LEADERSHIP CHALLENGES FACED BY SCHOOL PRINCIPALS WHEN IMPLEMENTING ICT-BASED CURRICULUM AND INSTRUCTIONS IN SECONDARY SCHOOLS IN ELGEYO MARAKWET COUNTY

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BED ARTS (MASENO UNIVERSITY)

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DEDICATION

To my parents Pauline Sesat and George Chemenengai, my husband Jack, my children; Jepchumba, Rutto and Jepkong'a. be blessed.

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ABSTRACT

Implementation of ICT based curriculum that enhance teaching and learning using technology across all subject disciplines in secondary schools remain a challenge. Although the government has put measures, initiatives and investments to improve this excersie, most secondary schools continue to use traditional methods of teaching, which are against modern teaching and learning practices. Due to these backdrops, the purpose of this study was to investigate the challenges that secondary school principals face in implementing ICT-based curriculum and instruction in Elgeyo Marakwet County in Kenya. The specific objectives included: to establish the education technology leadership challenges school principals experience when implementing ICT based curriculum in secondary schools in Elgeyo Marakwet County; to determine the kind of transformational leadership challenges facing school principals when implementing ICT based curriculum in secondary schools in Elgeyo Marakwet County; to examine nature of Instructional Improvement Tech Leadership challenges school principals experience when implementing ICT based curriculum in secondary schools in Elgeyo Marakwet County and to establish the ICT change agility leadership challenges school principals face when implementing ICT based in secondary schools in Elgeyo Marakwet County. The study was guided by Open System Systems, Technology Acceptance Model and the Model of IT implementation process theories. An inductive research approach of quantitative and qualitative methods with a descriptive survey design was used. The target population was secondaery school principals from all 74 secondary schools in Elgeyo Marakwet County. The units of analysis were 74 secondary schools leading to a target population of 74 Principals. This was reduced to 63 secondary schools that allowed a reasonable number of schools in a qualitative study. Hence a sample size of 63 of accessible population was selected. The accessible study population of 63 secondary school Principals was adopted as the accessible population using Krejcie and Morgan (1970, Appendix VI) that gave a sample size of 63 participants. Stratified random sampling techniques to select secondary schools from which 63 principals were derived. The Likert Scale Questionnaire of secondary school principals was used in collecting data. Pilot study findings indicated feasibility of the actual study with changes and close monitoring, validity was high on existing theory and knowledge, measure of how measurement covers all aspects of the concept being measured nd how the result of the measures used in this study corresponded to other valid measures of the same concept. The reliability was confirmed on the consistency of results across time, across different observers, and across parts of the test itself. The data collected was organized and classified in particular order on completed questionnaires and incomplete questionnaires. The findings indicted there were leadership challenges experienced by secondary school principals in the implementation of ICT based curriculum in secondary schools in Elgeyo Marakwet Count. Thes leadership challenges included educational technology leadership, transformational leadership, and instructional improvement leadership and ICT change agility leadership. It was found out that school leadership has a key role on ICT implementation in teaching and learning however, the level of ICT based curriculum implementation is inadequate or lacking altogether. It was therefore concluded that lack of educational technology, transformational, instructional and ICT change agility leaderships that provide radmaps for the ICT based curriculum implementation in secondary schools was inadequate. It was therefore recommended that secondary school leaders must develop and practice adequately and effectively educational technology leadership, transformational leadership, instructional leadership and ICT change agility leadership to create environment that support implementation of ICT based curriculum in secondary schools.

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LIST OF ABBREVIATIONS AND ACRONYMS

AVA	Audio Visual Aids
CD	Compact Disc
CEO	Chief Executive Officer
CT	Communication Technology
ICT	Information Communication and Technology
ICTEA	Information Communications Technology in Educational Administration
IT	Information Technology
OPAC	Online Public Access Catalogue
ICK	Instructional Content Knowledge
ROMs	Read-Only Memory
SMTs	School Management Teams
SPSS	Statistical Package for Social Sciences
TPACK	Technology, Pedagogy and Content Knowledge
UNESCO	United Nations Educational, Scientific and Cultural Organization
WAP	Wireless Application Protocols

CHAPTER ONE

INTRODUCTION

1.1 Background and Introduction to the Study

Globally, ICT-Based Curriculum implementation across all functions of a school teaching and learning system has been the subject of numerous studies on systemic change (Ghavifekr & Rosdy, 2015; Kidombo, Gakuu et al. 2013; Mathipa & Mukhari, 2014; Muriithi, 2017 and Sutter & Kihara, 2019). Many schools leaderships across USA, Europe, Asia, Middle East and Africa, Kenya included, are tensed, confused and even hesitant about the application of Information Communcation and technology (ICT). The creation and use of smart school-classrooms, applying technology across all subjects transformed or blended physical classroom into a virtual or online form, guided process of exchange of ideas and information to reliable ICT based teaching; learning and evaluation remain a challenge in most secondary schools. Also, arriving at a desired education system path with maintained relevance of transferring secondary level teaching and learning content is still hard task for most schools. But with these shortfalls, educators as a community are still responsible to prepare students for a future that includes 21st century technology readiness skills.

Studies conducted in North America (Mathipa & Mukhari, 2014, Oliveira & Martins, 2011, Hennessy, Onguko, Harrison et. al., 2010) reveals existence of more interest and investments or provision of ICT resources in the classrooms. However, (Ghavifekr & Rosdy, 2015; Sutter & Kihara, 2019; Stephen, 2014) reveal that investment and provision of ICT resources; equipment and materials in classrooms have not translated to improved

learner performance, may be due to poor implementation. UNESCO Report (2014) indicated that one laptop to one pupil project of primary schools in USA, also has not shown any significant impact on pupils educational achievements. The impact of one laptop to one pupil project in the primary schools (Niamh, 2010) has not been quantified since there is no improvement in writing and reading skills or the decrease of these skills. At the same time, more study findings reveal existence of gaps and unanticipated outcome of ICT from its implementation (Zaman et. al., 2011 and Mathipa & Mukhari, 2014 and Al Mofarreh, 2016).

In UK, education stakeholders developed national guidelines aimed at increasing ICT practices for instructions in educational institutions. However, (Bank, 1999) argues that despite these great policies, the incorporation of ICT in classrooms has been difficult for the education systems of all regions. Hence working towards readiness to put up with the ICT needs and demands of this century remains mere dream. Although ICT is recognized as fundamental to educational transformation, yet the positive outcomes of technological development (Mathipa & Mukhari, 2014 and Oliveira & Martins, 2011) in learning institutions are not universally, equally or automatically experienced (Kozma 2002). The outcomes and impacts of using ICT in education vary across countries, and not assured although ICT supporters portray a picture of an all education problem solver model. However, there are many recognised benefits of using information communication and technology in education. But inadequate or poor implementation of ICT-Based Curriculum denies learning institutions the good things anticipated from educational technological development, in particular modernizing classrooms. These concerns prompt questions such

as what are the ways to incorporate ICT in classroom, what kind of ICT that should find its way in classroom and what reasons should it finds its way in classroom and with the rapid ICT changes how to cope with it in short and long term purposes without being technologically redundant and or obsolete?

The situations in USA and UK are an inadequacy of studies to provide the reasons for failed ICT practice (Archambault, Wetzel, Fougler et. al., 2010 and Al Mofarreh, 2016) in classroom instructions. The availability of ICT resources policy documents, vision, mission and other resources such as hardware, equipment, connectivity, do not automatically translate to effective use of ICT in teaching and lerning. This was demonstrated by UNESCO Report (2014) and Niamh (2010) where they stated that even with national policy guide, provision of hardware and software resources to schools in UK and USA are not themselves enough to create usefulness or effectiveness of ICT in education. This shows that mere provision of ICT resources although important; does not translate into delivery of much anticipated educational impact. Therefore, in the implementation process, there is need to focus understand more than just hardware or software of ICT. Yet the proponents of ICT believe that ICT is anticipated to improve teaching and learning environment. These agitators of ICT for teaching and learning have failed to provide academic solutions to questions of what, which, how, why, when and where of ICT resources. This forces schools to think beyond hardware and software in order to engage in a process that is beneficial to school, students and the entire economy of a country. It may be the way to ensure realization of effectiveness and efficiency of ICT in determining the outcome. There might have been lack of leadership needed to incorporate ICT, make them

useful, translating the technological resources into desired results. But a desired curriculum that provides a reference guide on the purpose, goal, implementation plan, measurement indicators, monitoring and evaluation plan, is critical yet missing. It is indicating that even with financial muscles to heavily invest in ICT; have all necessary hardware and equipment, internet and electricity connectivity among others the results have often proved otherwise (Mwawasi, 2014).

At the same time, in Sweden, it is reported that even though digital technologies have found their ways in education and instructions, their application are isolated and inadequate (Thullberg & Millstam, 2010; Skolinspektionen, 2012; Skolverket, 2013b; Skolverket, 2016a as cited in Salavati, 2016). Moreover, these technologies are often not used for academic but for administrative functions. This means that technoplogy applications for instructional methodologies (pedagogy) remain inadequate in Swedish schools (Salavati, 2016). However, application of digital technologies has risen in the last few years in Sweden. But of concern is the rising number of interactive whiteboards and use of tablet-devices, students carrying own private devices and teachers brining their own individual computers in Sweddish compulsory schools. All these do not show that Swedish schools have also witnessed growth in application of technology in classrooms. Also, mere authorizations of teachers and students to bring their own devices do not translate into technology that schools need. This complicates the situation further as desire to achieve specific academic goals of particular schools may not be achieved when there is no particular roadmap guide to be followed.

In Saudi Arabia, there have been massive investments in ICT for education; yet the results have often been disappointing. This has caused concerns in the circles of decision-makers and educators alike, trying to understand the causes of failures in ICT implementation of ICT in schools without solutions. Also ICT application in teaching and learning is still inadequately practiced in schools in Saudi Arabia (Ageel, 2011; Almadhour, 2010). A real gap between the availability of technological resources and their implementation approaches in Saudi schools. According to (Oyaid, 2009; Almadhour, 2010; Almalki & Williams, 2012; Al-Harbi, 2014), the Saudi government lacks adequate plans for ICT use in Saudi schools. Although Saudi Arabian government has large fund allocations for ICT in education, there is lack of leadership directing this implementation. However, research has not provided for the solutions to the kind of leadership needed to help implement ICT towards equipping ICT in schools (Almadhour, 2010).

According to Al-Sharija (2012) most school principals are tensed, confused and even uncertain about the application of ICT in Kuwaiti schools. These principals are stressed and lack the drives to (Al-Sharija, 2012) transform their teachers into a tam of experts who can suitably and adequately apply ICT to improve teaching. Due to lack of policy direction, guidelines and support, these principals continue to be anxious and confused. This may challenge the desire for school leadership to provide direction for technological change and transformation. According to Mathipa and Mukhari (2014) lack of confidence, often makes people avoid confronting such challenges. This researcher looked at how leadership practices of school principals contribute to the application of ICT in schools. It means that the aspect of leadership challenges that secondary school principals was adequately lacking.

Moreover, secondary schools and education system in Kuwaiti are not the same as those in Kenya and probably other African countries. Since the implementation of ICT processes vary across countries globally, what is good in Kuwait may not be for Kenya. It is only through conducting a reaerch that an academic conclusion can be deduced.

In Africa, things look even worse compared to USA, UK and Saudi Arabia. The education system in African region remains largely traditionally practiced. There is inadequate ICT application as teachers continue to use manual methods to prepare and deliver the lessons (Niamh, 2010). The level of technology application in instructional process remains very poor as teachers show no sign of desire to use any simple technology in other subjects than in computer study classes. The region is a home to many countries which are still grappling with poor technology application, which continue to widen the technological application gap between teachers and students of developed and developing countries (Bangolu, 2011 and Farrell, 2007). This means that these students may have to struggle to bring their economies at par with advanced economies that have strong technological use in eduction. According to Grono (2010) if African schools hope for minimizing the widening technological knowledge gap, technological and economic divide between itself and the rest of the world improvement in ICT application is very important. Yet secondary schools in Africa portray a picture of lack of capability to build teaching and learning environment that is ICT enabled. The school principals and other members seem inadequately equipped and show no readiness to transform their school environments into technology zones. This may be a barrier to achieve drive to use ICT for connecting and supporting leaders, teachers

and learners in different different academic roles in schools and create atmosphere for linkages of school community and home.

Moreover, most countries in Africa experience poor ICT investment in their education system. It means that a direction of resource mobilization for improved investment in ICT based curriculum and instruction is critical but lacking. Even though secondary schools desire inbuilt skills to create modern and better learning environments suitable for the introduction and application of effective ICT for teaching and learning and other management functions, but their scarcity is affecting realisation of such dreams. This has denied most secondary schools in Africa the opportunity to be proactive in creating productive 21st century schools. It means that the desired environment to drive ICT application in curriculum and instruction, although important, is limited. It is an indication that there is lack of capability competencies to respond to learners and schools needs for ICT practices, prospect and know-how; develop ICT outlooks and capability in teaching and learning methodologies, and practice; analyse data and use results to make better learning; build workforce competency; evaluate the educational dependability on ICT, software and structures and build and sustain superior content, infrastructure, and technical support (Grono, 2010 and Bangolu, 2011).

