



Evaluation of the Sufficiency of ICT Infrastructure and Its Use in Teaching and Learning of Geography on Learner's Academic Achievement in Public Secondary Schools in Nyamira County, Kenya

Kennedy Moga Omwoki, Ezekiel Omwenga & Dennis Mamboleo.
Kisii University, Kenya
Email: mogakennedy@yahoo.com

Abstract; *This study was an evaluation of the sufficiency of ICT infrastructure in relation to teaching and learning of geography on learners academic achievement in public secondary schools in Nyamira county, Kenya. The major issue was to evaluate the challenges on ICT infrastructure they face as teachers in their respective schools. The study used three research instruments to collect data, questionnaire, interview schedules and observation checklist, data was collected from 190 public secondary schools, and five sub – county quality and standards officers. The data was mainly collected and coding was done by using statistical package for social sciences (SPSS) version 27.0 for analyzing data. Descriptive statistics and inferential statistics were used to analyze and present data in form of tables that were integrated in the findings, the findings were highlighted and in depth analysis was done. The major barriers that face the sufficiency of infrastructure in the schools visited ranges from, administrative, finances, and inadequate wellwishers as a result there are a few gadgets and infrastructural facilities that are not enough in these schools during instructions. The study therefore recommended that the administrators, financiers and well wishers to assist in improving the schools infrastructural facilities in order to improve ICT usage during teaching and learning process for our schools to achieve learner centered strategies in teaching geography in Nyamira county.*

Keywords: *Evaluation, Learners, sufficiency, infrastructure, geography, teaching and learning.*

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1. Introduction

Information communication technology (ICT) in education has been embraced by many developed countries of the world since early 1980's where it has been used in all levels of teaching and learning process unlike in developing countries like Kenya which is still struggling with the slow pace in the implementation of ICT in instructions. In Kenya the ministry of Education, science and technology on the ICT policy has taken an experimental study but in small scale in its implementation. The main objective of ICT policy in Kenya is to promote, deploy and give knowledge and skills to the younger generation, ICT is the key drive to our economic social and political development as it's noted by Kanjam(2020) and supported by Kafyulilo and Keengwe(2014).

Further according to Henderson(2020) has stated that the major problem of sufficiency of ICT infrastructure has undermined the usage of ICT in the teaching and learning of geography in public secondary schools of Nyamira county for a long time, so raising the concern to stakeholders and administrators. Minocha, Tilling & Todur(2018) have observed on the importance of infrastructure of ICT for instructions, this is a major reason why the performance of geography is still very low. It is unfortunate that some research has been done in other areas but not much on geography in public secondary schools as it was emphasized by Chege (2014). The ministry of education has emphasized on the usage of ICT in instructions of all subjects in our schools but it has not availed the gadgets and ICT needed infrastructure on the implementation of ICT in classroom teaching and learning. The ministry of education has supported the implementation by using administrators, financiers and well wishers in order to operationalize our curriculum on ICT usage, on other hand sufficiency of ICT infrastructure in public secondary schools in Nyamira county needs to be addressed their challenges include, teachers attitudes, competency of technical staff, learners entry behavior and availability of ICT gadgets. These situations made the researcher to do investigation on the effects of sufficiency of ICT infrastructure since these research objective affects the performance of geography in public secondary schools in Nyamira county Kenya.

Many scholars have done research in the usage of ICT in teaching and learning of geography and other social sciences in other parts of Kenya, according to John, David & Alex (2015) asserted the challenges of implementing E-learning in Kenya, where they observed and recommended that the challenges that included administrative, teacher barriers and lack of Internet in the schools should be solved. According to Musumba (2019) noted that the problems facing the

integration of ICT in Matungu sub county such as lack of training on ICT and fear of teachers being replaced by machines in teaching can be solved when all stakeholders are involved. According to Otieno (2022) several factors are influencing integration of ICT in teaching of geography in secondary schools in Rachounyo-sub county, Homa-Bay county many scholars through their recommendations on the benefits of ICT in the teaching and learning of geography in their respective counties so much has not been addressed adequately in teaching and learning of geography on learners academic achievement, so in these regard I have now decided to take this study in Nyamira County Kenya in order to fill the research gap.

