Relationship between Economic Stimulus Programme and Information Communication Technology Integration in Selected Public Secondary Schools in Kenya

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ABSTRACT: The purpose of this study was to establish the relationship between ESP and ICT Integration in selected public schools in Kenya. The study adopted descriptive research design in data collection and analysis. The study population consisted of 1, 050 Principals, 3,150 teachers and 8 officers in charge of ICT at the Ministry Headquarters. It was established that; ICT infrastructure support and ICT capacity building support had significant relationship to ICT integration. The study concluded that ESP programme led to improving ICT integration in schools, It was also found out that despite the inadequate ICT infrastructure in schools, the ESP programme has influenced acquisition of ICT infrastructure. Thirdly, despite the extent of ICT capacity building in schools being low, the ESP programme has provided the teachers and staff with the motivation to improve their own ICT capacity as evidenced by individual efforts to pursue some professional development in ICT.

KEYWORDS: Economic Stimulus Programme, Information Computer Technology, capacity building, ICT integration, Infrastructure support, unintended outcomes and outcomes

1. INTRODUCTION

Reforms in education are most times necessitated either by public demand or global trends. If performance standards are low, countries are forced to rethink their education systems. Global trends dictate that schools adopt innovations that enhance access, quality and relevance of the education system including the instructional processes. For this to happen United Nations Educational Scientific and Cultural Organization (UNESCO, 2018) guided that, a right mix of policies, technologies and capacities should be in place to guide on Integration.

Introduction of computers in classrooms was based on the realization that ICT was a potentially powerful tool for extending educational opportunities, both formal and non-formal, to previously underserved constituencies, excluded from education due to cultural or social reasons such as ethnic minorities, girls and women, persons with disabilities, and the elderly, as well as all others who for reasons of cost or because of time are excluded, (Tinio, 2002); (UNESCO., 2013).

To capitalize on the nexuses between ICT and Learning outcomes, several programmes were rolled out in Kenya, Kenya Education Network and New Education Partnership for Development (NEPAD) e-schools Programme, ICT Equipment For Schools, School Broadcasting, Development of Learning Content, ICT Equipment For Schools, Kenya ICT Trust Fund, KIE and Kenya Network Initiative For Computers in Education Programme and ESP, (MoE, 2014).

However, (Piper, 2018) in their literature review on the interaction between ICT and policy issues in the Sub-Saharan Africa and particularly in Kenya, observed that although many policies in sub-Saharan Africa see ICT as a catalyst to better learning outcomes, little is known about how ICT can improve learning outcomes in developing countries, and even less was deciphered about how research findings could and should inform ICT policies in the education sector. They attributed this to lack of a methodological rigor in research, to produce empirical evidence that illustrates whether ICT increases student learning.

Nevertheless, in Kenya ICT reforms aimed at helping achieve goals of educational programmes by enhancing basic literacy and technological literacy among learners. ICT was considered to have considerable potential to support implementation of Free Primary Education and to address challenges that were emerging such as overcrowded classrooms, high Pupil Teacher Ratios particularly in densely populated and semi-arid areas, shortage of teachers on certain subjects or areas, and relatively high cost of learning and teaching materials,(RPK,2005).

A study on Primary Math and Reading (PRIMR) by (Piper, 2018) showed that a set of investments in teacher professional development, pupil reading materials, and ongoing instructional support could improve learning outcomes in Kenya. On the other hand, the embedded PRIMR ICT study showed that ICT investments did not improve learning outcomes significantly compared to

the basic education programme. They however, observed that without research to compare various ICT investments, a stand-alone study may not be sufficient to inform policy-makers on investment decisions to invest in ICT programming that, by itself, was not more effective than focused learning interventions.