According to Kabanda (2012), most African countries have not been able to achieve universally accepted computer to student ratio of 1:15; they experience high rate of 1:61. Thius 1:15 was a recommendation from the most developed countries. However, as research has indicated, there are no universally anticipated or automatic outcomes or

impacts from using technology including computer devices in education. It means that this ration of 1:15 compared to 1:61 may represent different things from these different countries, and there is no yardstick from developed coutries that what works for them becomes a universally accepted indcators of good practices. Therefore such high rations reported from most African coutnries may be contributed partly by inadequate ICT resources in learning institutions in the region (Keiyoro, 2011) or may as well be own yardstick indicator of good practice from Africa. However, with the prevailing conditions, schools need to devise means of making their current state and translate traditional classroom practices into desired ICT educational system. In such environments, most schools show lack of strong drive towards realization of improved infrastructure in achieving the universal standard ratio of one-computer-one student. But pervious literature also point out realisation of poor results from one student to one laptop in primary schools where the project was launched. It means that there is need to establish the cause for this low level of infrastructure hindering effective implementation of ICT in curriculum and instruction. Equally, poor computer competency of students in majority of countries in Africa was subsequently caused by ICT resources inadequacies; for example shortage of standard learning buildings, protection concerns and availability of power. However, research findings also point out that even with adequacy of ICT resources in schools (Northhouse, 2010 and Schrum & Levin, 2009) there are no guaranteed benefits as supporters of ICT for modern classrooms and improved academic achievements. Further on, studies have not focused on the contributions of school leadership on the ICT infrastructure related challenges. This continues to advance the existence of knowledge gap given the inadequate literature on school leadership related barriers in ICT implementation

in secondary schools. This is lacking yet school leadership act as the main accounting and resource administrative officers. This puts them at the center of decision making and budgets allloation for a range of activities including implementation of ICT in the schools they lead. It means that school leaders or principals have the functional role of spearheading all their school improvements including technological changes in classroom and entire school teaching and learning system (Adomi & Kpangban, 2010; Andoh, 2012; Banju, 2014 and Mwawasi, 2014).

Further on, poor policy framework is also a notable challenge for the few African countries that have unsuccessfully attempted to introduce ICT programs in their instructional prctices. This has left ICT integration to teaching students of introduction to computers only and not in other areas of curriculum subject coverage, work play, instruction and learning. Although schools have their principals with administrative and academic management functions, most schools do not show strong drive towards technological use in education. The current situation may be a pointer of schools that lack the ability to design an ICT based curriculum roadmap. A blueprint for schools including determining how to apply ICT across all subject areas use of ICT adding value to the intended learning; align and give information, applications, competencies in the whole school, between educational institutions and teaching and learning systems; appraise the completeness, suitability, valuability and moral values ICT practices for all academic activities in schools. This can be useful for engaging teachers, principals and learners with ICT in better and effective ways. While this is the case, ICT is considered crucial to schools sand their curriculum and instructions. According to Al-Sharija (2012) ICT represent technological tools suitable for

modernising classrooms. These tools may include but not limited to interactive whiteboards, computers, multimedia, social media platforms, and intrnet as devices with multimedia functions suitable for interactive learning. At the same time (Beastall, 2006; Scrimshaw, 2004; The World Bank, 2008) ICT is considered effective in supporting learning through a number of approaches. These approaches may include simplifying communication processes, provide more opportunities for information access, improve chances of teaching and learning, especially for teachers and students with special educational needs, represents and and replicates a varieties of scientific phenomena. (Beastall, 2006; Andoh, 2012; Scrimshaw, 2004 and The World Bank, 2008). This can be a motivating factor to students' capability development in areas such as problem solving and critical thinking (Andoh, 2012 and Selinger, 2000). However, the current situation portays lack of school capable ICT users developed through effective school leadership. It may indicate inability of learning institutions to initiate effective ICT transformation in schools and foresees successful implementation. In the end many outcomes considered benefits (Asongu & Odhiambo, 2019 and Burden & Shea, 2013) of ICT inclusion and application in teaching and learning across subject areas may not be realised.

Given the government and its larger agencies interests in ICT, it remains critical to understand the causes of poor ICT policy framework development and implementation in schools. It is considered that with properly developed and implemented ICT policy, schools will be leading in the enhanced environment for easy ICT implementation. In Nigeria for example, the computer adoption was attempted in 1988, the plan did not go beyond distribution and installation of personal computers due to lack of a complete proper

implementation formula (Okebukola, 1997). Although Nigeria finalized the computer program in secondary schools in 2004, several challenges have led to low adoption rate of the program. These factors include limited or poor infrastructure, limited ICT facilities in learning insitutions, common power outages, inadequate capable manpower as well as high cost of ICT facilities (Adomi, 2006). A desired dream to Nigerian education system but its inadequate application tells of something wrong that research findings are yet to agree on (Grace, 2012 and Grono, 2010).

This Nigerian experience demonstrates that poor infrastructure, few ICT facilities in learning institutions, regular power blackouts and few capable manpower including high cost of technological devices as the main challenges. However, it was noted in USA and UK that even where comprehensive ICT was included in the school curriculum for instructions, the backdrop of outcome is a concern that secondary school principals need to urgently establish their working solutions. It implies that the desire to involve teachers and students to improve in their emerging ICT capabilities; provide quality learning and links staff to the rest of world, recognize and utilise ICT expertise and experience of teachers and students to further increase leadership and shared professional competencies and model planned and objective technological application, critically assessing the fundamental use of ICT in instructional work remain a challenge (Grono, 2010).

Also in Zimbabwe, there is inadequate use of ICT devices. Most of the computers continue to lye idle in classrooms, which has been related to lack of capable manpower, power or good facilities such as computer laboratories (Kabanda, 2012). Moreover, the country

experiences accessibility problems, especially access to budgetary assets, accessibility to ICT elements such as PCs, tablet-devices, combined printers, 2.0 web tools, digital TVs, computerized cameras, and projectors among others, it is basic to impact, start in order to put those framework into suitable utilize (Royer, 2002). The utilization of ICT in proper settings in instruction is recognized to have reasonably added substance impacts to learning instructions in schools. It means that upgrading viability of learning or adding a measurement to discovering that was not already accessible becomes a challenge.

Therefore, ICT should be considered as a huge motivational factor in understanding learning, and bolster understanding commitment with synergistic learning. But the reasons for the poor state of ICT implementation are a barrier to this realisation. Given the dynamic of ICT, the school directional focus is lacking leaving teachers and students stranded on the paths to take toward ICT curriculum use in schools with inadequate practices (Dzidonu, 2010). The administration has to endeavor to guarantee reserves that should be accessible to schools and give ICT foundation desired. But most schools are hardly engaged with arrangement of ICT gadgets that would support ICT driven curriculum implementation in these schools. This forces school leadership to ensure established environment that supports emerging teconolgy involved in all aspects of instructions. The leadership that can translate the current school environment into an ICT hub is critical yet lacking. A school leader with capabilities of transform the available manpower into technopogy expert capable of delivering the specific school desired ICT environment. However, most schools (Havard, et. al. 2016; Al-Sharija, 2012; Michael, 2016 and Salas-Pilco, & Law, 2018) continue to complain of inavailability of capable manpower, and a technology enabled environment,

which may be a pointer of danger that school leadership are in and unable to devise ways out. Yet the continued existence of these dangers may deny schools technological solutions that will support their specific instructional dreams.

Schools are required to implement ICT-literacy curriculum to make learner improve their ICT competencies and take the responsibility for their own academic and career roadmaps. However, it remains a challenge in an environment where teachers continue to largely transfer learning traditionally. In such environment, face-to-face model of teaching is continues to be largely practiced. Teachers use dust chalk, with black-boards, lack of interactive white boards, felt pens and multimedia used as medium of transferring curriculum content to students. Although this may be the case, apart from health issues, it is not known whether use of traditional teaching practices diminish quality teaching especially in an environment where examination and academic achievement yardstick pointers are also traditional in nature. This means that it is up to school leadership to be able to challenge the traditional teaching and learning practices and transform these practices to initiate technology in classrooms. Otherwise, the desire to transform or harmonize the traditional teaching and learning to introduce a curriculum that is fully technology infused may not be realised. The inadequacy of ICT instructions is a challenge or failure to realize actual benefits ICT-based curriculum in teaching and learning. It means that learniong institutions like secondary schools need the capability of changing their school environments to technology enabled and support use of ICT devices, ideas, people, process, procedures, organisation for problem assessment, and inventing, executing and managing answers to these problems. This can emphasize need for a student self-direction and self-regulation approaches. However, many schools continue to largely use traditional

teaching and learning practices. Therefore, the desire where major instructional and other learning activities move from traditional classroom methodologies to transform smart classroom practices is critical but not applied. Also lacking is the understanding of how transforming these traditional practices to modern technological approaches. Yet most of the changes being implemented disregard the original function of a teacher as a knoelwdge and learning transferer to learners. It means that school leadership must devise ways in which traditional teaching and learning practices are transformed, changed for better through technology (Menon & Suresh, 2020; Mtebe & Raisamo, 2014 and Mukuna, 2013) and still maintain the original function of teachers, otherwise creating teams of experts from teachers for technology implementation in school may be impossible.

Although there are worldwide technological development including span, speed, and availability, learning institutions have not been able to move with the same pace. This is because these schools have failed to change their traditional classrooms into ICT teaching and learning compliant. With all its recognized benefits, many schools have continued to lag behind this momentum. It is evidenced (Salas-Pilco, & Law, 2018; Ellis, Havard, et. al. 2016; Ungar & Shamir-Inbal, 2016) how facilitating smart classroom change in schools, and especially maintaining that change, depends heavily on capable leadership. Yet these revelations may be predictors of stressed and hardly capable pricipals to encourage teachers to strive to use ICT in all the aspects learning. Most of these principals seem less bothered to improve the situation yet in many schools ICT is only for basic computer skills lessons and are taught for an hour or two in a week. Moreover, this basic computer skills is considered aan added sDiscetionary subject to some students at the secondary school level.

In at the same time, the computer study classes would be introduced in Form II or Form III in different secondary sc hools. While this is the practice, most schools lack the ICT content and approaches suitable for teaching other subject areas sucu as Sciences and Hummanities in almost all secondary schools.

Given the trends in technology globally, failure to make real attemts is not a solution. The decision to make technology part of instructional system today is not an option. This means that ICT implementation is a reality to that many developed countries have adopted. Although ICT is considered influential to modern school classrooms interaction processes, its application across all school disciplines and activities faces greater threat (Michael, 2016). But ICT application in teaching and learning still remain the gateway for raising the educational standards, a responsibility that school principals must fulfill (Al Mulhim, 2014 and Muriithi, 2017) towards equipping learners with current ICT competencies.

This means that drive to make better educational standards across the world; USA, Europe, UK, Canada, Australia, New Zealand, Sweden, South Africa and others is a strongly pursued objective (Murnane & Willett, 2011; Neyland, 2011 and Ngololo, Howie & Plomp, 2012). But in Asia-Pacific, many countries lack strong systematic work in ICT application in teaching and learning, except in the Republic of Korea and Australia. This is also a pointer that countries differ widely when it comes to scope and variety of application and practices of ICT for instructions; hence it is unfair to try to come up with a uniform set of pointers that can be used to structure data collection for ICT in educational development plans. Thus it is not possible to reach a common consensus in building ICT pointers

applicable to all regardless of differences that countries have globally. Because this is not possible, schools must strive towards ensuring that they have ability to determine the kind of technology for their unique instructional demands. But school principals and ICT officers can develop ICT pointers that are locally usefulness, reliable to local school needs and stout to ehnace applicatilbity of ICT in specific school environments.

This leads to the major work ahead of school principals in ensuring successful and effective localization of ICT for greater benefits in their school instruction purposes. Lack of ability to localize technological content, tools and approaches may deny learning institutions the chances to benefit from ICT application in education. It also reveals continued existence of unresolved challenges experienced facing ICT-based curriculum implementation. Available studies have recognised that lack of ICT policies, vision, and mission, hardware, finances, connectivity and teacher student usage are still challenges affecting ICT implementation in most learning institutions (Crossman, 2019; Zaman et. al., 2011 and Salavati, 2019). It is therefore important for schools to develop ICT-Based curriculum that define the functions of ICT as used in education system. That may require secondary schools to have tools, techniques or methods of ICT usage designed as well. But most schools are in a dilemma of differentiating between ICT system as a medium of transferring school instructional learning but not to make learning effectively efficient. Choosing the form of ICT that will simplify teaching may be of great help to teachers and the schools at large. Also selecting the most appropriate ICT that support students learning too is useful for the students and their learning process transformation.

These events may act as barriers to having ICT-based curriculum that is referred to as the principal document guiding application of technology in instruction practices, especially in less developed countries, where it is inscribed in textbook officially including in which teachers rely on as a sole reference point. The learners may also be left without means of gauging which the safe education reference points, for example, websites that transfer authentic learner accepted content to visit. They may also not know what is curriculum acceptable to access including audio, text delivery, and images animation, streaming video, other multimedia resourcces such as tapes, DVD and USB storage and others. The purpose for having them, where and when used and the anticipated outcome is critical for their ultimate and effective application in classroom. It means that there is no curriculum guide on what to do just as the traditional classroom gives guidelines on what teachers or students need to do in classroom. This may be lack of curriculum culture that may lead to learners abusing use of ICT devices, processes and web-based access.

Although education stakeholders, especially in ICT field in most coutries in Sub-Saharan African believe that technology is a reagent for making better education results, available studies in this region have had thorough approaches to produce empirical evidence on the value and benefits of ICT to learners (Adomi & Kpangban, 2010; Mtebe & Raisamo, 2014; Tinio, 2003), makes better access (Rubagiza, Were, & Sutherland, 2011), or develops well traied graduates for globally competent workforce (Beetham & Sharpe, 2013). Theerefore the mistake of sending teachers and students to the web and computer resources without the principal guiding reference is a school failure from inability to take charge on content that teachers and learners should access. This may even expose them to obscene things, illegal

or things that are academically misleading. This goes against the recognition that ICT is an effective way for improving teaching and learning. It implies that mere exposure of teachers and learners to anything out there is not creating or improving quality of learning neither does it leads to effective learning. However, the drive to have ways for safe use of technological devices such as computers, other fundamental ICT contents that may capture devices such as interactive white board (IWB), copiers, LCD projectors, varied web-sites, social media platforms that support learning remain strong. Yet this drive largely remains on using ICT devices and not beyong that. It means that implementation of technology is left for having devices such as computers-devices, tablet-devices, pmart-phonesdigital or social media platforms, internet which may be contributing to illiteracy level of teachers and learners (Fomunyam, 2019; Higgins, 2017 and Piper & Zuilkowski, 2015).