2. Literature Review

According to De Guzman, Oaguer & Novera (2017) they gave the meaning of sufficiency of ICT infrastructure as the availability of ICT rooms and the gadgets used for instruction, whether they are readily in school when need arises for use these was supported by Walshe (2017) in his findings on developing trainee teacher practice with geographical information systems, according to UNESCO (2015) where more as been explained on the importance of ICT in teaching and learning process in USA and other parts of the world on quality education for all.

According to Gharifekr & Athirah (2015) on their findings on research on teaching and learning with technology in Malaysia and the benefits of integrating of ICT in teaching & learning in their institutions, the benefits of ICT in teaching and learning has been realized. The use of ICT is ultimately a question of whether the value added of ICT use offsets the cost, relative to the cost of alternatives, and whether ICT-based learning is the most effective strategy for achieving the desired educational goals. According to Quan, Martin and Schteurs (2016) they have noted that over the years since the start of using ICT in teaching in developed countries, the use of ICT in developing countries is still in slow pace, in their research findings on interviews with digital seniors, ICT, use in the context of every day life. in their research of science for everyone; visions for near-future technology, they argued that without proper allocation of financial resources the attainment of the usage of ICT in teaching and learning is not possible hence ICT integration will be a big challenge, their second book (2017) where they have given a detailed survey in the utilization of ICT in Philippines Pubaz high schools, where he asserted that finance make the users of ICT to face several challenges funds becomes a corner stone of the ICT implementation in their colleges, because money is used to construct ICT rooms and other relevant ICT equipment. UNESCO (2018) observed the importance of using ICT in institution where they

indicated that the methods of instruction which became more efficient and gives better results, these as been done in developed countries such as U.SA also observed by Scherer,saddie &Tondeur (2019) on the technology acceptance model(TAM) ,A meta-analytic structural equation model approach explaining teachers adoption of digital technology in Education in their world ,it has been proven to be working in the rightful way, in his research findings on the changing media environment of American classroom, here he asserted that the usage drastically improved performance of all subjects when ICT was used in instruction in their schools .According to Kafyulilo& Keengwe (2014) ,on teachers perspective on their use of ICT in teaching and learning where they have given the importance of using ICT in instruction that enhances effective teaching with technology in higher Education they emphasized that the only way ability instruction can be done is by the use of ICT, then making learning and teaching more comfortable and can accommodate our quality living . Becker (2014) on pedagogical motivations for student computer use that leads to student engagement in learning institutions globally, the scholar stated the importance of ability of information in the learning process, in his book blended learning, teachers plus ICT entails success, he clearly stated the impact of using ability instruction and can result into positive results.

According to Mbatha (2015) in his findings on teachers ICT integration challenges in south Africa he has emphasized that the implementation of ICT will be realized after there is enough financial funding, there is no University which is self-sustaining, the funding by the government has to be properly arranged and given enough budgetary allocation, in his book he has given finance as the major problem in the construction of infrastructure in the usage of ICT in teaching Geography in higher learning institution

Vincent and mudobi (2022) in their research on understanding the sources, applications, and advancement of information communication and technology (ICT) in Zambia, the scholar noted that the first place is whether there are appropriate rooms or buildings available to house the technology. He viewed the issue of insufficient ICT rooms as a major problem facing the usage in instructions. The provision of electricity and telephone service is another fundamental prerequisite. Large portions of developing nations still lack access to electricity, and the nearest phone is located kilometers away. Despite the fact that this is currently a highly expensive strategy, other developing nations still have very weak telecommunications infrastructure. Finally, policymakers should consider how commonplace various ICTs are in the nation as a whole and throughout the educational system at all levels. For instance, Kabwika (2019) in

his research findings on adoption of information and communication technology in improving teaching and learning in the DRC, states that access to ICT in schools and reasonably priced internet services are fundamental requirements for computer-based or online teaching and learning .Many research has been done in Kenya, Otieno (2022), on factors influencing integration of ICT in teaching geography and Chege (2014) on factors influencing teachers' readiness to use ICT in teaching in schools in Kenya these scholars have indicated the challenges and benefits of ICT in instructions in teaching and learning process.

3. Methodology

3.1 Research Design

The study used a Descriptive Research Design to get information on the influence of the sufficiency of ICT infrastructure in the teaching and learning of geography on learners academic achievement in public secondary schools in Nyamira county –Kenya. Descriptive analysis was done where School principals ,geography teachers ,geography students and sub-county quality and standards officers all responded to the items on a Likert scale and observation checklists that focused on various ICT challenges that they face while integrating ICT in teaching and learning of geography as Noted by Best & Khan (2015).