The ESP-ICT programme initiative which is the focus of the study was implemented on a large scale, targeting 47 Counties (the former 47 districts or 210 constituencies) with a focus on 7 schools per constituency. The countrywide scope had the overall objective of catalyzing ICT integration in education. It was embedded in policy directives with targets and activities that would provide a springboard from which schools will leverage to entrench ICT. Specific activities within the programme included; supply of infrastructure including ICT hardware and software and capacity building of the relevant implementers; teachers, District Education Officers, school Principals and Headquarter Officers, and (Kenya-MoE, 2014) infrastructure support aimed at enhancing access and would form a base for equipping schools in ICT, broadly classified as capacity building support, infrastructure support to enhance teachers' access to ICT. Support to schools continues to follow the ESP model to date, with considerable achievements such as penetration of internet connectivity, which is reported at 99.9%, Ministry of ICT, 2019).

Targeting of participants in the programme was purposeful, technicians, teachers, Principals and Education Officers were deemed to be leaders in the process. The importance of leadership in support of integration is emphasized by (Kidombo, 2015); (Mwawasi, 2014)and (Gakuu C.M. and Kidombo, 2010) who observed that, leadership influences the degree to which ICT integration can become embedded in educational institutions. Leadership is expected to provide focus in implementation, by drawing plans in sustainability, maintenance and renewalof ICT equipment. To enhance the implementation capacity of schools, a coordination office at the Ministry of Education headquarters was established to harmonize ICT integration in schools.

1.1 Problem Statement

The use of ICT in teaching and learning processes has benefits, it provides opportunity to emerge a cognitive resource-based mechanism in students, develop skills, lifelong learning and continuous education. It can also facilitate a more individual approach and individualized communication between teachers and students. Appropriate use of ICT leads to its integration in a learning institution. Every school that has ICT equipment, if it embraces its use, both as a medium and mode of instruction it will offer new opportunities for fresh approaches and innovative strategies to address issues of quality and relevance (Piper, 2018). For these to occur appropriate school variables that constitute availability of computers, internet, school policies and competent teachers and learners ought to be in place. Most studies enumerate infrastructure and ICT skills as a hindrance yet the Government set to address these through the ESP Programme. The Government has spent, billions of shillings investing in ICT infrastructure for schools in the last nine years, trained teachers, developed policies and digital content with the expectation that ICT integration would follow, matching ICT supply to its use in the entire nation (MoE, 2014). What then is the impact of ESP on ICT integration? The overall effectiveness of computer assisted teaching and learning in the Kenyan classroom has not been conclusively demonstrated (Monyoro, 2013), Suri (2015) and (Jabeen, 2018). What should be matched with the supply to trigger the required output? Analyzing the current state of the use of ICT answers the question on the impact of the programme. Knowledge about success or failure of the programme in the targeted institutions ought to be generated. The extent of integration by the teacher and the leaner and the impact on the school administration was established with a view to generating data that informs the process. Empirical data on the impact of ESP is lacked, the gap the study sought to fill. The study sought to fill this gap by determining the actual use of computers or the lack thereof and to examine the presumption that presence of computers in schools is an indicator to ICT integration. School administration's use of ICT will differ from school to school and establishing the extent of integration can isolate uniqueness of school and aspects within them that trigger ICT integration and provide information that can be replicated countrywide. Does supply translate to successful use or other factors determine their use? An inquiry in levels of access to ICT, teacher use will shed light on whether the intervention has an impact on the ICT integration. This evaluation may inform on how future interventions are carried out. It is for the reason that this study proposed to assess the impact of ESP on ICT integration in Public Secondary Schools with a view to determining value addition, efficiency and cost effectiveness of the ESP.

1.2 The Purpose of the Study

The purpose of this study was to establish the relationship between Economic Stimulus Programme and ICT Integration in selected public secondary schools in Kenya.

1.3 Research Objectives

The study was guided by the following objectives, to:
1. Establish the relationship between the adequacy of ICT infrastructure support and ICT integration in the selected public secondary schools under the ESP in Kenya.
2. Find out the relationship between the extent of capacity building and ICT integration in the selected public secondary schools under the ESP in Kenya.
3. Establish unintended outcomes of the ESP on ICT Integration in the selected public secondary schools under ESP in Kenya.