All these experiences may be pointing out at schools inability or failure to establish that ICT is only used as a means for transferring or conveying learning faster and better, opinions, news, experiences, and suggestions to teachers, students and school community in order to resolve problems, come up with new ideas, or execute policies (Pulakos et al., 2003; Cummings, 2004; Wang & Noe, 2010). This reflects a process of education knowledge dissemination to effectively support team network (Wang et al., 2011), and activates learning environment transformed to conform to the 21st century ICT related design (Grant, 2013). This means that school leaders must work hard towards brining educational reforms that incorporate ICT in learning.

Also educational institutions do not have tools and means of measuring effectiveness or technological impact in education. Also in most countries there is lack of qualitative indicators as existing standards for monitoring technological use. This point out that most countries merely report information that is minimally helpful to other countries in their drive to building ICT hubs in education. It means that studies have hardly focused on ICT pointers for primary and secondary instructions. However, in the Republic of Korea, university level technology indcators are included while in Slovenia, pre-school technology idncators are shown. However, in Japan, ICT guidelines represent both the special schools for the blind and the disabled as well asa normal schools. Moreover, in Australia, ICT indicators for non-formal education are part of study literature. It means that without schools having ICT measures even determining successful ICT implementation becomes a problem. It means that one of the goals of ICT-based curriculum to monitor and evaluate implementation process yet without measuring indicators, then it becomes a challenge. Then schools need capabilities and readiness to design and develop own specific indicators for measuring any educational progress made. But the school leadership has not demonstrated the ability to establish such measures to ensure that technology is suitable and reliably introduced in instructional practices.

The challenge is that while it is recognised that ICT has transformed business industry, aviation industry, security industry as well as entertainment industry, what is still missing are pointers that ICT universally has similar effect on education achievemients (Ibenegbu, 2018 and Piper et. al., 2015). However, in equal measures, ICT has its unique problems vincluding knowledge divide, unequal availability of ICT hardware and software between

developed and developing nations well as school unequal ICT resources distribution. That means the education institutions such as secondary schools must come up with approaches of closing this digital divide gap else, majority of the teachers and learners will continue to lag behind others. Moreover, with many sources of funds to support ICT in education, proper reporting is fundsamental. But without ICT indicators for educational achievements, such reporting will not provide relevant information for financiaers as well as other stakeholders. This will make it difficult to demonstrate accountability to each educational. Yet currently the inadequacy or lack of education ICT implementation measures and measurement continue to reveal the existence of digital divide gap in what is reported and the actual situation on the ground. It means that without schools having relevant input, outcome, national educational and socio-economic and cost indicators, they cannot communicate a certain state, trend, warning or progress to the main stakeholders factually (Piper & Zuilkowski, 2015). Likewise, the school management remain in an awkward position for they may not own information that provides options for decision-makers. Also lack of these measures and further measurement of ICT curriculum implementation process, then it is not possible to know that should be implemented and what should not.

Further on, it is clear that provision and availability of technological tools and other resources do not themselves translate into effective and successful practice of technology for training learners to achieve improved learning results. For schools to realize impacts of technology on instructional practice, the process of implementing technology in curriculum must be defined. Yet most secondary schools have failed to achieve this and are unable to identify and select from among a range of technologies accessible to back instructional

methodoligies in schools and their roles. This has continued to be a fundamental issue of concern to the current education stakeholders (Farmery, 2014; Samarakoon et. al., 2017; Rambousek et. al., 2014 and Mavellas et. al., 2016). Evidence shows that although some technologies are adopted and used successfully within schools, others are not (Straub, 2009).lizing the school instructional impact from fully implementing ICT-based curriculum continues to be a challenge to the implementers. While teachers need adequate knowledge and demonstrated ICT capabilities, and a good mastery of ICT potential to enable them deliver reliable learning to learners, achieving this dream is hampered by lack of enough and capable personnel. Such situations show the need for transformed teachers into experts who can translate current environment into ICT functional zone for the benefits of learners and school educational system. This is useful in enhancing teachers drive towards proper integration of relevantly effective and useful ICT in their institutions (Menon et. al., 2020 and Cox et al., 2003). It means that the drive to integrate and align all aspects of ICT in instructional processes across all subject areas to support improved instructional medhologies is still a challege. This could be the reasons why most learning institutions still believe that technology distracts students, so phones, laptops, and computers must be banned from the classroom as their unapproved use is considered illegal.

Even with this ban though, instructional medholodies in formal learning environment increasingly moves towards being high tech. it means that directly or indirectly, technology is advancing and also affecting educational activities globally. But how can learning institutions such as secondary schools exploit their tech-know-how towards engaging learners with online tools to help them do classwork such as completing assignments, class

exercises, and projects while they are stil electronically engaged. Moreover, achieving this desire while still maintaining the relevance of physical school environment remains a nightmare. But teachers sometimes require their homework, presentations, a science project, or a math report to be done using computer. However, students have little knowledge of usage or where to access the availably enough tools that will improve learners engagements. This may force schools to continue to face the challenge of learnrs growing up in a tech-savvy world but without tech playing a big role in their classroom experience. These forms some of the problems schools have to contend with where ICT is needed in teaching and learning. It is an environment (Mehlinger & Powers, 2020) marked by the growing complexy and sophisticated devices, overstated claims of effectiveness by technology agitators, eratic and unplanned implementation by classroom teachers without proper monitoring and evalutation to determine effectiveness of technologies being implemented on learners. Moreover, those who are pro technology believed that technology will soon replace teachers from classrooms, however, this has not happened (Mehlinger & Powers, 2020; Mtebe & Raisamo, 2014 and Mavellas et. al., 2016) as the role of teachers continue to grow with changes in technology making these roles more sophisticated in technologicsally compliant environemtn. The typical view among educators is that technology can be used effectively to supplement instruction by providing instructional variety, by helping to make abstract concepts concrete, and by stimulating interest among students. However, in a formal learning environment where learners are required to learn various human skills, hardly can they achieve this through use of machines. Even acquiring technical and conceptual skills require learners to ineract with human beings, in this case, (Padayachee, 2017, Prait, 2017 and Rambousek et. al., 2014) teachers to enable them

develop interpersonal skills of inerracting with others and not mere confidence before machines which will fail them when infront of human beings later on in life. Therefore when implementing ICT, schools need the understanding that ICt is not automatic solutions to their school learning needs and must be carefully calculated.

ICT is specifically meant to improve instructional practices in schools. Therefore school leadership is needed that provides tools and methods for evaluating this main goal of ICT. The desire to understand whether technology had been successful in helping teachers to deliver quality teaching and also to allow students to discover more effective and efficient learning methodologies, are critical but lacking. Studies on technology and education are many but still coming up with solutions to ICT in education remain a challenge. Some findings from these studies indicate that no benefits gained from employing any specific medium to convey instructions. Also such medium do not influence learning under any conditions but are mere tools used to convey instruction and information and do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition (Kisirkoi, 2015; Clark, 1983) as cited in Mehlinger and Powers (2020). According to Clark, any positive results that were gained by experimental groups over the control groups were easily accounted for by differences in instructional strategy. It means that ICT should not be treated as a lasting solution to learners' academic weaknesses. This means that where a student is poor in content and conceot development and mastery, mere use of ICT will not solve such problmes. That way, ICT is not a means for changing poor academic state of a learner to excellent performer. Moreover, technology may not automatically encourage learners to change their lazy attitude towards learning. It

means that any lazy learner will remain lazy and technology may not be of much help. This means that schools must identify the goals of ICT clearly to enable implementers suitably focus on only technological aspects that are useful (Hennessy et. al., 2010; Hennessy, Onguko, Ang'ondi et. al., 2010; Igun, 2013 and Ibenegbu, 2018).

In Kenya, secondary schools only offer computer studies as independent subject and not use technology as a tool for instruction across all other subjects. This denies students the opportunity to develop technological skills across other subject areas. It may mean that they will not be able to appreciate the importance of computers in education system. Moreover, they will lack ability to develop better knowledge for safe use because they lack the understanding of the importance of ICT for learning, network with the global society for learni g purposes and have them live in a fast changing world of technology (Hennessy, Onguko, Harrison et. al. 2010). It means that secondary schools and any learning institutions must have better understanding of what ICT they want to impelemtn in curriculum. Yet the current situation portrays a picture of institutional inability to direct on the kind of technology suitable for their specific schools. Also the current practice in most secondary schools, even in computer studies classrooms, remain traditional approaches. Therefore, subjects like Mathematics, Geography, English, Kiswahili, Arts and Crafts, Biology, Chemistry and Physics among others continue to lag behind ICT practice as a tools to aid instructional practices across all these subjects. Yet the desire of Kenya, just as rest of the world, is to use ICT in classroom instructions across all secondary school disciplines. This has left sole responsibility and accountability of implementing ICT to the respective schools. But these schools lack the roadmaps towards suitable ICT use.

Subject areas such as Mathematics, Biology, Chemistry, Physics, Geography, English (Grammar, Poetry and oral Literature), Home-Science, Arts and Craft, History, Religious Education, Power Mechanics, and Agriculture among others continue to be largely taught and learnt through traditional methods. In such classrooms, teaching and learning is through teacher-centered approaches. This means that the desire to transform educational institutions into smart school systems by implementing ICT-based Curriculum is a dream yet to be accomplished.

Moreover, as technology is only incorporated learning as a separate and Discetionary subject in secondary schools in Kenya. This does not make technology, mainly basic computer skills and not other technological competencies mandatory, hence done selectively by schools and students. As an Discetionary subject, it may not be taken seriously by teachers and learners. Moreover, putting efforts by implementers to innovatively establish ICT tools that aid effective teaching and learning may not be pursued. This may imply that the current ICT policy in the country may itself serve as a support tool or a barrier to effective implementation of ICT-based curriculum in education system.

These secondary schools need to establish assistive and instructive ICT tools identified to specifically support the objectives of their curriculum and instruction. Many schools continue to believe that merely making computers and Internet access available is enough. Without the development and provision of local content relevant for teaching and learning

Biology, Mathematics, Chemistry, English, or any other subject area in Kenyan secondary schools is important but inadequate or missing altogether.

It means that achieving this desire may not be possible when ICT-infused curriculum is not suitably, effectively and successfully implemented in the education system of the country. Moreover achieving the objectives of ICT curriculum intent implementers may also fail to be realised. These objectives include apply change management strategies in embracing ICTs in their work, facilitate and inspire innovative and creative learning, create and manage an effective ICT integrated learning environment, engage in monitoring and evaluation of ongoing ICT integration programs, appreciate the role ICTs play in day to day lives, sustain virtual collaborations with peers on educational environments and to engage in professional development and model ethical responsibilities.

But it is recognised that ICT continue to perform a fundamental role in school instruction process across all subject areas. Hence, many educational institutions, including those in the Kenya, are already working hard to include ICT in their classrooms practices. It means that schools must work out realistic approaches to make ICT use in education instructions for all the subjects is realised. However, the current practices imply that only in computer study, where computer introductory content or elements are covered. Given that this is focused mainly on computers introduction skills, other fundamental ICT contents relating to devices such as social media, interactive white board (IWB), copiers, LCD projectors, and others are hardly used in classrooms. This has left the drive for ICT use in teaching and learning to just but computer introduction, which is by the way Discetionary, leaving teachers and learners to remain largely ICT illiterate.

ICT-based curriculum implementation in classrooms refers to desired application of ICT across all subjects in secondary school curriculum and any other school instructional activities aimed to improve academic outcomes. It generally implies the inclusion or infusion of ICT or technologies into instructional practices during learning process. The challenge that many learning institutions face is the availability of varieites of technologies that can be used in school instructional purpose. These technologies have different roles as well; therefore school leadership must be capable to identify specific technologies whose roles are fundamental to educational needs and instructional demands. But this has never been simple, hence most learning institions often make available technologies that are redundant to learning process, some are just kept in stores never to be used. At the same time, evidence point out that although some of these technologies are accepted and applied victoriously in schools, not all are implementable successfully (Linways, 2017) so without ability to identify and select the appropriate ones make ICT implementation process difficult and hence making these secondary schools continue being part of the world lagging behind the application of technology in training. Given that learners are familiar with technological tools and are hoped to learn better in a technologically integrated environment, therefore desire to implement ICT-based curriculum remain critical. This is because, technology is considered useful tool that contribute many benefits to pedagogical practices where ICT use can create effective instructional practices (Padayachee, 2017 and Jamieson-Procter et al., 2013). This means that technology can be modified to accommodate local contents to be used in all the subjects including mathematics, science,

languages, arts and humanisties. Also other major fields can be learned more effectively through infusion of technological compnents, tools and equipment.

Therefore, among other practices, schools need need to devise ways to expand technological environment for learning. It means that school principals must demonstrate their power to transform social media platforms such as Facebook Live, Facebook, Youtube, Viewsasa, *Twitter*, blogs pages and other instant messaging tools into pedagogical instruments for enhancing learning interactions across the globe. But continued use of traditionally old instructional methods in these secondary schools remains a challenge to the dream for an ICT based learning environment. The traditional methods include face-to-face teaching, use of blackboard and dust chalks, note dictation, and hand written assignments. These traditional methods confine the instructional process to the classroom setting and cannot be enhanced beyond the classroom yet social networking sites can make learners to engage in a communicative platform to facilitate collaborative discussion, exchange of opinions, and critical thinking (Cheng, 2012). Especially at a time when Corona Virus pandemic continue hitting the world so hard, use of technological methodologies for teaching is fundamental yet schools are ill prepared to provide platforms where launching of such learning practices can take place (Porter, Hampshire, Milner, Munthali, Robson, Lannoy, Bango, Gunguluza, Mashiri, Tanle and Abane, 2016).