3.2 Target Population

The study population comprised of School Principals, geography teachers, geography students of the 190 public secondary schools in Nyamira county and five education officers from Quality Assurance offices.

3.3 Sample and Sampling Technique

A sample of 57 public secondary schools in Nyamira county out of 190 public secondary schools were used in this study and five educational officers as recommended by cresswell & clark (2017). .The schools were stratified into four categories as National schools, E-xtra county schools ,county schools, and sub-county schools ,the required Number of schools was chosen using random sampling for selecting number of schools at 30% from each category ,proportionate sampling was used to select geography teachers and geography

students because the numbers was not uniform in all schools and purposive sampling was used for all education officers who were only five as stated by Etikan & Bala Clark (2017), were they noted that the goal of this sampling procedure is to have the sample resemble the population as much as possible.

4. Results and Discussion

The major aim of this study was to establish the sufficiency of infrastructure in the usage of ICT in relation to learners academic achievement in public secondary schools in Nyamira county –Kenya. The sufficiency of infrastructure in the usage of ICT in learners academic achievement is very necessary in meeting the

Although 498 questionnaires and observation checklist which were distributed all were responded to by 494 on the study translating to 99.2% which was seen as excellent and could give reliable results as asserted by Kothari(2017) .

objectives of our educational curriculum as it is being emphasized by the Kenya institute of curriculum development ,the institute guides the process in schools .The usage of ICT in schools is enhanced by the presence of infrastructural development in schools ,this is being asserted in his book (Mbatha, 2015). In order to realize these objectives the respondents were requested to rank the likert scale in order for the study to achieve its required information as analyzed in table 1 below ,

Table 1: Responses on Sufficiency of ICT Infrastructure in Our Schools

Statement	SD		D		N		A		SA	
	f	%	f	%	f	%	f	%	f	%
Is there any shortage of funds to buy ICT gadgets by the school?	10	11.49	4	4.59	5	5.75	60	68.97	8	9.20
Is there good will from administration for the buying and usage of ICT in teaching?	15	17.24	62	71.26	3	3.45	4	4.59	3	3.45
Is there low level of ICT knowledge among your staff?	5	5.75	5	5.75	5	5.75	60	68.97	12	13.80
Are geography teachers having poor attitude to usage of ICT in teaching?	10	11.59	49	56.32	9	10.34	7	8.04	12	13.80
Are the ICT gadgets enough for usage when teaching geography?	9	10.34	61	70.11	4	4.59	6	6.90	7	8.04
Are the ICT gadgets modern?	11	12.64	59	67.81	6	6.90	7	8.04	4	4.59
Do you desire to use ICT in teaching of geography?	6	6.90	5	5.75	4	4.59	60	68.97	12	13.80

Source; Field Data 2023

In the table above the following findings were shown after the study that 10 (11.59%) of the respondents strongly disagreed with the statement that is there any shortage of funds to buy ICT gadgets by the schools, 4(4.59%) of the respondents disagreed with the table above , 5(5.75%) of the respondents were neutral on the statement , 60(68.97%) of the respondents stated that they strongly agreed that the schools had a shortage of funds that can be used to buy ICT gadgets , while 8(9.20%) of the respondents agreed that the statement was true that schools lacks adequate funds to support ICT infrastructure in their schools. In conclusion it indicated that the majority of respondents were at 68.97% that

geography teachers agreed that schools had finances to support the purchase of ICT gadgets while 4.59% of the respondents were the minority who argued that there was shortage of funds to support the purchase of ICT gadgets to be used in schools while they are giving instructions in class when teaching geography as it was noted by Ras, Chin & Lim(2016) .

In the second statement were the respondents were required to answer an inquiry on the statement about the goodwill from administration for buying and usage of ICT in teaching ,the following findings were indicated as below 15(17.24%) of

the respondents strongly disagreed with the statement ,62(71.30%) of the respondents disagreed with the statement ,3(3.45%) of the respondents were neutral who never took sides from the statement ,4(5.60%) of the respondents strongly agreed with the statement that administrators have goodwill to the usage of ICT in teaching and learning of geography and they even support that administration readily supports the purchase of ICT gadgets to their schools while 3(3.45%) of the respondents agreed with the statement . In the findings it indicates that the majority of respondents were at 71.30% who disagreed with the statement that there is goodwill on the purchase and usage of ICT in schools supported by administration while 3.45% of the respondents were the minority who agreed that teachers gets support from the administration during the purchase and its usage during instructions in class when teaching geography as also argued by Rabah(2015) .