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1.4 Research Questions

The questions that guided the study were;

1. What is the relationship between the adequacy of ICT infrastructure support and ICT integration in the selected schools under the Economic Stimulus Programme in Kenya?
2. What is the relationship between the extent of capacity building and ICT integration in the selected schools under the Economic Stimulus Programme in Kenya?
3. What are the unintended outcomes of the Economic Stimulus Programme on ICT Integration in the selected Public secondary schools under the Economic Stimulus Programme in Kenya?

2. THEORETICAL FRAMEWORK

The theoretical framework for the study was based on the Logic Model for Assessment by (McLaughlin, 1999) to assess the programme. According to (McLaughlin, 1999), Logic Model for Assessment is a useful evaluation tool that facilitates effective programme planning, implementation and evaluation. The Model was selected because it provides a mechanism for programme evaluation that are direct with inter relationships between inputs and outputs of a programme.

The model describes logical linkages among programme resources, activities, outputs, audiences and outcomes related to a specific problem or situation, (McLaughlin, 1999). They observed that, once a programme has been described in terms of the Logic Model, critical measures of performance can be identified. The goal of ESP was to enhance the integration of ICT in education, through enhanced access to ICT, Administration and Pedagogy. The framework directly depicts inputs, outputs and outcomes as parameters for evaluation. The inputs in the programme included infrastructures support and capacity building initiatives with clear outcomes in terms of increased access and capacity of institutions to integrate ICT. They opined that the relationship between resources and results cannot happen without people while outcomes are characterized as changes or benefits resulting from activities and outputs. The model is simple and direct compared to other models as it relates to the study variables, inputs or resources were supplied through the programme to enhance ICT access while teachers, managers, technicians and officers were the people expected to produce the results both internally and externally. For them to be effective their capacities were enhanced. Therefore the framework provided fits the study design and informed its analysis.

2.1 Conceptual Framework

The Economic Stimulus Programme characterized by a supply of ICT equipment, education resources and training of teacher's and Education Managers act as an independent variable. Once introduced, the teachers were expected to be the change agents that would lead to the cascading of the programme in the entire school system. Schools were expected to gain impetus and ensure that ICT is fully entrenched in the teaching as well as administration functions. Successful implementation will impact on the overall use of ICT in the school. Pedagogy, administration, management and communication will be fully entrenched in education.
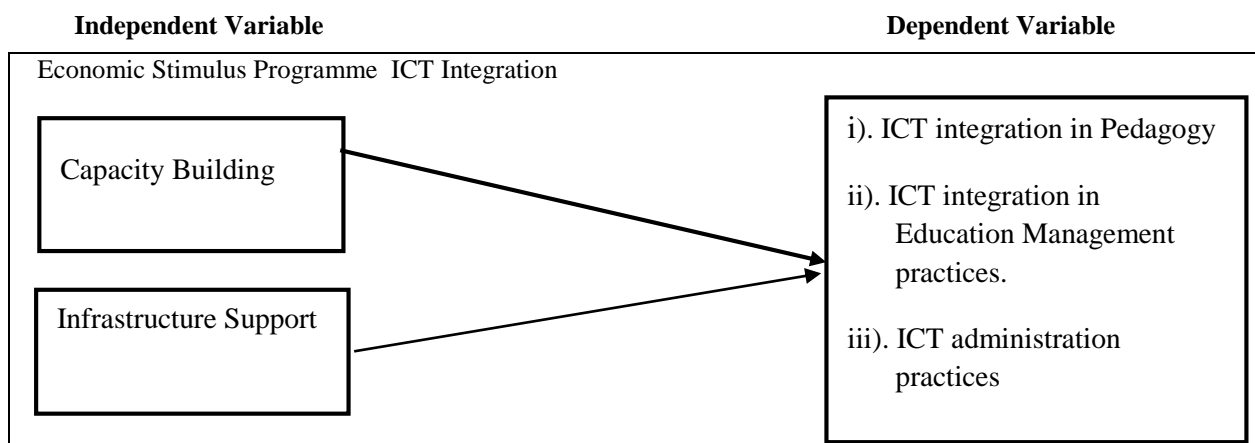