Also a leadership that can transform pedagogical content of ubiquitous wireless is critical but missing. This can provide the rapid penetration of wireless networks (Jung, 2006) to foster teachers' and learners' alternative sources of instructions through using convenient or movable apparatuses including laptop-devices, tablet-devices, and smart-phone-devices

among other simple technological machines that can be converted into educational tools. Yet most schools continue to use hardcopy text books throughout the process of teaching and learning. These do not provide currently updated content and information, leaving the teachers and students to be masters of outdated curriculum details. Moreover, such education system hardly qualifies to provide the much anticipated 21st century knowledge and skills (Cassim & Obono, 2011; Cheng, 2012 and Mehlinger & Powers, 2020).

Again, school principals can guide their schools to use intelligent searching and educational gaming in classroom practices. These may enable teachers and learners to explore, put in usable form and trace data in a more effective and suitable way for learning (Lwoga, 2012). They must also be able to make instructional practices including games and simulations, considered training tools to have benefits and effects on motivating learners, enhancing communication skills, critical thinking skills, and problem solving abilities (Jung, 2006). There are inadequate practices and inadequate literature available on ICT implementation in secondary schools in developing world, which means that adequate knowledge about suitability and effectiveness of technology based learning in education system remain a challenge. Yet there are many technologies that can be introduced in schools, which are good in motivating teachers and learners, but hardly find their ways in classrooms. Some of these technologies may include flourisnhing multimedia technologies such as online live platorms, visual aids, sounds, video clips, and animations that can be useful in motivating learners by attracting their attention hence elevating their interest and desire for more efforts in education (Kuo, 2009).

Further on, the Internet connectivity can be used as tools that enable learners to expand access to reliable learning materials. The use of internet connectivity to take lerning online can make Mathematics, Biology, Chemistry, Physics, Geography, English (Grammar, Poetry and oral Literature), Home-Science, Arts and Craft, History and Agriculture among others instructions more interesting (Dang, 2011). Hence, using online resources can expand learning in both indoor and outdoor classroom activities therby enhancing competences of learners in problem solving, critical thinking, speaking skills, reading, listening, writing and comprehension skills (Lwoga, 2012 and Linways, 2017). According to Kelsen (2009) YouTube continue to be one of the potential online interactive tools that can link learners to reliable materials in areas such as Mathematics, Biology, Chemistry, Physics, Geography, English (Grammar, Poetry and oral Literature), Home-Science, Arts and Craft, History and Agriculture among others. Such inputs can offer life experience and give a channel where learners can have discussions, share ideas and feelings and be part of a web-based learning. But schools have failed to make use of such tools as most of these have not been able to transform and convert local syllabus into technologically accepted information that can be reliably accessed online through tools like Youtube, Linkedin, Skype, Facebook Live or other devices in that form, for students to access their school specific materials online.

In the Kenya, the inclusion of technology in all subjects under secondary school curriculum is also strengthened. The ICT policy guide developed by the government through the Ministry of ICT, the Kenya government has challenged secondary schools to make use of ICT policies and Sessional papers to ensure ICT is included in all aspects of secondary

school curriculum. Therefore secondary schools must devise mechanisms through which they can promote technology use in instructions. However, more than a decade ago, todate many secondary schools are lagging behind in the inclusion of ICT application in all aspects of secondary school curriculum instructions. Equally, ICT policy guide for secondary schools in Kenya, which serves as framework only provide for the basics of introduction to computers (both software and hardware). It does not provide direction on what to offer across academic content area instructions from ECDE to secondary schools. This leaves the sole responsibility of implementing ICT-based curriculum in the hands of school principals.

However, many teachers may not have the technical skills to make full use of these technological resources in their instruction especially traditional teachers who patronize the conventional instructions. Some teachers are also indifferent when it comes to application of technology teaching languages due to different factors. These factors include inability to incorporate ICT in preparing for lessons, lack of interest, teacher attitude and perception towards ICT and try to make sense out of their environment by selecting, organizing and interpreting information from the environment (Mathevula & Uwizeyimana, 2014 and Mavellas et. al., 2016).

This is to say that although progress has been made, many countries, including Kenya, are facing similar problem. The main challenge is that schools are unable to make teachers maximise technological application in their instructional practices (Albirini, 2006). This means a great challenge for teaching practices since studies have shown that inclusion of

ICT in learning process could improve learners' performance (Nakayima, 2011, Jamieson-Proctor et al., 2013). Also it has been shown in literature (Cassim & Obono, 2011) that the correlation of teachers' belief and the use of ICT are significantly high. However, ICT is not the only way towards iproving academic performance. According to Neyland (2011); Ngololo et. al. (2012) and Oliveira and Martins (2011) school inputs can make a difference in student learning and achievement. Likewise, in recent years, a significant number of studies have investigated the role of teachers in student achievement, and a vast majority of them revealed that there is an important linkage between teacher quality and student achievement (Neyland, 2011; Ngololo et. al., 2012; Oliveira & Martins, 2011 and Padayachee, 2017). The strong link between teacher quality and student achievement is now a well-accepted phenomenon. Given this fact, with improved inputs including continuous in-service professional development activities with declining student performance in classrooms and outside school is an indicator of an aspect of failure from the teachers' side. It is also recognised that providing effective professional development to teachers plays a key role in improving teacher quality, which eventually results in greater student achievement (Edge, Reynolds, & O'Toole, 2015; Hilton et. al., 2015).

This means that teachers' role is getting more important, in particular technology use in pedagogy and this may improve learners peformance. Teachers facilitate, moderate and suggest while allowing the students to experiment, ask questions or perform activities that require the student's full participation. Moreover, teacher may also provide support in areas such as problem solving and inquiry-based activities with which students formulate and assess their ideas, come up with conclusions and inferences, and pool and convey their

knowledge collaboratively. Thereore teachers are equally important part of technology implementation. That means any educational reform should consider the purposeful development of suitable knowledge, skills and attitudes of teachers (Cuban, 2000). Shahan (1976) argued that human element is fundamental to school reform. It means that there is a need to enhance teachers' competencies towards making technological infusion in teaching successful. Similarly, Fullan's (1982, 1991, 2000) theory of school change also emphasized that the modification of mindsets, such as pedagogical assumptions, values, and beliefs are instrumental in any educational change effort. That means building on individual attitudes and perceptions regarding ICT tools are equally essential. Veen (1993) argued that effective implementation of technology depends upon users' (teachers and learners) having a positive attitude towards it. This point to a condition where school leadership should work harder to encourage and improve technology use and also ensure that actual take-up, which largely depends on teachers' personal feelings, skills, and attitudes towards ICT, is also influenced. This implies developing positive attitudes toward techologial use in classrooms and perceives as tool to aid improved instructional practices will evidently influence technology integration in all subject areas of teaching (Becker & Riel, 2000; Cox, et. al., 1999; Pedretti et. al., 1999; Sandholtz et. al., 1997).

1.2 Statement of the Problem

Despite efforts of Kenya government and the ministry of education to change Kenya into ICT hub, the success of transforming classrooms into smart classrooms is still a dream many secondary schools can't meet. Although the national ICT policy dictates the need for the country to digitalise, and learning institutions to improve technological application in

learning, this is not yet converted into practice. It threatens usefulness of government investment in ICT infrastructure such as fiber optics, balloon internet technology, and other forms of wireless technologies. The current policy that does not give it mandatory for schools to use ICT across subject areas needs approaches of changing it. This means that schools lack the derives to apply ICT in all the subjects including mathematics, chemistry, biology, physics, practical subjects, English grammar and literature, and history among others. Moving beyond mere integration is lacking, these schools are unable to implement an ICT-based as a key reference point for teachers and students guiding use of various ICT resources in instructional use. If not urgently solved, then government investment in ICT infrastructure, desire to train ICT experts equipped with 21st century skills to drive its economy to global competition is unattainable. For many years now, ICT implementation remains in the hands of ICT managers most of whom have inadequate academic and classroom management expertise. When will the school principals take over this role to ensure the right diffusion and progress of ICT?

This situation exposes teachers and learners to ICT tools, processes, procedures, resources, and strategies without proper guide on the use of technological tools in improving instructional methodologies. Schools may have technological devices such as internet access and other multimedia tools but how, what where and when to use them is missing. This leads to abuse of ICT systems leading to accessing misleading ICT resources that do not support formal teaching and learning. Apart from their inability to establish whether ICT has made influence on learners, selecting technology suitable for teachers and students remain a challenge to most schools. This has left ICT-based curriculum implementers

without actually implementing suitable and relevant technology for their specific school and country needs. Coult it mean that this is why most schools still have their classrooms furnished with dark residue chalk dividers and without nearness to ICT markers. Where ICT would improve efficiency and effectiveness of instructions, poorly implementation would deny the realisation of this dream. Equally, the rapid changing nature of technology also poses a challenge. Just like silent films that were produced for instructional purposes and were believed would make books obsolete in schools, take teachers out of physical classroom but for centuries teachers are still in classroom and text books are still not obsolete; school leadership have failed to demonstrate clearly objectives and goals for their drive for technology in classrooms. From the silent films to the digital era of social media, rapid changing ICT world itself is a challenge that requires leadership that foresees in advance to avoid being technologically redundant or obsolete. However, most schools continue having obsolete ICT devices such as old computers that no longer perform just the simple MS Word functions. Some schools still use technologies that do not exist in modern world today. The problem of selecting from array of tech resources to suit their educational needs remain a challenge. Furthermore, for decades, secondary school students continue to poorly demonstrate ICT use improve their achievement and to prepare for contributions in the digital, globalized world.

While these problems are known to the educational stakeholders including policy makers and implementers, access to the right information with indicators that measure technological impacts are still missing. There is an urgent need, therefore, for a secondary school leadership to transform their current educational states into opportunities, if current

efforts to make ICT-based curriculum implementation to succeed. Such leadership should start with formulating ICT goals, purpose, ICT implementation plan, a set of indicators of ICT use and impact in education and tools of translating available ICT resources into classroom results. However, what is witnessed in secondary schools indicate otherwise lack of drive for schools to make better the technological inclusion in instructional practices.

1.3 Justification and Rationale of the Study

This study seeks to investigate leadership challenges faced by school principals when implementing ICT-based curriculum and instructions in secondary schools in Elgeyo Marakwet County in Kenya context where secondary schools were the target. Further, this study explored the use of ICT in classrooms as well as the criterion that school principals use to select ICT tools for teaching and learning. This study was inspired by several apprehensions or concerns within the educational domain were teachers seem unaware of the potential use of ICT in teaching and learning (Mselle, 2012; Ndibalema, 2014).

In January 2006, Kenya promulgated a National ICT Policy in that aims to improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services. The section on information technology sets out the objectives and strategies pertaining to ICT and education. The relevant objective in this section states that government will encourage …the use of ICT in schools, colleges, universities and other educational institutions in the country so as to improve the quality of teaching and learning.

This is an ICT policy that serves as a guide in providing educational stakeholders the required guidance in integrating ICT in teaching and learning (MoE, 2005). Many countries in sub-Saharan Africa, Kenya included, are investing heavily in ICT infrastructure (Igun, 2013). The Kenyan Ministry of Education, Science and Technology (MoEST) is focused on improving quality and on utilizing ICT to improve learning outcomes (MoEST, 2014). The Kenyan policy environment reflects this intent, with the development of a national ICT policy (Republic of Kenya, 2006), the notable focus on ICT in the National Education Sector Plan (NESP) (MoEST, 2014), and the inclusion of ICT in both the Education Act of 2013 (Republic of Kenya, 2013) and the Sessional Paper No. 14 of 2012 (Republic of Kenya, 2012), which is the guiding policy document for the sector.

While the Kenyan ICT policy was revised in 2000, Moonen (2008) maintain that many developing countries are currently developing ICT policies to help in the implementation of ICT in schools. According to Nihuka and Voogt (2011), several international studies are published to show that primary school teachers lack competencies on the use of ICT as a pedagogical tool necessary for teaching and learning. Thus, it is crucial to undertake this study to probe further in the Kenyan primary school context. According to the ICT Policy for Kenyan Education, the use of ICT does not only provide an advantage delivery of equitable education, but it improves the quality of education (MoE, 2005).

The recent report by the National Council for Science and Technology (2010) indicated "that computer use in the management of Kenyan institutions is still in its early phases. Yet the key documents to refer to for ICT in education implementation guidance include

National Information & Communications Technology (ICT) Policy, 2006, Curriculum Guide for ICT Integration in Education 2012, National Information, Communications and Technology (ICT) Policy 2019, Aligning Education and Training to the Constitution of Kenya (2010) and Kenya Vision 2030 and beyond 2012, national ICT strategy for education and training 2006 among others.

Considering the fast development of ICT, Mathipa and Mukhari (2014) were certain that many educational systems would be formalizing the integration of ICT in teaching and learning. This is particularly important for remote or physically challenged students who intend to access formal education with ease. Thus, schools should no longer continue to only be viewed as venues where knowledge is transmitted from the teachers to learners by using textbooks as the only source of information. At the same time, ICT is seen as a mere vehicle to support teaching and learning without altering the traditional roles of teachers and the school setups. Consequently, teachers are encouraged to integrate ICT into teaching. As the use of ICT is increasing in all sectors, Ghavifekr, Kunjappan, Ramasamy & Anthony (2016) believe that its use in education has the potential to transform teaching for the desired results. It is believed that teachers should integrate ICT into the curriculum, and bring about effective teaching and learning practices. However, it is the curriculum that teachers should implement to bring harmony, uniformity and quality standards in teaching and learning.