In the third statement where the inquiry was on the level of ICT knowledge amongst the teaching staff ,the responses were as follows 5(5.75%) of the respondents strongly disagreed with the statement that teachers have knowledge of ICT usage in class while teaching ,5(5.75%) of the respondents also disagreed with the statement on the level of ICT knowledge ,5(5.75%) of the respondents were undecided on the answer to give on the statement ,60(68.97%) of the respondents strongly agreed that the statement was true because most teachers cannot handle ICT lesson in class minus assistance of experts in ICT while 12(13.80%) of the respondents also agreed that the level of ICT knowledge in schools is too low that even some students are more informed on the usage of ICT in teaching than some teachers who were not trained from their respective universities .According to the findings in the conclusion was that most teachers agreed that there are low levels of ICT knowledge in their schools, the teachers who agreed were a majority of 68.97% while the minority was at 5.75% who disagreed with the statement on the level of ICT knowledge .In essence most teachers in our schools have low knowledge because from their respective colleges they were only taught computers on theoretical aspect only and most of them have not been taken for in service training or ICT capacity building by their respective schools, Ramorola (2014) also recommended on these findings.

In the fourth statement where they wanted to inquire on geography teachers attitude to use ICT in teaching ,the following findings were shown as below 10(11.50%) of the respondents strongly disagreed with the statement that does teachers have poor attitudes on ICT usage while teaching geography in class,49(56.32%) of respondents disagreed with the statement that teachers have poor attitude to usage of ICT ,9(10.34%) of the respondents were neutral to the statement they never

indicated nor decided on teachers attitude on ICT usage ,7(8.04%) of the respondents strongly agreed that the teachers have poor attitude to usage of ICT in teaching, while 12(13.80%) of the respondents also agreed with statement that there is poor attitude of geography teachers to usage of ICT when giving instructions in class. In conclusion the majority of respondents were at 52.32% who disagreed with the statement that geography teachers have poor attitude to ICT when used for teaching while 8.04% of the respondents agreed that the attitude of teachers of geography is poor when instructed to use ICT in teaching and learning in our schools in Nyamira county as supported by Rana ,Greenwood ,Fox ,Turnball &Wise (2018).

In the fifth statement where the respondents were to respond to the statement which wanted to inquire whether schools have enough gadgets that are used for instruction in respective schools ,the following are the findings of the inquiry 9(10.34%)of the respondents strongly disagreed with the statement,61(70.11%) of the respondents also disagreed with the statement,4(4.60%) of the respondents were neutral to the statement of inquiry ,6(6.90%) of the respondents strongly agreed that the statement was true by indicating that the schools have enough ICT gadgets in their schools that can be used while 7(8.04) of the respondents also agreed that the statement was correct that schools have enough ICT gadgets. In conclusion the findings shows that the majority of 70.11% of the respondents disagreed with the statement that there are enough ICT gadgets in our schools, when they are needed for use when teaching geography while the minority was at 4.60% of the respondents were neutral they never supported the statement which was used for inquiry as being supported by Chirwa & Mubita (2021).

In the sixth statement the respondents were asked whether there are modern gadgets in their ICT rooms that can be used for instruction ,after the inquiry the following findings were indicated 11(12.64%) of the respondents strongly agreed that the ICT centers have modern gadgets ,59(67.81%) of respondents also disagreed with the statement that there are no modern ICT gadgets in the ICT centers ,6(6.90%) of the respondents were neutral and undecided on the answer to the inquiry,7(8.04%) of the respondents strongly agreed that the ICT centers have modern gadgets that are used in teaching and learning of geography in our institutions while 4(5.60%) of the respondents agreed that most of our schools ICT centers are equipped with modern ICT gadgets that are used for teaching geography in our schools. In conclusion the majority of the respondents were at 67.81% of the respondents who disagreed with the statement that our schools do not have enough and modern gadgets that can be used for teaching while 5.60% of the respondents were the minority who agreed with the statement that our