Figure 1. Conceptual framework
Source: Author (2021)

3. METHODOLOGY

The study adopted an Exploratory-Descriptive design. Descriptive survey design was appropriate for this study because the study involved the collection of quantitative and qualitative data from a number of respondents by interviewing and administering questionnaires to a sample of individuals. It involved systematic acquisition and assessment of information on variables to provide feedback using both qualitative and quantitative methods. Research variables or respondents were not manipulated in an attempt to evaluate the impact of ESP on ICT integration in schools.

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3.1 Study Population

The study population consisted of education officers, teachers and principals in 329 ESP schools in 47 counties in Kenya. The population therefore, consisted of 1050Principals, 3150 teachers and 8 officers at the Ministry of education headquarters.

3.2 Sample Size And Sampling Procedure

Multi-stage cluster proportionate sampling technique was used to select the population sample. This method helped to provide representative samples from the population since every item in the population had an equal chance of being included in the sample. (Bryman, 2016) asserts that when a study population is less than 10,000, a sample size of between, 10% to 30% is a good representation of the target population; hence, 10% is adequate for analysis. A list of beneficiary schools per cluster was provided and through a simple random sampling method, 10% of schools in each cluster were sampled totaling to a sample of 36 schools. In every school, selected the head teacher was targeted leading to a sample of 36principals. A total of 105 teachers (10%) were selected from a population of 1050. For officers, purposive sampling was used to select 8 who were instrumental in the ESP programme.

3.3 Research Instruments

The study sought to assess the relationship between ESP and ICT integration in selected public schools. A Questionnaire for teachers, Interview Schedule for principals and education officers and Document Analysis Guide were used.

To ascertain the reliability of the research instruments a pilot study was undertaken targeting 10% of the study sample. Eleven (11) public schools, eleven Principals, 30subject teachers, and 1 Ministry of Education Officer was targeted in the pilot sample. The pilot sample was not included in the actual study. Their responses were reviewed and analyzed. The Questions that were not clear were rephrased, reworded or restructured. The results from the pilot study were subjected to Cronbach Alpha test to ascertain the internal consistency or mean correlations of items to determine the questionnaire reliability. The results indicated an alpha figure of 0.7 meaning that the research instrument was reliable.

Validity was established by ensuring that items in the questionnaire cover the concepts of interest. Content validity was met by ensuring that the instruments of measurement have adequate representation of items that operationalize the concepts. To ensure construct validity, items were differentiated to ensure that the measure used fits around the concepts for which the instruments were created.

3.4 Data Collection Procedure

Approval was obtained from relevant bodies, National Council of Science Technology and Innovation, Maseno University Research Ethical Committee and Respective County educational and Administrative Offices. Data was derived from schools and education officers through, questionnaires, document analysis and interviews. Explanations were given to the respondents on the reasons why the data was being collected, how it was to be managed and applied, to ensure that respondents were willing and properly informed before the actual data collection.

3.5 Data Analysis Methods

Data collected from the study was analyzed using Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics such as frequency counts and percentages to describe summarize and deduce meaning. To predict the ordinal dependent variable (the level of ICT integration), Ordinal Regression analysis was done on the independent variable elements that had a statistically significant effect on the dependent variable. The results were presented in tables, charts and figures.