The current trends in education require a paradigm shift from the mere supply of ICT in education into a comprehensive implementation of ICT-based curriculum in education.

However, the school principal leadership holds towards the implementation of ICT-based curriculum in teaching and learning and may be a key determining factor to the success or failure of the implementation of ICT-based curriculum in teaching and learning (Apeanti, 2014). As a result, it is vital for this study to gather information on the perceptions of the Kenyan primary school teachers towards the ICT-based curriculum in classrooms. On the one hand, the results from this study would therefore be helpful for the curriculum developers and policy makers to make informed decisions as far as the provision and strategies for the use of ICT in teaching and learning are concerned. On the other hand, the results would also be essential to the school principals and teachers training institutions to intensify their training programs in line with the training needs emerge from this study. Furthermore, results may also help the Continuous Professional Development (CPD) or in-service education to strategize on how to help schools in making effectively useful ICT resources for teaching and learning at secondary school levels in Kenya. This way Kenyan education system may benefit from its human resource development that may bring the economy to a competitive global level.

1.4 Purpose of the Study

Therefore, the purpose of this study was to investighate the leadership challenges faced by school principals when implementing ICT-based curriculum and instructions in secondary schools in Elgeyo Marakwet County.

1.5. Specific Objectives

The specific objectives were:

i) To establish the Education Technology Leadership Challenges School Principals experience when Implementing ICT in Secondary Schools in Elgeyo Marakwet County

ii) To determine the kind of Transformational Leadership Challenges facing School Principals when Implementing ICT in Secondary schools in Elgeyo Marakwet County

iii) To Examine Nature of Instructional Improvement Tech Leadership Challenges School Principals Experience when Implementing ICT in Secondary Schools in Elgeyo Marakwet County

iv) To establish the ICT Change Agility Leadership Challenges School Principals Face when Implementing ICT in Secondary Schools in Elgeyo Marakwet County

1.6 Research Question of Study

To achieve the specific objectives above, the project aimed to answer the following research questions:

i) What are the Education Technology Leadership Challenges School Principals experience when Implementing ICT in Secondary Schools in Elgeyo Marakwet County?

ii) Which are the kinds of Transformational Leadership Challenges facing School Principals when Implementing ICT in Secondary schools in Elgeyo Marakwet County?

iii) What are the Nature of Instructional Improvement Tech Leadership Challenges School Principals Experience when Implementing ICT in Secondary Schools in Elgeyo Marakwet County?

iv) Which are the ICT Change Agility Leadership Challenges School Principals Face when Implementing ICT in Secondary Schools in Elgeyo Marakwet County?

1.7 Assumptions of the Study

Assumption refers to unique facts presumed to be true but have not been verified, which have the potential to influence the direction of study (Orodho, 2005). In the study the following assumptions were made:

i) That the secondary school principals have faced educational technological leadership challenges in implementing ICT based curriculum in secondary schools in Kenya.

ii) That the school principals have experienced transformational leadership challenges in implementing ICT based curriculum in secondary schools in Kenya.

iii) That the secondary school principals have experienced instructional leadership challenges in implementing ICT based curriculum in secondary schools in Kenya.

iv) That the secondary school principals have experienced ICT change agility leadership challenges in implementing ICT based curriculum in secondary schools in Kenya.

1.8 Delimitations of the Study

The study was therefore limited to and restricted to public and private secondary schools in Kenya. The researcher focused on four (4) objectives only. It was done on secondary school

principals and implementation of ICT- based curriculum. The study utilized both questionnaire and interview to get more comprehensive data. The study focused on the leadership challenges faced by school principals when implementing ICT-based curriculum and instructions in secondary schools in Elgeyo Marakwet County.

1.9 Limitation of the Study

The study encountered various impediments that were experienced during investigation. It is evident from literature studies that there are several factors that influence implementation of ICT-based curriculum in learning institutions including ssecondary schools globally. The study was well informed that comprehensive inclusions of these factors do not automatically translate to improved instructional approaches of classroom performances. The study therefore was restricted to the leadership challenges faced by school principals when implementing ICT-based curriculum and instructions in secondary schools. It was also restricted to Elgeyo Marakwet County secondary schools, which may not be a true picture of the entire country.

1.10 Theoretical Framework

In theory, using ICT in education has the potential to enhance the quality of teaching and learning, the research productivity of teachers and students and the management and effectiveness of institutions (Kashorda *et. al.* 2007). This implies that the study on ICT implementation in schools could not be exhausted without considering ICT change agility leadership, instructional leadership, transformational leadership and educational technology

leadership. As a guide to this study the Open System Systems, Technology Acceptance Model and the Model of IT implementation process theories was used.

In theory, ICT application in education is recognised to be useful and effective in improving teaching and learning practices. ICT also has the ability to improve the research productivity of teachers and students as well as effective institutional administration (Kashorda *et. al.* 2007). It means that in studying ICT implementation in schools, the main focus would be on leadership that takes learning institutions from beginning to the advanced levels in application of technology. This study therefore was exhausted after thoroughly investigating ICT change agility leadership, instructional improvement technology leadership, transformational leadership and educational technology leadership. The study was therefore guided by the Open System Systems, Technology Acceptance Model and the ICT implementation concept.

The open system theory states that human beings are core in initiating Information and Communication Technology (ICT) into any organisation. Having introduced the ICT, it is the same human resources that also ensure that ICT is put to use. Therefore, the human being has the power to determine what they introduce and what they do not introduce. For example, studies done in USA found out that all teachers keep changing their instructional practices, where minimal number quickly accept and use digital technologies but majority refuses to embrace it instead, they either wait to use later or reject these technologies altogether. It means that where human beings are not made to change their mindset, their perceived beliefs and strong drive towards desire to select and reject some practices, even

those considered useful for their own teaching approaches, then the slowness of technology use in school may continue.

It means that where this does not shift or change, then teachers and even learners, may not change to adopt various aspects of their teaching and learning that ICT may introduce such as incorporation of better study material, contemporary means of conducting group work or contemporary techniques for instruction learned from innovative colleagues are jeopardized. Moreover, if not given proper leadership then the aspects, purpose and types of technology that are suitable and reliable to schools may not find their way in learning process. But studies have widely identified these aspects, purpose, and types of technologies but have failed to also identify the kind of leadership needed to gather all issues and put to use for properly supported environment suitable for implementing ICT in learning institutions.

This is because leaders make decisions suitable in solving specific problems; including determining the approaches that need to be taken by all members of an organisation. Such leadership may be demonstrated by school principals, in organisations like the schools that they lead. Therefore, managers or school principals must have the ability to show their understanding of how new technologic approaches can be aligned to their school or organisational needs, in order to support initiation of successful ICT system in their environments. In the case of secondary schools implementing ICT based curriculum, a leadership that understands how curriculum can be ICT enabled to enhance its roll-out in a

pace commensurate to the technological advancement rate. This way, having redundant or obsolete technologies or lagging behind others may be avoided.

In this study, the concept of ICT implementation dynamics informed the theoretical framework that ICT introduction in schools as an interplay of multiple stakeholders not a single concern and must focus mainly on instructional methodologies and learning perspectives not ICT devices or machines (Smylie et. al., 2004 and Van der Vegt et. al., 2001) and that among the multiple stakeholders, merely being skillful and competent in using ICT devices and machines, the main stakeholders such as teachers must demonstrate competencies on the way ICT and instructional resources work and how learners schoolwork have to reform while maintaining the original intent of learning and role of a teacher. This was an indication for the desire to pursue the learning organisation perspective (Fullan, 1993; Senge, 1990).

Also a situative point of view with the unit of assessment as the action framework to outline school wide ICT usage was utilized. This has been generally applied to areas such as recognizing, reasoning and acquring (Brown et. al., 1989; Greeno, 1998; Lave & Wenger, 1991) and strategy usage (Spillane et. al., 2002). With its accentuation on the bigger frameworks wherein the school principals, instructors, and learners connect with one another, the situative viewpoint has guided the comprehension of school wide ICT usage because of movement between instructional intercession and hierarchical mediation to accomplish changes in students learning, with specific consideration given to the frequently

overlooked social settings and institutional culture in which educators are arranged (Windschitl and Sahl, 2002).

Furthermore, the open system systems theory, gives a focus on the understanding of a school as a distinctive case of an organization, which has socio-technical system consisting of many sub-systems: human, technical, and structural and task (Owens & Steinhoff, 1976). This supports the situative viewpoint that indicated school as an organisation with multiple and diverse players, institutions, affiliations, and opinions, including influencing and challenging matters. The main player is human sub-system who has influence or control over any of these multiple and diverse players. This human sub-system is composed of teachers, principals and support staff all who coordinate and network to deliver desired specific school instructions through a suitably designed and developed curriculum, which should implemented effectively and successfully and subsequently assess progress of learners. But human sub-system does not work independently, therefore, organisations have structures in which work performance flow, without which a direction for improvement may not be determined. Therefore, this theory is of view that even the introduction of ICT into school learning process, apart from making the technological resources available, human direction is fundamental to ensure that only what is relevant to the curriculum and instructional practices only get to the hands of human resource and make proper use of it in completing academic tasks.

However, in the case of this study, this human sub-system needs a background that influence their interest in accepting school reforms including making use of the

technological resources. Especially, in an environment where human-sub-system went through a training process, which is not technologically based, therefore, making them to shift from their conventional background to the contemporary practice may require another human-sub-system of leadership to transform or translate these backgrounds into what is desired for schools to implement ICT-based curriculum in their entire teaching processes. But this aspect of the theory has not shown how the human sub-system can be utilized in order to achieve success in the implementation of ICT-based curriculum in schools. It has not helped in coming up with solutions to the problem of how to use digital technologies in schools and how to transform technological use to cater for administrative tasks and as supportive tools for instructional work.

On the other hand, the schools sub-system includes structure that consists of the leadership and management and how both interact with the environment beyond school to enhance improved shift in the way of doing things. It means that in order to introduce innovative changes in schools, there is need to understand the interactions of the four sub-systems and then the structure and how this structure influences or influenced by the external environment. The sub-systems must be organised into a way they can coordinate and interact towards achieving a common purpose. Where the structure is not properly put, forcing it to produce desired outcomes and impacts becomes difficult. As part of management, the school principal must provide administrative and a management function to build a school sub-system that is ready to deliver desired results including ICT implementation in schools. Apart from managing, school principals must also provide the right leadership that transforms resources available and translate them into specific school

needs. This concept is critical to this study for it gives a guide on the process that school principals can take to lead and provide control of technological activities in their schools towards achieving desired end. However, the concept does not give clear approaches that must be taken to change the conventional environment into the contemporary ICT school environment. This could make it difficult for school principals o focus on specific aspects instead of grappling with the multiple technologies that are not all adoptable for school purposes.

This study also used the Technology Acceptance Model (TAM). This was useful in planning and foreseeing and clarifying ICT usage and the things that make potential implementers acknowledge being actively involved in the execution cycle or rejecting the utilization of technological innovation together. This theory envisaged the perspectives toward the desire or interest to use the systems (Davis, 1989). It takes a gander at the apparent handiness which alludes to how much an individual accepts that utilizing a specific framework would improve execution and the apparent usability which focuses on how much an individual accepts that utilizing a specific framework would be liberated from exertion. It considered any pre-determined usefulness of any change in using the systems and whether such systems would improve instructional methodologies and also improve learners' perspectives and accept and use technology in their various learning aspects.

Moreover, technology leadership is critical for change leadership framework. According to Schrum & Levin (2009) technology leadership recognises that there is ever evolving technologies. That technology is never static, it is constantly changing. Therefore,

technological implementers must master the erratic nature of contemporary and emerging technologies. The implementers must also recognise that any change that is ignored may render any implementation process redundant or obsolete (Fullan, 2001) hence the need for technological leadership for academic purposes in schools. Therefore, school principals must be capable of dedicating their efforts to develop leadership that effectively adapt to transform and support the school objectives, which are aligned to technological reforms.

According to Fullan (2001) leaders can demonstrate their effectiveness by understanding reform process. This change process is when leaders develop a sensible implementation roadmap that is integrated in the goal of that leader. Although this development of suitable implementable roadmap, a leader need to be determined to be able to properly plan and come up with what is relevant to their institutions. Such plans must be delivered within time frame without delay, this will rescue an institution from lagging behind or often implementing obsolete or redundant plans no matter how best they may become. This means that organisations or schools need leaders with sharp focus, who can spot technological trends and master it for their leadership efficiency and effectiveness. Without this sharp focus and ability to spot rapid changes, a leader may caught up within a mixture of change and may not properly define the appropriate path to follow, which may jeopardize technology implementation process.

Learning from Fullan's (2001) work implies that transformation leaders must take on a steady speed and the usage of technology inside their organisation or institution. Those who want to be leaders must also be careful since there is a degree of a number of failures in the

theoretical change model. Those who practice technology instructional leadership may fail where they did not adjust quickly enough and to the pace at which change is taking place. All technological leaders must also ensure that they do not sacrifice objectives of their position or institutions where changes they pursue are just development and not the correct and compelling utilization of technology. The path-goal theory by (Northhouse, 2010) was utilized in this study. This theory states that any leader, in order to be successful, must rally all other resourceful persons to focus specifically on organisational goals and not anything else (Northhouse, 2010). Therefore, leaders must understand the best paths that must be followed to continue with a focus to organisational goals and efficiently avoid all barriers that may hinder the realization of this focus (Northhouse, 2010). This theory was useful to this study where school leaders can use it to guide in the technological leadership in schools. Since a technology leader within school environment demonstrates the ability to align school goals to technology. An educational technology leader must be able to oversee suitable and relevant technologies included in all aspects of classroom activities. The leader must encourage all the main stakeholders, such as teachers, to improve on their technology inclusion in instructional practices. Such leaders are responsible for helping each teacher to include technological approaches, as this may have a greater impact on the whole institution. Using the path-goal theory, school leaders can tech training and system support to help teachers in applying technological approaches in the classrooms. These leaders must therefore, demonstrate their multiple roles including as a manager, leader, tutor, mentor and a coach among others; and must work hand in hand with others.