schools have enough and modern gadgets for ICT usage in the teaching and learning of geography these was asserted by the scholars ,Yong, Gates &Harrison (2016).In the last statement the inquiry was done on the desire of teachers to use ICT for teaching geography ,the following findings were indicated ,7(6.90%) of the respondents strongly disagreed with the statement ,5(5.75%) of the respondents disagreed with the statement ,4(4.60%) of the respondents were neutral on the statement ,60(68.97%) of the respondents strongly agreed with the statement that teachers have a desire of using ICT in teaching of geography while 12(13.80%) of the respondents also agreed with the statement that learners can be

taught by use of ICT gadgets. In conclusion the findings indicated that there majority of respondents were at 68.97% who agreed with the statement that teachers have a desire of using ICT gadgets in teaching and learning of geography while the minority was at 4.60% who disagreed with the statement on the desire of geography teachers in the usage of ICT for instruction .In brief most respondents have a great desire to have enough skills and knowledge so that they can apply the skills in teaching and learning of geography in order to improve geography performance and its increase of student enrolment as supported by Rambonsek,et all(2014).

Table 2: Sufficiency of ICT Infrastructure

Indicator	SD	D	UD	A	SA	
Can ICT usage improve performance of geography in your school?	7	12.286	10.534	7.02	26 45.61	14 24.60
How often is ICT used in teaching of geography?	12	21.0528	49.123	5.26	7 12.287	12.28
Do you allow all your teachers to use ICT in teaching?	11	19.3029	50.884	7.02	6 10.537	12.28
Do you have ICT center?	10	17.5430	52.633	5.26	8 14.036	10.53
Is ICT the best media for teaching?	6	10.536	10.538	14.0332	56.145	8.77
Can you agree that ICT can improve enrolment in geography in your school?	4	7.02	3 5.26	8 14.0312	21.0530	52.63
Do you budget for ICT purchase in your school?	13	22.8027	43.372	3.50	7 12.288	14.03

Source; Field Data 2023

From the above tableS on the sufficiency of ICT infrastructure the following were the findings of the study as indicated below on the first statement which wanted to inquire on the usage of ICT and improvement of geography performance in the schools the findings are as below ,7 (12.28%) of the respondents strongly disagreed with the statement, 6(10.35%) of the respondents also disagreed with the statement, 4(7.02%) of the respondents were neutral who never supported the statement ,26(45.61%) of the respondents strongly agreed that the use of ICT in teaching and learning of geography totally improves its performance and increases students enrollment in geography in the visited schools for data

collection while 14(24.60%) of the respondents agreed with the statement that the use of ICT in the teaching of geography can improve its performance at KCSE National level. The findings indicated that the majority of respondents was at 45.61% who agreed that ICT usage in geography instructions can bring a good performance in the subject when well used in teaching while 7.02% of the respondents were neutral to the statement, according to Rabah (2015), in his research on development of ICT in developed countries ,ICT development and usage as highly influenced the performance of geography ,because teachers are trained on its usage through pre-service ,in-service and seminars by building their

ICT capacities that enables one to be competent on its usage and gives learners a chance to participate in ICT integration and make geography lesson to be more learner centered for students as recommended by Ndiku ,Ngussa &Mbuti (2020).

The second item on the statement which wanted to inquire on the usage of ICT in teaching geography often , the findings of the inquiry were as below 12(21.05%) of the respondents strongly disagreed with the statement,28(49.12%) of the respondents disagreed with the statement that ICT is often used in teaching and learning of geography ,3(5.26%) of the respondents were neutral with the statement ,7(12.28%) of the respondents strongly agreed with the statement that ICT is oftenly used in the teaching of geography while 7(12.28%) of the respondents agreed that the use of ICT in teaching and learning of geography in our schools in Nyamira county is oftenly done .The findings of this study indicated that the majority of respondents were at 49.12% who disagreed with the statement that the use of ICT in teaching of geography as a subject is oftenly done while the minority of the respondents were at 5.26% who were neutral with the statement. In enhancing ICT usage in our secondary schools in our county more trainings must be done ,according to the findings of Bala & Atikan, (2019) ,they stated that ICT can be used step by step from the lowest level of learning institutions to higher levels of learning systematically to enhance better results of all subjects which are taught in our institutions of learning in order to reach the level of ICT usage in instruction in developed countries were everything academic is done by use of ICT technologies these was also asserted by Arya, Christ and Wu (2020).