4. FINDINGS, DISCUSSIONS AND CONCLUSIONS

4.1 Adequacy of ICT Infrastructure Support and ICT Integration in the Selected Public Secondary Schools under the ESP in Kenya

The first objective of the study was to establish the relationship between the adequacy of ICT infrastructure support and ICT integration in the selected public secondary schools under the ESP in Kenya. The study found out total agreement from all the respondents on adequacy of infrastructure with a mean of between 2.81 to 3.89 and a highest standard deviation of 1.353 on all elements polled Table 4. The respondents agreed that there were inadequate computer laboratories, inadequate projector machines, printers in schools, CD ROMs and laptops. Further, it was established that learning and teaching was adversely affected by; low speed or no internet connections, number of computers available, needing repair or updates, insufficient technical support, insufficient pedagogical support for teachers, insufficient number of laptops/notebooks, lack of adequate materials for teaching, lack of pedagogical models on how to use ICT and fixed lesson time. Despite the low infrastructure ICT support provided through the ESP programme, most of the schools improved their ICT infrastructure through acquiring new computers and equipment in order to improve ICT integration in schools. The percentages of schools that had functional ICT laboratory were high (73.8%) this pointed to sustainability of the earlier initiative.

The ESP programme therefore provided the impetus for acquisition of additional ICT infrastructure. It's impact on integration can be explained on the low use of ICT in teaching, supported by low pedagogical models and poor ratios of sharing. The low support

could support administrative functions. The value of ICT infrastructure support coefficient was positive indicating that as ICT infrastructure support is increased, ICT integration will also increase.

4.1.1 ICT Infrastructure and Support Effects on ICT Integration
The study also sought to establish how ICT integration is affected by ICT infrastructure and support. This was done using a 5 point Likert scale where; (1-very high, 2-high, 3-medium, 4-low and 5-Very low) to record the extent effect. The results are presented in table 1

Table 1. Infrastructure support and ICT integration

ICT infrastructure and support	Mean	Std. Deviation
Insufficient number of computers	2.81	1.137
Insufficient number of internet connected computers	2.65	1.080
Insufficient Internet bandwidth or speed	2.66	1.292
Insufficient number of interactive whiteboards	2.75	1.298
Insufficient number of laptops/notebooks	2.55	1.272
School computers out of date and/or needing repair	2.94	1.353
Lack of adequate skills of teachers	3.89	1.091
Insufficient technical support for teachers	3.48	1.263
Insufficient pedagogical support for teachers	3.15	1.192
Lack of adequate content/material for teaching	3.36	1.295
Lack of pedagogical models on how to use ICT for learning	3.14	1.145
School time organization (fixed lesson time.)	3.09	1.171

It was established that insufficient number of computers highly (mean 2.81, SD=1.137) affecting the use of ICT in learning in a negative way. Highly affecting teaching and learning were; insufficient number of internet connected computers (mean=2.65, SD=1.08); Insufficient Internet bandwidth or speed (mean=2.66, SD=1.292); Insufficient number of interactive whiteboards (Mean=2.75, SD=1.298); Insufficient number of laptops/notebooks (mean=2.55, SD=1.272) and School computers out of date and/or needing repair (Mean=2.94, SD=1.358).

The study further established that the ICT infrastructure support negatively affecting ICT integration in teaching and learning in a medium manner was; Lack of adequate skills of teachers(3.89, SD=0.1.091); Insufficient technical support for teachers(mean=3.48,SD=1.263); Insufficient pedagogical support for teachers(mean=3.15,SD=1.192); Lack of adequate content/material for teaching (mean=3.36,SD1.295);Lack of pedagogical models on how to use ICT for learning (3.14, SD1.145)and School time organization; fixed lesson time (mean=3.09, SD=1.171).

(Sutter, 2019) reported similar assertions that provision of ICT related infrastructure in public owned educational institutions is inadequate and should be improved so as to attain a higher ICT use and integration. Globally, (Ghavifekr, 2019) reported that in countries like Singapore and Sweden, they lead in ICT integration due to the fact that they have digitized and provided a lot of ICT infrastructure in their educational institutions.