In complementing the weaknesses of the above theories and models, the study used technology integration models called the technological pedagogical content knowledge (TPCK) by (Mishra & Koehler, 2006). This model states that effective technological integration needs the content how one teaches and the way one teaches technology and how technology alignment is done, type of technology used in classroom, all these should enhance building of technological integration mastery referred to as technological pedagogical content knowledge (Mishra & Koehler, 2006). Without technology, content, or pedagogy understanding, the leader will become ineffective in having adequate knowledge suitable to support technology teaching implementation. It implies that where a leader or a teacher has mastery of technological resources and adequate teaching content competence, yet without relevant pedagogy fundamentals, then effective knowledge to adequately teach their subject in a contemporary education. This model is useful in assessing teachers based on their technological pedagogical content and knowledge mastery. According to Hofer and Swan (2006) TPCK is helpful in assessing effectiveness of school teachers in various technological aspects including using student video activites in social studies and English classes, an indication of translating contetnt to suit all subject areas.

By exhibiting the necessities of study all teachers must to viably coordinate innovation into their instructing, TPCK additionally fills in as a model by which innovation school principals can see and assess powerful instructing. Another helpful model, known as the all-encompassing model, looks at innovation reconciliation as the appropriation of advancement inside an instructive association (Dooley, 1999). This model differences high paces of innovation dispersion with low paces of dissemination, and furthermore takes note

of the effect of a few factors, for example, the authority of the head and innovation coaches on those clients who actualize change (Dooley, 1999). This model aides effectively clarify why a few people inside an association effectively adjust to new innovation while others neglect to execute a similar innovation, as it requires a reconciliation approach that includes both preparing and administering (Dooley, 1999).

Other than the more conventional talks on parts of initiative, for example, the function of the leader, required aptitudes, hypothetical structures, and models, there are different roads of thought on authority that might be invaluable for appropriation by innovation school principals. Two extra factors for fruitful initiative are the utilization of an ethical basic as an administration objective and the social enthusiastic familiarity with an innovator according to their partners. Fullan (2001) upheld the utilization of an ethical reason for school principals as an approach to both arrange their objectives and to spur their devotees. Fullan (2001) likewise gives an ethical basic material to instructive innovation school principals when he expresses, a significant end is to have any kind of effect in the lives of learners. Along these lines, school principals in training can spike their adherents without hesitation by persuading them towards enhancements in their learner populaces.

This objective of learner accomplishment can be set in wording identified with innovation administration in instruction; the usage of innovation can be set in the point of view of improving learner execution. Likewise, this ethical basic can be applied to all activities of

the innovation chief, not simply those activities straightforwardly including learner learning. For instance, activities, for example, giving proficient improvement on innovation to educators or utilizing innovation to help instructors in reviewing, exercise arranging, or homeroom the board can be seen inside an ethical point of view of accommodating more successful guidance through an interest in educators. Giving an ethical reason likewise takes into account agreement and backing from others, which just serves to profit the objectives of any leader. By tying their promotion of innovation and their activities relating to mix to a typical focal objective of learner execution, instructive innovation school principals can utilize an ethical reason to convince others to their motivation. What's more, any compelling leader must know about the social and enthusiastic repercussions of their activities. For instance, when managing innovation execution, innovation school principals may confront differences from the individuals who feel undermined, overpowered, or mistook when looked for the selection of new innovation. The individuals who have negative feelings or contradictions towards a leader's activities or objectives will set up physical and passionate obstructions to the leader's aspirations.

Therefore, the connection among school principals and their consciousness of the feelings of those in their association or influenced by their approaches is a significant factor in objective accomplishment. Goleman, Boyatzis, and McKee (2002) examine the passionate knowledge of a leader and note: "Under the direction of an EI leader, individuals feel a common solace level. They share thoughts, gain from each other, settle on choices cooperatively, and complete things. Goleman, Boyatzis, and McKee (2002) further characterize four parts for compelling enthusiastic initiative and the advancement of

passionate insight as mindfulness, self-administration, social mindfulness, and relationship the board. For the instructive innovation leader, zeroing in on monitoring the aggregate sensations of an association in light of any administration activity, for example, the reception and utilization of new innovation, permits the leader to react and assuage any worries. In the event that instructors can sincerely acknowledge a similar mechanical support advanced by the instructive innovation leader, at that point there is more space and open door for activity and activity on the leader's part. On the off chance that people's passionate concerns are not met, at that point a leader might be not able to show any drive, show change, or respond to outside change, as no leader can really act alone.

The Complete Educational Technology Leader Having inspected a few territories of figured; one would now be able to have a more complete perspective on the instructive innovation leader and a few key components identifying with their viability. In the first place, the instructive innovation leader is a person who advances the mix of innovation in an educational system with the ethical basic of improving the learning of learners. The improvement of the learning climate through innovation can be accomplished through an attention on the necessities of instructors or learners. In particular, we can see the instructive innovation leader through a hypothetical system of way objective hypothesis, wherein the innovation chief must help instructors in the authoritative objective of innovation incorporation. Instructive innovation school principals additionally require a more significant level of specialized mastery than different school principals, as they should know about both the rise of new innovation and the methods by which it can emphatically influence learner scholarly accomplishment. For instance, specialized

information on models for innovation incorporation may serve instructive innovation school principals.

The TPCK model gives a system by which technologists can assess their endeavors concerning the viable reconciliation of innovation inside a learning climate. While TPCK gives a model to innovation mix inside the classroom, the all-encompassing model serves innovation school principals by giving an attention to the variables that lead to effective selection of innovation inside an association. Moreover, one ought to likewise see the administration segment of an instructive innovation leader as a place that requires information on the change cycle. This aptitude in association change likewise incorporates the capacity to control an association through the unendingly changing field of innovation.

At last, similar to all really powerful school principals, instructive innovation school principals should know about and change their initiative style to oblige certain variables that can affect their own exhibition as a leader. In particular, instructive innovation school principals would profit by administration rehearses that characterize a reasonable good reason, for example, associating innovation to class improvement or learner accomplishment. Also, an emphasis on the passionate parts of driving can help the innovation chief in convincing others to receive new innovation and fabricate coordinated effort inside an association.

Assuming that an instructive innovation leader is knowledgeable in the previously mentioned standards and hypotheses of innovation administration, one would anticipate

that those school principals with such aptitude should have a huge effect on their field. In fact, instructive innovation school principals can and have made solid commitments to the domain of training. For instance, scientists have discovered that instructive innovation school principals, explicitly those in positions, for example, a school level instructive technologist or an innovation organizer, are solid supporters for the further utilization of innovation and have huge impact in how a school's chief methodologies and utilizations innovation (Bangolu, 2011). These discoveries likewise help uphold the hypothesis that innovation authority requires a lot of ability, as it is demonstrated that the innovation organizer, and not the head, is regularly the essential troublemaker of innovation coordination in the homeroom (Bangolu, 2011).

In any case, to really increase a point of view on the effect of current administration and any activities inside people in the future of instructive technologists, one ought to look at the commitments of instructive technologists on present ways to deal with schooling. As the objective of an instructive technologist is to coordinate innovation in the classroom with an end goal to expand learner learning, one ought to look at their nonstop work and progress inside the field. Accordingly, instructive innovation school principals are liable for a few territories of development inside the instructive field. These activities have significantly affected the manner in which instructors as of now teach their learners; these activities merit a diagram in any conversation of innovation initiative and the impacts it has had on the field of training.

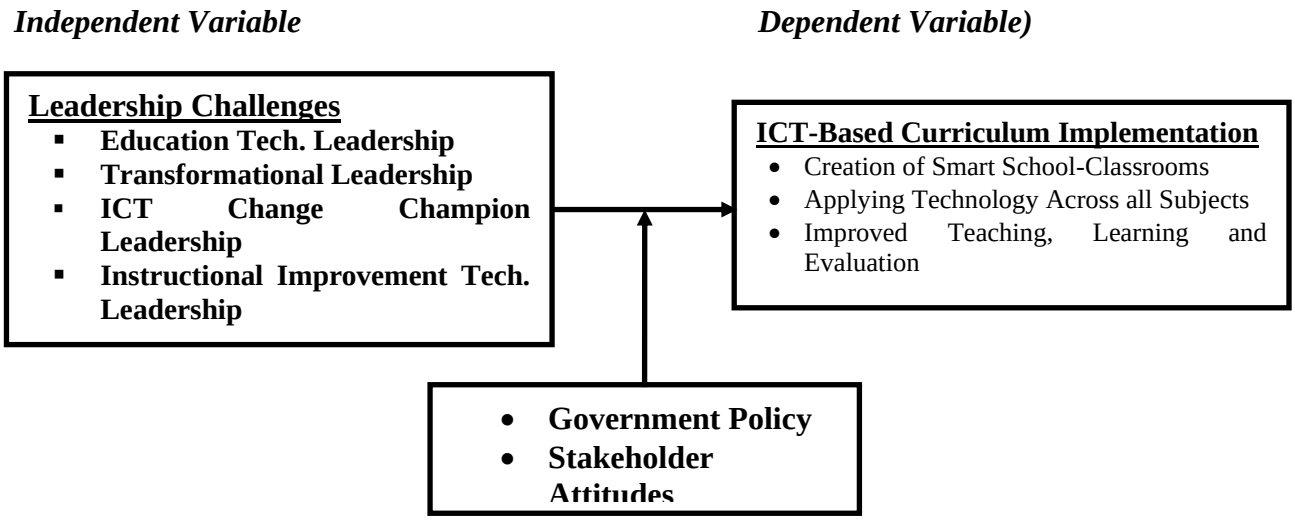
The other guide, the Model of ICT Implementation measure depends on authoritative change, advancement and mechanical dispersion. The reason for the model is to offer a coordinating and arranging structure for ICT usage. The model involves six phases, to be specific: inception, authoritative appropriation, variation, acknowledgment and reception, routinization and imbuement. Subsequently, the model covers an execution cycle from checking the authoritative requirements to a full and successful utilization of the innovation in every day practice. The model additionally recognizes five logical variables which sway on cycles and items in every usage stage: instructive innovation authority, groundbreaking administration, instructional initiative, and ICT change readiness administration and (Cooper and Zmud, 1990).

1.11 Conceptual Framework

This conceptual framework followed the concept of ICT based curriculum implementation that focuses on four major elements in order to create smart school-classrooms, apply technology across all subjects and improve teaching, learning and evaluation in secondary schools in Kenya to enhance learners ICT innovative and creative competencies. These elements include ICT aided instruction, ICT based education, instructional technology, tech integration, developing pedagogical indicators, utilisation indicators, and outcome indicators. This is within the paradigm shift of a focus from mere devices availability, teacher skills an competent to value use of ICT in curriculum implementation and encouraging dissemination and collaborating with initiators. It is recognized that education system that is tech integrated in curriculum develops secondary schools graduates who are prepared to compete globally in innovation and creativity challenge becoming the

fundamental to a country's economic development success. Yet in situations where there is lack of ICT based curriculum; there may be lack of digital literacy and significantly deny graduates competitiveness in ICT related knowledge development, then the worst would be anticipated (Ketschau, 2017). This implies that when school leadership is hardly able to implement ICT based curriculum in their schools, then it cannot build student graduates for high desired economic prosperity such as vision 2030.

Historically, school principals have been recognized as critical to influence the direction of policy and any other reforms implementation effectively in their schools. Although it is recognized that school principals are critical element of implementation of any reform agenda in learning institutions, it has not adapted and integrated itself to fit in the ICT inclusion in the curriculum design, development and implementation. Hence the topic of leadership challenges Secondry School principals experience when implementing ICT-based curriculum and instructions in secondary schools in Elgeyo Marakwet County, Kenya.



Intervening Variable

Figure 1.1: The Conceptual Framework of Graphical View of Variables

(Source: Author's 2020)

Figure 1.1 demonstrates the graphivcal view of how the variables are related or can interact.

The variables represented here include the independent variables represented by School Principal Leadership Challenges which is further subdiveide into components that include: educational technological leadership, transformational leadership, instructional improvement technology leadership and ICT change agility leadership, which were explored to ascertain the which ways these components remain a challenge to the implementation of ICT-based curriculum in secondary school. These components were explored further to establish their possible areas in which it is difficult for schools to make use of them. The conceptual framework pursued these components with a foucs on ineervening variables. Moreover, the dependent variable was ICT-Based Curriculum Implementtion.

In the Figure 1.1; the interaction between the variables are shown. The educational technology leadership should provide a technological roadmap that guides the ICT implementation process; the school leadership must therefore be ready and instrumental in assisting, supporting, coaching, mentoring and training teachers and learners on various aspects of technology for learning and non learning activities. As for transformational technology leadership, the schools need to transform its human resource into expert of

teams that understand not only being cometent or skilled but to also knopw-hopw about technology use, among other reasons. This can be utilized through the use of instructional improvement technology leaderships, and ICT change agility leadership, technology leaderships must go beyond mere offering machines or devices for a contemporary learner-centered education. These leadership must deliver authoritative technology enabled curriculum that supports content translation and school transformation to accommodate all subjects of secondary eduction curriculum though technology.

