546	24.691	**.000[a]**
Residual	1.879	120	.265		
Total	5.315	125			

a. Predictors: (Constant), Managerial support of ICT, ICT user skills, Teachers' Attitude to ICT, ICT infrastructure

b. Dependent Variable: Performance of Public Secondary School

The findings shown on the table 3 indicate significance value is 0.00 which is less than 0.05 thus the model is statistically significance in predicting how various factors affect the performance of public secondary schools in Mombasa Kenya. The F critical at 5% level of significance was 24.691. Since F calculated is greater than the F critical (value = 6.546), this shows that the overall model was significant. The relationship ($p < 0.05$) indicated a linear relationship among the variables under the study meaning there was 95% chance that the relationship among the variables was not due to chance.

Table 4: Regression Coefficients of Performance of Public Secondary School

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	6.458				
ICT user skills	0.626	.331	.088	4.920	.002
ICT infrastructure	.539	.075	.084	1.850	.003
Teachers' Attitude to ICT	.606	.104	.791	4.060	.000
Managerial support of ICT	.412	.054	.565	2.058	.001

As per the SPSS generated table above, the equation ($Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$) becomes: **$Y = 6.548 + 0.626 X_1 + 0.539 X_3 + 0.606 X_3 + 0.412 X_4$**

Where   Y= Performance of Public Secondary Schools

X_1= ICT user skills

X_2= ICT competence

X_3= Teachers' attitude to ICT

X_4= Managerial support of ICT

The findings on the table 4.20 above indicate that when all the factors are held constant public secondary performance will increase by 6.458 units. When all the factors are held constant one unit use of ICT user skills increases the public secondary performance by 0.626 units. When all the factors are held constant a unit increase in the use of ICT infrastructure increases the public secondary performance 0.539 units. Similarly, a unit increase in the use of Teachers' Attitude to ICT holding other factors constant increases the public secondary performance by 0.606 units. The use of Managerial support of ICT holding the rest factors constant increases the public secondary performance by 0.412 units. This shows that the use of ICT have had a great impact on performance of public secondary school in Kenya. Wango (2012) suggested that the quality of teaching and learning can be enhanced through improved teaching practices. The increasing changes in teaching practices and the need for creative, divergent and unexpected solutions to improve teaching and learning situations, require a challenging approach to the field of instructional practices (Steyn & Kamper, 2013). Improving school ICT facilities is essential in view of the current global revolution in teaching due to the changing nature of teachers' work, the realities of the information age, new global partnerships and awareness of technological changes (Feldner, 2014). Schools should provide adequate ICT to enhance integration of ICT in teaching.

8. CONCLUSIONS

The success of educational innovations depends largely on the skills and knowledge of teachers. Therefore, teachers should develop their competence based on the educational goals they want to accomplish with the help of ICT. The level of ICT training of majority of the teachers is far from being satisfactory due to lack of proper exposure during formative training in initial teachers training institutions. Training through seminars/conferences during in-service courses did not give enough time for teachers to practice well with ICT tools. The insufficient power supply in most of the secondary schools in the region had contributed to the slow integration of ICTs in the schools. This was because most of the secondary schools, especially in the day schools had inadequate power backup. ICT spending is mostly on hardware, software, infrastructure and training. ICT integration in schools therefore requires investment in equipment, professional development and teacher training, technical support, connectivity and digital learning process. The ICT innovation and infrastructure in schools include hardware, software, internet connectivity and electrification. The kind of infrastructure available in schools depends on the users and their knowledge and skills which is pre-service and the in-service training.

To successfully initiate and implement ICT in school's program depends strongly on the teachers' support and attitudes. Teachers are fearful of trying new approaches which they perceive might have a negative impact on examination results respectively. Teachers who are not using new technology such as computers in the classroom are still of the opinion that the use of ICT has no benefits or unclear benefits. If teachers' attitudes are positive toward the use

of educational technology then they can easily provide useful insight about the adoption and integration of ICT into teaching and learning processes. Factors such as support, funding, training and facilities influence teachers 'adoption and integration of technologies into their classrooms. Teachers' professional development is a key factor to successful integration of computers into classroom teaching. Teachers need to be assured by their managers that technology can make their teaching interesting, easier, more fun for them and students, more motivating and more enjoyable.

9. RECOMMENDATIONS

The educational policy makers should put into considerations various concerns from educational stakeholders so that they bring workable strategies that would serve as lessons for improvement of educational practices. However, there is a need for teachers to have their personal initiatives towards the available digital learning tools so as to enhance the teaching and learning process and their professional development. The government should ensure that secondary schools are supplied with electricity and alternative power back up. ICT operations require constant electricity for its maximum use. Therefore, power supply should be massively increased, improved and worked upon so as to enhance the use of ICT in secondary schools. Schools should acquire up to-date ICT infrastructure that teachers and students could train and learn on. There should be ICT technician at the regional education levels to help teachers with the computer hardware or the software.

There is a need for teachers to have their personal initiatives towards the available digital learning tools so as to enhance the teaching and learning process and their professional development. More ICT teachers be employed in secondary schools and trained in ICT skills to make them effectively deliver ICT based curriculum. There should be comprehensive in-service courses. The school management should practice leadership promotion of collaboration and experimentation to teacher's dedication to student-centred learning for effective ICT transformation. There should be a good relationship between the head's level of computer competence and transformational leadership practices as this could help improve the integration of ICT into teaching and learning processes.

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