In line with these findings regarding infrastructure support, an interview with a principal who was a key informant recorded that;
 "…….due to the increased number of students, the number of students taking computer lessons has increased several folds. Also, the ICT program is gradually expanded to classroom setup to increase the use of ICT in learning. This means that the ICT infrastructure support should be increased given that what is available remains inadequate and the school's effort to improve provision of computers and internet to teachers and students is not also limited to available resources…." (Key informant interview, Principal May 2022).

4.1.2 Ordinal regression: Adequacy for Infrastructure Support in ICT and ICT Integration
The study also sought to establish the relationship between ICT integration and Infrastructure support in ICT. This was done using ordinal regression and the results presented in table 5, 6 and 7

Table 2. Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	200.052			
Final	171.413	28.639	9	.001

Link function: Logit.

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The results indicated a p-value of 0.001indicating that the model is a good fit for the data. The value of ICT infrastructure support coefficient is also positive indicating that as ICT infrastructure support is increased, ICT integration will also increase.

Table 3. Goodness of fit

	Chi-Square	df	Sig.
Pearson	108.017	117	.712
Deviance	90.550	117	.967

Link function: logit

The goodness of fit table shows that both Pearson and Deviance tests indicates that ICT infrastructure support has an influence on ICT integration in institutions

Table 7. Test of parallel lines

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis General	171.413 .000[b]	171.413	117	.061

Link function: Logit.

The test of parallel lines tests the assumptions of proportional odds which should ideally be more than 0.05. The findings indicate a p-value of 0.061 which means the main assumption of the ordinal regression is checked. The test of parallel lines tested the assumption of proportional odds which is required to be greater than 0.05. The study therefore, failed to reject the null hypothesis that the coefficients in the model are the same across the response categories indicating that the proportional odds assumption holds and our model is valid.

4.2 Relationship between the Extent of Capacity Building and ICT Integration in the Selected Public Secondary Schools under the ESP in Kenya

The second objective was to establish the relationship between the extent of capacity building and ICT integration in the selected public secondary schools under the ESP in Kenya. The study found out that capacity building was low in 76.3% of the schools.

However, teachers had undertaken to improve their ICT capacity on a self-sponsored basis. Therefore, it was established that ICT capacity building was individually motivated leading training in ICT related professional development courses such as; introductory courses on internet use and general applications; advanced courses on applications; advanced courses on internet use; equipment-specific training; courses on the pedagogical use of ICT in teaching and learning; course on multimedia; participate in online communities; discussions with other teachers ICT training provided by school and other professional development opportunities related to ICT. It was also established that in most schools teachers and ICT coordinators were used to provide ICT support. It was also established that teachers were somewhat confident of using ICT related materials and infrastructure in schools' administration and in teaching.

Table 8. Professional development

Areas	Yes	No
Introductory courses on internet use and general applications-basic word-processing, spreadsheets, presentations, databases, etc.	90%	10%
Advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment, etc.)	68.8%	31.3%
Advanced courses on internet use (creating websites/home page, video conferencing, etc.)	65%	35%
Equipment-specific training (interactive whiteboard, laptop, tablet, etc.)	75%	25%
Courses on the pedagogical use of ICT in teaching and learning Subject-specific training on learning applications (tutorials, simulations, etc.)	56.3%	43.8%
Course on multimedia (using digital video, audio equipment, etc.)	56.3%	43.8%
Participate in online communities (e.g., mailing lists, groups, blogs) for professional	65%	35%
Discussions with other teachers ICT training provided by school staff Personal learning about ICT in your own time	73.8%	26.3%
Other professional development opportunities related to ICT	52.5%	47.5%