In the third statement which inquired whether all teachers teach their subjects by applying ICT gadgets, the following responses were indicated 11(19.30%) of the respondents strongly disagreed with the statement,29(50.88%) of the respondents disagreed with the statement that all teachers use ICT in teaching all subjects in their respective schools when giving instructions,4(7.02%) of the respondents were neutral on the statement on the usage of ICT in giving instructions to all subjects in the schools.,6(10.53%) of the statement the respondents strongly agreed with the statement ,while 7(12.28%) of respondents agreed with the statement on the usage of ITC in our schools. In conclusion the findings showed that the majority of the respondents were at 50.88% who disagreed with the statement that ICT is used in teaching all subjects in their secondary schools while the minority of the respondents were at 7.02% who were neutral to the statement on the usage of ICT in teaching of all subjects in the schools as argued by Arkorful,Barfi &Aboagye (2021).The fourth statement inquired about the availability of ICT centers in the schools ,the following

findings were shown by the respondents 10(17.54%) of our respondents strongly disagreed with the statement that the schools do not have ICT centers ,30(52.63%) of the respondents also disagreed with the statement on the establishment of ICT centers in our schools 3(5.26%) of respondents were neutral they never supported any part of the statement ,8(14.03%) of the respondents strongly agreed with the statement while 6(10.53%) of the respondents agreed with the statement that the ICT centers are established in their schools. From the above findings the results indicated that 52.63% of the respondents were the majority who stated that there are no established ICT centers in their schools while the minority of the respondents were neutral of the statement .In most schools in Nyamira county the establishment of ICT centers was done by wellwishers and Non - governmental institutions and are found in very few schools. Some schools have small rooms where they keep a few gadgets they have and that are in use while others have some broken gadgets that are not in use in the teaching and learning of any subject these has been asserted by Addam (2014).

The fifth statement on the item which stated that is ICT the best media for teaching ,the following findings are shown below ,6(10.53%) of the respondents strongly disagreed with the statement,6(10.63%) of the respondents disagreed with the statement ,8(14.03%) of the respondents were neutral never supported any side of the scale ,32(56.14%) of the respondents strongly agreed with the statement ,while 5(8.77%) of the respondents agreed with the statement that ICT is the best media that is used for teaching and learning of geography when giving instructions . The findings indicated that most teachers agreed that ICT is the best media that is used for teaching by a majority of 56.14% of the respondents supporting the statement while 10.53% of the respondents also disagreed with the statement and they were the minority of teachers .In most cases ICT is the preferred method of instruction in our schools where most teachers try to teach using ICT in order to make teaching of geography to be learner centered hence giving learners an opportunity to exploit their know how of ICT usage as being recommended by Eickelmann &Vennemann (2017)

The sixth statement which indicated on the inquiry on whether ICT can improve enrolment of geography in schools ,after usage of ICT in teaching of geography the following findings were shown as below 4(7.02%) of the respondents strongly disagreed with the statement ,3(5.26%) of the respondents disagreed with the statement whether ICT can improve the enrolment of geography as a subject when well used for instruction ,8(14.03%) of respondents were undecided on the statement 12(21.05%) of the respondents strongly agreed with the statement while 30(52.63%) of the respondents agreed with the statement that the use of

ICT in teaching and learning of geography can improve its performance and as a result the enrolment of more students in geography can occur gradually. The findings of these statement indicated that 52.63% of the respondents supports the statement as the majority while the minority of the respondents was at 5.26% of which the respondents disagreed with the statement that ICT can improve enrolment of geography in our schools. Most of our schools do not have ICT centers and there are no gadgets to use in improving performance as it was concurred by Enus, Nkum, Ninsin, Diabor & Korsah (2018).

The seventh statement on the budget for ICT purchase in schools, the following findings of the statement is indicated as below 13(22.80%) of the respondents strongly disagreed with the statement, 27(43.37%) of the respondents also disagreed with the statement, 2(3.50%) of the respondents were neutral when giving their responses, 7(12.28%) of the respondents strongly agreed with the statement while 8(14.03%) of the respondents agreed with the statement that budgeting is done for purchase of ICT gadgets. In conclusion the majority of respondents was at 43.37% who disagreed with the statement on budgeting of ICT gadgets in our schools while the minority was at 3.50% of the respondents who agreed that there are budgets in schools for purchase of ICT gadgets to the schools for use during pedagogical instruction. In essence most schools do the purchase of other consumables to their schools and they do not have any finance they can allocate for the ICT gadgets even though they don't know their influence in performance of subjects in schools these was agreed by Kent & Philips (2019).