1.12Operational Definition of Terms

Leadership Challenges- leadership competencies that are lacking or available but noit easy to apply in solving problems that are under the roles and responsibilities of an individual with functional designation to discharge those roles and responsibilities.

Educational Technology Leadership-Ability to identify technology that are adoptable, implementable suitable and relevant to a specific local school needs and organizing them into useful form for ready use by all

Transformational Leadership- competencies needed to identify the needed reforms, creates a vision to guide those reforms, deelop capable manpower through inspiration and enable the reform execution with the commitment of the members for example Principal and the school personnel

Instructional Improvement Leadership- capabilities that enable the translation of conventional education into contemporary eduation practices.

ICT Change Agility Leadership- A leadership capability to interpret the ICT trends and quickly respond and avoid acquiring technologies that are soon becoming redundant or obsolete hence not wasting school resources

ICT Based Curriculum- Enhanced Curriculum with a focus to ICT application in creating the end results not a subject of learning

ICT Based Curriculum Implementation- involves all the activities inscribed in school teaching and learning system to ensure that all aspects of curriculum.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter reviewed different past study literature and establish the strength and weaknesses of literature reviewed in relation to the topic that was investigated. The literature reviewed were mainly from the areas of ICT implementation in secondary schools, the areas where literature widely agree or disagree and the knowledge gap that was not bridged from the findings of the revewed literature.

2.2 Review of Literature

Research has recognised that the effective executing technology based curriculum enhances teachers and learners capabilities in to cover varied areas including science and non-science subjects. The studies identified specific mathematic areas that needed graphical and motion content including binary, graph interpretation, and logarithm. This is said to enhance learners' digestion of mathematical content or knowledge. The use of graphical inclusion also helps in improving learner understanding of poetry reading, essay comprehension and literature genres among others thereby promoting interest development among different subjects. However, these researches are yet unanimously develop findings that enable learning institutions to apply ICT in helping simplify instructional methodologies for all secondary school curriculum subject areas. Yet the findings of these studies argue that only having ICT devices for instructional purposes can improve suitable classroom interactions. According to Nwite (2007) in classroom communication process, what learners visualize influences their behaviours and hence interaction is effective in enhancing and achieving

this drive. It means that when improving learner interest, technologies that aere interactive in nature should be implemented.

Further on, more studies still indicate that application of technology in education system to deliver much discussed benefits does not automatically generate that. While there are those proponents of ICT who believe that its application is all beneficial to education system; there are also those who believe that ICT is a mere teaching aid that does not add value to education, and in any case there is improvements, then such improvement may not be directly traced to ICT used. This arm of researchers argues that ICT does not automatically deliver much discussed benefits. This creates practical implementation challenge to the implementers; moreover, it presents academic knowledge gaps that require leadership solution. Moreover, in their findings, they argue that input resources though important but the role of a teacher remain fundamental to all. Teacher quality and teching quality all influence the instructional achievements.

But still research findings indicate that the present global educational system, especially in the developing countries, is at its low level still struggling to make real PC training courses into its educational plan which is as yet a battle for most government claimed schools. The motivation behind ICT in the instructive educational plan is improving the learning cycle through the association of assets materials and the develop brains of the instructors and the course substance of the educational plan. As indicated by Nwite (2007), Advance and created nations have validated the way that ICT is a focal point of instructive approaches for use and joining in the school educational program. Oxford progressed students' word

reference of contemporary English language characterizes correspondence and the action or cycle of communicating thoughts or sentiments while data and correspondence innovation (ICT) is characterized as the utilization of electronic gear particularly PCs for the putting away, breaking down and conveying of information(Hornby, 2001).

According to UNESCO (2017) schools must be equipped in a number of ways to deal with the ramifications of special needs cases. ICT have the potential to transform special needs children's learning experiences from one of negligence to a robust and complete learning experience. To transform the learning experience of special needs students, Mishra, Sharma and Tripathi (2010) describes a range of specialised technological devices and components that are useful to offer educational solutions including communication and availing and accessing learning materials. Some of these technological components may be helpful in assisting special case students including specialised keyboards, Braille, Conversion of local language content to Braille and other form of specialized learning, screen readers, touch screens, eye tracking, talking word processors, and screen magnifiers.

School principals play critical role in interpreting and implementing educational policies. Different governments have initiated reforms that are given to school principals to interpret and implement. According to Sayed and Jansen (2001) school principals assume a significant function in deciphering the instructive approaches all in all just as strategy reports for the educational program, and hence their insight is indispensable. It implies that regarding conveying these approaches and records for top to bottom agreement in improving down to earth use, school chiefs are additionally basic. As indicated by Smit

(2001), enactment and correspondence of arrangements for instructive change rely upon what instructors "think" and do just as their own manner and emotions concerning change or strategies proposing change. The way they intervene and follow up on approach for instructive change proposition impacts the possible impacts.

It means that in the process of arranging for the execution of curriculum reforms, the principals who assume leadership roles must be able to devise approaches for technology implementation. Studies reveal that even in schools with adequate technology and non technological resources continue to experience low ICT implementation. This means that even though these resoruces which include human, financial and technological devices and infrastructure are prerequisite for effective process, they do not automatically translate to desired technoglogical transformation (Mafora and Phorabatho, 2013). This has been one of the drivers for failures in implementation plans of curriculum reforms. It gives school principals the responsibilities for organizing, coordinating cotrolling managand leading school activities and aligning them to instructional practices. These principals need competencies critical to the educational innovation in order to enhnce curriculum execution management. This enables them to understand ICT knowledge, skills and attitude needed by their schools. But given the level of poor implementation of ICT in school curriculums; it is an indicator that school principals have not been able to provide this direction. School practices and education represent practices with multiple and diversified stakeholders, relationships, and opinions including challenging and influencing matters of great concern (Salavati, 2013). Moreover, the difficulty of contemporary education demand comes from multiple sources. So schools are required to infuse and apply technologies both digital and

non-digital in schools. In Sweden, although the number of technological components such as interactive whiteboards, use of tablet devices, private devices of learners for education and teachers private computer and the digital technologies application in classrooms increased but still various studies in Sweden reveal that digital technologies for education have been limited and highly scattered (Fomunyam, 2019; Crossman, 2019 and Salavati, 2016). The findings of these studies indicate that these technologies areactually applied in administrative tasks than supporting tools for instructional methodologies (Higgins, 2017; Ibenegbu, 2018 and Mavellas et. al., 2016). Moreover, most studies have focused on physical, financial and human aspects of technology implementation. Yet it is clear from most study findings that even if learning institutions have adequate fina ncial, physical and human resources, including teachers who are skilled and competent still the implementation of technology has experienced difficulties. These have made most schools in many countries lag behind or are slow in implementing ICT into their curriculum. It means that there is need for learning institutions to come up with techniques of putting together the available resources, transform and or translate the situations into ICT application in classrooms. It means that school principals with great leadership competencies should tranfoirm the available resources including teachers posted in their schools into a team of experts capable of delivering ICT curriculum reforms.

According to Van der Westhuizen (1991) there is a connection between's the degree of adequacy in the changing cycle and the capable contribution of the individual answerable for the change. Change isn't an occasion yet a cycle. Along these lines, chiefs need to design, create and keep up change progressively (Ngcongo, 2001). This is on the grounds

that it is progressively perceived that training arrangements from one nation, including ICT for learning and educating in the educational program, may not consequently be fit to the setting of another. This is a circumstance that requires authority in principle angles and ideas of ICT – based educational plan and not only executing what others have shown as valuable. This authority might be valuable in building up own answers or approaches dependent on top to bottom investigation of the nearby conditions and vital needs. Nonetheless, examines keep on demonstrating that there are numerous requirements that agricultural countries experience. These variables incorporate the accessibility of monetary and HR, and topographical separation, which may restrict their capacity to create, execute, and assess their own vital advancement plans.

However, most governments have invested large financial resources in the development of human capital, and allocation of financial resources to their education system including investment in digitizing government services (Aguyo, 2010). It means that there is something missing in between to convert the available resources into workable process towards achieving the desired ICT integration in education. This has seen ICT continue to remain as a subject to be selected by certain students and not a tool for simplifying teaching and learning (Andoh, 2012).

The blackboard and course books keep on overwhelming classrooms exercises in most Discetionary schools in agricultural nations. There is no uncertainty that in the current brutal monetary rivalry, the private area in Kenya has grasped ICT to remain above water.

The financial area, protection, producing ventures and global organizations in the oil area have grasped media innovation to carry creative answers for their present difficulties.

The useful use of ICT into educating and learning requires educators and students to split away from the boundaries of time, absence of certainty and protection from change (Becta, 2003). Educators and students both need to look up to the difficulties that will change the essence of customary instructing and realizing, which centers around the instructor's monopolistic exercises in class, to exercises that are more affected by students, address the necessities of individual students and join one-on-one instructional exercise rehearses (Cross, and Adam, 2007).

The investigations of innovation execution in the instruction and in the schools are an old writing since 1980s (Evoh, 2007). Numerous literary works led in Hong Kong (Yuen et al. 2003), South Africa (Dzidonu, 2010) and Australia (Amoo, 2002) have distinguished the accomplishment of ICT execution with their school authority, so it is conceivable that in a comparative climate, the school initiative owes ICT usage accomplishment to the school. In an examination by Yuen et al. (2003) it was discovered that school heads are needed to refresh their aptitudes and information, yet they additionally run after the change of their parts as instructive school principals. It is an apparatus of arranging and planning and usage of school-wide innovation program, including educational program improvement. At the point when ICT is actualized, it gets change instructing and learning and the usage of progress is between identified with the authority and the board of progress (Alexander, 2003). A few specialists of instructive innovation usage have noticed that huge numbers of

school administration have small comprehension of the connection between innovation fit and school execution and understudies result (Amoo, 2003a). This is a hole that isn't completely investigated and should be investigated.

Several factors influencing the adoption and Implementation of ICT into teaching have been identified by researchers. Rogers (2003) identified five technological characteristics or attributes that influence the decision to adopt an innovation. Andoh, (2012) also identified user characteristics, content characteristics, technological considerations, and organizational capacity as factors influencing ICT adoption and Implementation into teaching. Balanskat, Blamire, and Kafal, (2007) linked ICT Implementation with the idea of completeness, when all components of the framework are associated together to turn into an entirety. For example, the two significant components of educating and realizing which are substance and Instruction must be joined when innovation is utilized in exercise. In other manner, if understudies are offered arrangement of sites or ICT apparatuses (for instance CD ROMs, mixed media and others) at that point the instructor isn't actualizing ICT into educating since he/she isn't handling the Instructional issues. ICT Implementation is the methods for utilizing any ICT device (Internet, e-learning advancements, CD ROMs) to help instructing and learning in instructional institution (Becta, 2003). A few variables affecting the reception and Implementation of ICT into educating have been recognized by specialists. Rogers (2003) recognized five mechanical qualities or traits that impact the choice to embrace a development. Andoh, (2012) additionally distinguished client qualities, content attributes, innovative contemplations, and authoritative limit as components affecting ICT selection and Implementation into educating. Balanskat, Blamire and Kefalla

(2007) distinguished the variables as instructor level, school-level and framework level. Instructors' Implementation of ICT into educating is additionally affected by authoritative components, perspectives towards innovation and different elements (Cross, and Adam, 2007). Sherry and Gibson (2002) guarantee that innovative, individual, hierarchical, and institutional variables should be viewed as while analyzing ICT reception and execution.

Neyland (2011), factors, for example, institutional help just as miniature factors, for example, instructor capacity affecting the utilization of internet learning in secondary schools in Sydney. This article audits concentrates on the utilization of ICT by educators and recognize factors that included and arranged in the structure of Sherry and Gibson (2002).

ICT in learning and instructing alludes to the utilization of ICT in encouraging educating and learning cycles to address the difficulties of the 21st century. Meeting these relies upon the early Implementation of ICT into learning and staying up with the latest on the utilization and use of ICT in learning and instructing. The Education Department has demonstrated the significance of executing ICT into schooling (Sherry, Billig, Tavalin, and Gibson, 2000). The presentation of ICT in instruction speaks to a significant piece of government's procedure to improve the nature of learning and instructing over the schooling and preparing conditions. The's arrangement will probably zero in on learning and instructing for another age of youngsters who are experiencing childhood in a computerized world and are OK with innovation and all schools ought to mirror these real factors.

Regardless of the arrangements and great intension of actualizing ICT into school, there is dissimilarity in the usage of ICT in South Africa schools. As indicated by the Department of Education's White Paper (2003), there are even in excess of 19 000 schools without PCs for instructing and learning. All things considered, there is an improvement in the Eastern Cape detailed the most un-number of PCs in schools and the utilization of PCs for educating and learning at schools. The White Paper announced that variations reflected in South African culture additionally discover articulation in ICT Implementation into instruction, despite the fact that the quantity of schools with PCs for educating and taking in has expanded from 12.3% in 1999 to 26.5% in 2002. As per the Department of Education's White Paper (2003), unmistakably it is hard to accumulate an ICT profile for South African schools. Measurements are affected by different components, including the quick excess rate and the degree of utilization and the sharing of ICT assets.

The conventional parts of the school school principals fluctuate broadly from strategy usage and checking to planning and advertising. As school principals at the public office level advance toward a model of instructional initiative, their jobs can change drastically. While customary duties actually should be met, needs should be moving toward instructional issues that will affect classroom guidance and understudy accomplishment. A portion of those components incorporate advancing a dream; making ICT arrangement of educational program, guidance, appraisal, and norms; zeroing in on information; and keeping up a culture of constant learning (Lashway, 2002).