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It was established that despite there being low extent of capacity building initiated by the schools, on average the teachers had undertaken some form of ICT professional development course on their own initiatives. This includes undertaking ;Introductory courses on internet use and general applications (90%), advanced courses on applications (advanced word-processing, complex relational databases, Virtual Learning Environment (68.8%), Advanced courses on internet use (65%), Equipment-specific training (75%), Courses on the pedagogical use of ICT in teaching and learning Subject-specific training on learning applications (56.3%), Course on multimedia (56.3%), Participate in online communities (65%).Discussions with other teachers ICT training provided by school staff Personal learning about ICT in your own time (73.8%) as well as other professional development opportunities related to ICT (52.5%).This when related to actual use in teaching which was low requires interrogation on why they were not putting the knowledge fully in use. Importance of supporting teachers to improve their expertise to integrate technology in teaching and learning cannot be overemphasized. This should be more than hurriedly convened training sessions. It should be about deepening knowledge and developing beliefs for teaching and deliberately using ICT for teaching (Hermans et al., 2008) as cited in (Kidombo, 2015).

The findings that teachers have undertaken ICT professional courses of some kind by the current study mesh well with Hussain and Suleman (2017) study. The study which sought to establish how ICT affects students performance reported that teachers who have undergone some ICT training and can use it to teach in class often improve participation of students and improves their performance. Wanzala and Nyamai (2018) when studying ICT and education in Kenya, opined that the one laptop per child in Kenya was meant to deepen the ICT integration in the education centre. However, it became clear that the teachers need coordinated professional development in ICT so as to fully realize the positive impact that the project was intended to achieve.

Finally it was established that teachers frequently used online and offline ICT related methods in schools' management, and lesson preparation. These capacity acquired however, did not propel a majority of the teachers to use ICT for teaching. The 30% use in teaching can be probably explained by the low capacity in ICT Pedagogy. Therefore, even though the extent of capacity building in schools was low, there were individual efforts by teachers to improve their ICT proficiency. This was reflected more in preparation and administration but less in actual teaching. This has had an impact on ICT use and led to increased ICT integration in the schools under the ESP program.

(Wambiri, 2017) found out that ICT infrastructure in educational institutions does not in itself ensure integration of ICT in schools and other measures like training should therefore be instituted. According to Nyag'ari (2017), use of ICT, availability of ICT equipment and their subsequent use in schools do not always translate to positive impact. This is as a result of inefficiencies, lack of interest to change things as well as operational inefficiencies. (Ngeera F. G., 2018) argues that even though there are significant deficiencies in ICT infrastructure in public schools in Kenya, this cannot solely be the reason for poor utilization of ICT in schools given that there are issues such as capacity building and goodwill from the teachers and other stakeholders.

4.2.1 Ordinal regression: Capacity building and ICT intergration
The study sought to find out the relationship between ICT capacity building and ICT integration in schools where ESP programme was implemented. The results are presented in tables 9, 10 and 11

Table 9. Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	173.251			
Final	158.252	14.999	6	.020

Link function: Logit.

The results indicated a p-value of 0.02 which is less than the study's significance level (0.05). This means the model used fits the data. The ICT capacity building coefficient has a positive value that indicates a proportional relationship where an increase in level of ICT capacity building will lead to an increase in ICT integration.

Table 10. Goodness-of-Fit

	Chi-Square	Df	Sig.
Pearson	80.434	78	.403
Deviance	77.304	78	.501

Link function: Logit.

The results from the goodness of fit table indicate that the Pearson and Deviance tests reject the null hypothesis (ICT capacity building has no influence on the ICT integration in schools where ESP programme was implemented).

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Table 11: Test of Parallel Lines

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Null Hypothesis	158.252			
General	83.181[b]	75.071[c]	78	.573

Link function: Logit.

The test of parallel lines tested the assumption of proportional odds which is required to be greater than 0.05. The study's results indicated a p-value of 0.573 which is greater than 0.05 meaning that the assumption of the ordinal regression model was checked. The study therefore, failed to reject the null hypothesis that the coefficients in the model are the same across the response categories indicating that the proportional odds assumption holds and our model is valid.