In the questionnaire of geography teachers the inquiry was being done on whether the your school have an ICT center the response was indicated as below 67(77.01%) of the respondents said NO while 20 (22.98%) of the respondents from teachers said YES, in the findings it showed that the majority of teachers of geography as respondents were at 77.01% while the minority of respondents were at 22.98% of, hence showing that most of our schools in Nyamira county do not have ICT learning centers as supported by Langat (2020).

On the observation checklist the findings indicated as shown, in the first observation the gadget shown was a lap top where the respondents gave the results, 23(40.35%) of the total respondents indicated that the schools have the gadgets while 34(59.40%), of the respondents indicated that the schools visited never had any school laptop so the majority of respondents indicated that schools do not have school laptops that can be used for teaching and learning in classroom to give instructions.

In the second gadget of smartphones 47(82.45%) of the respondents indicated that

they are available in their schools while 10(7.54%) of the respondents disagreed with the findings that there are smartphones in their schools that are used for teaching and learning of geography.

In the third gadget of video cameras 2 (3,51%) of the respondents agreed that video cameras are in their schools that are used for earning while 55(96.49%) ,of the respondents disagreed with the findings that the gadget is not used for teaching and learning in their schools .

The fourth gadget on projectors 5 (8.79%) of the respondents indicated that it is used for instruction in school while 52((1.22%) of respondents showed that projectors are not used in teaching and learning process in their schools during instructions

The fifty gadget printers are used in their schools by respondents it indicated that 42(73.69%) while 15(26.32%) of the respondents indicated that they have never seen a printer in their schools.

The sixty gadget of Electricity indicates that almost all schools are at 100% in the supply from National grid. Finally, on computer rooms only 6(10.53%), of the schools have computer rooms that are constructed by NGO'S and 51(89.47%) of the total respondents indicated that most schools do not have computer rooms.

The rate of usage of internet in schools is that the use of internet in full was at 3(5.26%) connected when needed for use is at 7(12.30), No connection at all 30(52.63%) of the schools and only in administrative offices is at 17(29.82%). From the above indicates that internet only benefits administrative work not for teaching and learning process.

The results of interviewing schedule on sufficiency of infrastructure and availability of ICT gadgets were analyzed, coded and the themes which emerged were recorded and compared with the qualitative results as shown, school educational officers focus more on the quantity of course content and student test scores than on ICT usage, lack of appropriate administrative support for the effective use of ICT, administrators are mandated to improve examination results which shifts the focus away from using ICT to engage students in higher order thinking activities, lack of appropriate course content and instructional programs and lack of appropriate hardware software and learning ICT materials. In conclusion the study concurred with the results of the themes respondent by the respondents in the interviewing schedule but the researcher gave some strategies on how ICT usage should be improved for teaching and learning of geography for

better results, to update teachers skills and knowledge and offer technical support when needed by the teaching fraternity, support partnerships and help teachers share effective technology practices and experiences, provide workshops that allow teachers to reflect upon effective strategies for technology integration into instruction and unveil issues that are central to understanding the process of technology integration into instruction, offer opportunities to virtually observe teachers who use technology while giving instructions in classroom, use of ICT enhanced materials from K I C D, provide enough freedom for teachers in selecting and covering curriculum materials ,provide ,effective ,timely, and continues training for teachers to improve ICT skills and manage a technology rich classroom when giving instructions, encourage positive attitudes about the benefits of integrating ICT into instructions and provide adequate technical support for their personnel.

5. Conclusions and Recommendations.

5.1 conclusions

The following conclusions were drawn from the findings in this study ;

1. School administrators as well as the ministry of Education science and technology bear a big blame on the sufficiency of ICT infrastructure in public secondary schools in Nyamira county Kenya
2. Most administrators tend to purchase the neediest items to the school giving ICT facilities a second priority after consumables.
3. There was a tendency by most stakeholders not to take the seriousness of ICT infrastructure in the learning institutions.
4. The evaluation shows that most public secondary schools in Nyamira county do not have the sufficiency of ICT infrastructural facilities.

5.2 Recommendations

The study made the following recommendations

The principals in public secondary schools should,

1. Conducting seminars and workshops for the management on the importance of ICT in teaching and learning centers.
2. 2) Principals should work on strategies on how to build ICT centers in their respective schools to be used in teaching and learning process.

3. Principals and stakeholders be role models in the implementation of ICT through the construction and availing the required facilities for better results in geography .

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