5. UNINTENDED OUTCOMES OF THE ESP ON ICT INTEGRATION IN THE SELECTED PUBLIC SECONDARY SCHOOLS UNDER ESP IN KENYA

The third objective of the study was to establish the unintended outcomes of the ESP on ICT Integration in the selected public secondary schools under ESP in Kenya. The study findings established that there were both positive and negative outcomes of the ESP on ICT integration in schools. The negative outcome was not intended. Amongst those who reported positive impact, the study sought to cross tabulate their positive impacts.40.9% of those who reported positive impact cited that it the ESP programme that made it easier to teach and learn in schools where it ICT was implemented. Also, 31 % of the teachers who reported positive impact of ESP programme cited that it helped build ICT capacity among both teachers and learners. 18% of the teachers said that the programme helped teachers and students research well while 9.8% cited that it helped improve academic performance. The results are presented in figure4.9. There have been contradicting reports from previous researchers regarding the impact of technological use in the education sector. Mutisya and Mwania (2017) for example opined that use of ICT in schools leads to efficiency in management of the schools. (Siocha, 2017) reported improved teacher student performance. The current study reports improved capacity of ICT, improved academic performance and enhancement of teaching and learning. In responding to whether ESP achieved a positive impact, a key informant's interview response was;

"…..in my honest opinion, the ESP programme has been beneficial to this school given that we can now use computers in administrative work like keeping records and use electronic registers to monitor learners when in and out of school. Teaching has also become efficient through use of computer materials for lesson planning….."(Key informant interview; principal, May 2022).

Amongst the respondents who pointed to lack of positive impact from the ESP program cited inadequate follow up, low or no internet connection, inadequate capacity building, low usage, partial enforcement of the program and inadequate implementation as the hindrances.

In gauging the impact of the ESP programme in public institutions, the study posted similar results as (Ngeera F. G., 2018). The study held that the impact of ICT use in public schools is a contentious issue given that the implementation of the same cannot be homogeneous. This is due to many variable affecting integration and use of ICT such as the required infrastructure, building capacity of both teachers and school's management; follow up from the line ministries and other stakeholders. Similarly, when it comes to integrations and use of ICT in public educational institutions in Kenya, being equipped with ICT infrastructure does not always achieve the envisioned outcomes. Sometimes even the teachers will rarely use ICT in giving lessons and will use their traditional methods of teaching according to (MoE., 2018). The results of the current study therefore relates with finding of previous researches' postulations on ICT on related variables.

6. CONCLUSIONS

First, the study concluded that there is a significant relationship between ICT infrastructure support and ICT integration in selected public secondary schools. However, there were inadequate ICT infrastructure like computer laboratories, inadequate projector machines, printers in schools, CD ROMs and laptops. The inadequate ICT infrastructure support like insufficient support materials, inadequate skills, low or no connections, insufficient pedagogical models and technical support were found to be adversely affecting ICT integration in the selected public secondary schools. The conclusion is that the ESP programme influenced acquisition of ICT infrastructure in the schools given that the schools were investing their own resources to bridge the gap created by inadequate ICT infrastructure support by Government, though their financial resources remain limited.

Secondly, the study concluded that there is a significant relationship between extent of capacity building and ICT integration in selected public secondary schools in Kenya. Despite the extent of capacity building in ICT in schools being low, the ESP programme provided teachers and staff with the motivation to improve their own ICT capacities as evidenced by individual efforts to acquire certain levels of professional development in ICT. Capacity building in ICT was therefore an individual effort given the minimum

support by school/Government. Teachers undertook some form of professional development in ICT and could therefore use ICT in their work.

Lastly, it was concluded that the ESP programme on ICT integration had both positive and negative outcomes. The positive outcomes included; making learning and teaching easier, helping conduct research, improvement in academic performance and improvement in student and teachers' ICT capacity. The Unintended outcomes leading to wastage or underutilization of resources were; inadequate usage of the ICT infrastructure, poor follow up of the ESP programme; inadequate ICT capacity in students and teachers and inadequate ESP programme enforcement. Inadequate ESP programme enforcement and redistribution of existing budget to cater for ICT integration.

7. ACKNOWLEDGEMENTS

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