The school principals realize they are answerable for making vision and establishing the pace for this change. They have become champions for this significant activity. Their vision and center have set the need for the school principals at the school and classroom levels. The educational program school principals along these lines must have a strong comprehension of what their schools need as far as ICT substance and instruments just as demeanor and view of implementers, and the school principals have a reasonable arrangement to give preparing to other locale school principals whose work associates with the usage of the award. At whatever point conceivable, they go to proficient advancement meetings in which perusing improvement is the core interest. The school principals need to meet consistently with instructors and different partners to share progress made toward the objectives. They likewise guarantee that contending activities don't meddle with the current focal point of progress.

School administrators and instructors need to create aptitudes identified with the learning settings that adjustments in educating and learning ideal models require. Along these lines, their job is increased and moves from being a solitary transmitter of information to become facilitator and guide of the learning cycle, integrator of new ICT media, analyst and fashioner of reasonable learning situations, teammate (with different educators and understudies), orchestrator, student and evaluator just as influencer of progress. An examination done by Seng Chee Tan, (2010) discovered that school chiefs assume a significant function in giving a foundation that is helpful for the utilization of instructive advances. Such administration is knowledgeable about the arrangement of framework

evenhanded to all staff and understudies, instead of to a chose gathering of individuals (Yee, 2000).

As Gisbert (2001) brings up, the educator's part in ICT-based learning settings isn't simple, it is urgent that they obtain guidance with respect to the plan and usage on-line courses, the coordination of ICT/Web-based instructional cycles and the advancement of the board aptitudes. Continuous instructor preparing along with the production of appropriate instructional spaces gets central to empower educators to actualize effectively ICT in their instructing and gets simultaneously basic to arrive at a serious level of value sooner rather than later instructing measures. Innovation school principals in schools recognize their parts in improving understudy learning results and instructional quality using advances (Schiller, 2002; Yee, 2000). For instance, "learning-centered imagining" and "gutsy learning" were distinguished as significant parts of school school principals (Yee, 2000). School school principals demonstrated that understudy learning should be the principle center for dynamic identified with ICT strategies in schools and instructors should be urged to analyze (courageous learning) with the utilization of advances in guidance. Utilizing progressive straight demonstrating, Marks and Printy (2003) found that lone when groundbreaking initiative is coordinated with instructional administration, there is significant effect on instructional nature of educating and understudy accomplishment. At the end of the day, while school principals can fabricate association limit through change administration, just when instructional initiative is shown by the school principals, the individual ability of educators and understudies can be upgraded. Be that as it may, this would not manage any natural products without mechanical authority.

These study findiongs reveal some best practices for instructing and learning demonstrates uncovers that school administrators are a key to continued innovation execution in any school classrooms. Also, the school administrators appear to be significant turns that can change and lead the educators' ICT abilities improvement and the application in their schools including acknowledgment of the innovative change. Nonetheless, an investigation by Rossafri and Balakrishnan, (2007), discovered that that the majority of these school chiefs are at the lower end regarding the information and aptitudes identified with ICT applications and are normally very awkward with regards to innovation and groundbreaking initiative. This thusly makes them least capable as innovation and groundbreaking school principals. These school chiefs should know about their functions as innovation school principals. Expectation and Stakenas (1999) proposed three essential parts for the head as innovation school principals: good example, instructional leader, and visionary. Ritchie (1996) in talking about the part of the executive in innovation usage expresses that chiefs must prepare their educators to make an innovation culture.

In yet another study by Yee (2000) found that the schools that utilized ICT in the most helpful manner were those where the administrators shared an unflinching vision that ICT could improve understudy learning. These administrators additionally depicted energetic promise to giving groundbreaking authority and expertly creating educators to upgrade their teachers'ICT abilities and information. Schiller (2000), then again, features supporting innovation, and encouraging change and intercession techniques in the instructing and learning measure as the key jobs that the chiefs must play. Schools with the most noteworthy innovation utilize shared the trait of solid, eager school principals supporting

their feelings about innovation by apportioning assets and planning proficient advancement in ICT for their instructors (Stegall, 1998). Successful chiefs should be effectively associated with innovation, including demonstrating the innovation use and assisting with actualizing progressing educational program incorporated innovation staff improvement. They must be effectively included by getting innovation abilities on the most proficient method to work and utilize it at whatever point they need to speak with others. Moreover, they need to build up a dream for the school, a setting for innovation in the school to enable instructors and assist understudies with turning out to be more innovation proficient (Brockmeier, Sermon, and Hope, 2005). All together for fruitful usage of ICT applications among instructors, Macneil and Delafield (1998) remarked that chiefs need to utilize their current assets admirably and inventively.

They should think outside the box'and they should think in a liquid climate. Regularly, educators are discovered to relate their presentation to the initiative of their schools. The administrators' order of innovation is significant in settling on educated innovation choices. A primary who is ICT educated is more mindful of the staff individuals' necessities. The chief is answerable for dealing with the assets essential for innovation mix. At the point when they see a decent initiative from their school principals, they appear to be effectively engaged with the projects that are created by the authority to upgrade their ICT aptitudes. All in all, they attempt to copy their good examples who can be their own chiefs (Sathiamoorthy, 2002). In her meetings with administrators, Kozloski (2006) found that huge numbers of them advocate that displaying is probably the most ideal approaches to show educators to take cues from them in innovation, however at times the instructors don't

have similar point of view as the school principals do in their utilization of ICT applications. Likewise by being innovation school principals, the school administrators must guarantee that instructors get sufficient expert turn of events, specialized help, and assets to understand the mechanical advantages for their utilization in the classrooms.

School principals who are capable should investigate different ways for securing innovation assets including raising support, government, and association for award and business, cooperation and systems administration. The future utilization of ICT in schools will be viewed as an undeniably regular apparatus for the upgrade of understudies' acumen, correspondence and coordinated effort. Chiefs ought to have reasonable, specialized abilities, etc. If there should be an occurrence of schools, chiefs are school principals. Administrators have instructors who serve under the authority of chiefs. Devotees of head (Leader) are educators and other staff. Chiefs can have the right stuff of ICT or they can attempt to have these abilities. Moreover, for executing any valuable angle in association, top administration uphold is an unquestionable requirement without top administration uphold; ICT can't be utilized for educating and learning in schools today, ICT become imperative. Innovation is changing every day

Since there are numerous parts of innovation school principals, a few specialists started to inspect the essential skills of innovation school principals. Eight significant information, aptitude and characteristic regions recognized as significant for ICT school principals incorporate initiative and visioning; learning and instructing; efficiency and expert practice; backing, the board and activities; appraisal and assessment; information on critical thinking

and data advances; social, lawful, and moral issues; authoritative relations and interchanges. School level innovation school principals share a comparative rundown of information, aptitude and characteristic zones aside from information on critical thinking and data advances and authoritative relations and correspondences. An investigation by Chang, (2003) distinguished four elements of innovation administration abilities: vision, arranging, and the board; staff improvement and preparing; innovation and framework uphold; assessment, exploration and appraisal of staff. Furthermore, a decent innovation leader must have great relational and relational abilities.

Further research by Seong and Ho (2012), demonstrated that the way toward actualizing an instructional change including the utilization of ICT required an educational program and instructional initiative among the senior administration (head or superintendent) and center administration (head of division or Level Head). This is fundamental as the help of top administration for ICT execution in educational plan and guidance might be conceivable when the top administration is included. Together, they executed a blend of groundbreaking administration (performed by senior administration) and instructional authority (performed by the center administration) to build up educators' ability for an upgraded ICT guidance. Besides, a passionate administration was likewise needed to help teachers and leareners work to change, and a vital administration of assets was fundamental to continue educators' change endeavors.

For ICT usage, advancement and configuration to occur at the degree of an individual school, there is a requirement for improvement in school initiative and association

essentially on the grounds that educators are normally impervious to major hierarchical changes and developments (Dimmock and Goh, 2011). This investigation endeavored to correct the methodologies for school pioneers to interface ICT usage in schools with the teachers.

2.2.1 Educational Technology Leadership

This is a drive towards advancing incorporation of innovation in an educational system with the ethical basic of improving the instructing and learning measure. The improvement of the educating and learning climate through innovation can be accomplished through an attention on the necessities of instructors and understudies. It implies that there is basic need to give positions of authority in improving instructing and learning through the use of instructive innovations utilized in schools, advanced education establishments, enterprises, associations, affiliations, governments and establishments.

In schooling framework, learning organizations show helpless degree of introduction and use of programming and equipment frameworks over all the subjects. Also, these establishments don't have dependable academic ICT pointers, ICT use 9indicators and ICT result markers subsequently making assessment of sound instructive innovation programming and execution plans troublesome. In this way the capacity to figure out how to apply the hypotheses, standards, models, devices and procedures related with authority, including strategy making, and how to coordinate them into the instructive innovation climate become a challenge.

ICT fitness is characterized as having the option to deal with a wide scope of changing ICT incorporated directions and applications for different purposes (Nwana, 2008b). The educators' PC Technological Leadership is a significant indicator of executing ICT educational program in instructing and learning (Berner, 2003). Of those educators who report negative or impartial demeanor towards the execution of ICT into instructing and learning measures many need information and abilities that would permit them to settle on educated choice (Al-Oteawi, 2002; Bordbar, 2010).

The best test to the school initiative is the experience to be an ICT pioneer, school school principals, for example, the head, must be prepared in vision, arranging and the executives. This is the main establishment of innovative administration. An innovative pioneer must build up a dream of how school change will be influenced by innovation (Lau, and Sim, 2008). Arranging and building up assets for staff improvement are the main duties of a mechanical pioneer, trailed by ICT apparatuses and foundation backing and assessment and examination. Viable innovative pioneers must manage systems for estimating the development of every individual educator.

It is perceived that innovation has a huge number of employments and advantages in such different territories as expert turn of events, educational plan alterations, distance learning, and the instructing of abilities important to have a fruitful vocation in our mechanically coordinated world. It implies that there is need for instructive innovation pioneers going about as solid backers, in distinguishing just helpful advancements that are implementable in their learning organizations. In any case the field of training would be not able to

effectively incorporate and successfully execute innovation into an educational system, nearby school site, or homeroom. Along these lines, to receive the rewards of innovation, there is a requirement for master people to accept positions of authority and advance innovation for instructive purposes.

Makhanu, (2010) additionally depicts ICTs as advances that are utilized to make, oversee, convey and disseminate data. As per Laaria, (2013) ICTs incorporates phones, TVs, radios, PCs, web and general media supplies. Makhanu, (2010) note that ICT is any application and gadget used to oversee, access, make, assess, coordinate and convey data and information. The creator contends that advanced innovation is remembered for that definition. On the hand, Manduku, Kosgey, and Sang, (2012) saw that ICT equipment incorporates personal computers, CD drive, PC, phone (landline and versatile) power framework, scanner, printer and projector. Khan et al, (2012) depicts programming as definite guidelines (projects) and information that empower equipment to play out its undertakings at rapid.

As indicated by Makhanu, (2010) ICT usage includes utilization of innovation as a device to investigate, assess, plan, arrange and impart data. Menjo and Boit, (2012) noticed that execution of ICT in schools includes the degree to which instructors use PCs, interactive media projectors, overhead projectors and other innovation apparatuses in their day today exercises. Moreover, the degree of ICT execution in schools is commonly reliable with the degree of financial turn of events. The creator contends that usage of ICT includes real selection and utilization of ICT devices in managerial errands and it includes utilizing

Internet innovation and PCs to improve the nature of educating, learning and school the executives.

New advances have changed instructing and learning in various manners from diagramming adding machines to online exercise plans to virtual field trips and reenacted analyzations, instructive advances can assist understudies' with getting to content in new and regularly energizing manners. Truth be told, one would be unable to locate a solitary school that doesn't approach some sort of instructive innovation. As per overviews, the same number of as 95% of schools are associated with the Internet; even at the degree of the individual homeroom, association is close to as all inclusive near 75% of classrooms in the United States have Internet access. In spite of this almost universal admittance to PC innovation, in any case, there is a huge hole between the presence of innovation and its utilization in the classroom. While some sort of innovation is available in practically every classroom in the nation, it is seldom used to its fullest potential (Royer, 2002).

A portion of this disparity is because of an absence of solace with utilizing innovation for educating and learning. Indeed, even instructors who are utilizing innovation and report a serious level of solace with innovation will in general utilize it in genuinely unbending ways, for example, looking for exercises to use with understudies, speaking with different educators, and word preparing (Nwana, 2009a). And keeping in mind that understudies habitually use PCs in the homeroom, use is frequently restricted to data assembling and word preparing instead of utilizing media devices or advanced substance to plan and make

items (Nwana, 2009a). Frequently, learning with innovation is instructor focused instead of understudy focused.

Instructive technologists have a large number of duties put upon them as they are regularly assigned as the essential instructive innovation pioneer inside an instructive climate. The job that these pioneers serve is best spoken to by the way that powerful innovation administration is characterized and introduced inside the writing of the field. The part of an instructive innovation pioneer inside a school is a remarkable function in contrast with that of fundamental authoritative administration. For instance, it very well may be required of all pioneers to be answerable for, as Schrum and Levin (2009) state, changing the way of life of a school. Notwithstanding, an innovation chief has a further characterized function from that of an overall school pioneer or overseer. Schrum and Levin (2009) examine the part of the instructive innovation pioneer as one who coordinates current innovation zeroed in on joint effort, for example, wikis and online conversations, into the school and its particular classrooms.

Subsequently one can see that an innovation chief has a more engaged and regularly requesting function inside the school; they should constantly modernize the school regarding its ownership of innovation assets and all the more critically the utilization of those advancements for the objective of improved, current guidance. Given that writing discoveries show that poor ICT use in many schools across creating world, it means that insufficient or absence of training to such authority. In any case, this job isn't to be messed with, and must be satisfied by people who not just comprehend and establish viable

standards of administration, yet in addition have a working information on innovation and its homeroom use. Having characterized the essential part of an instructive innovation pioneer, to coordinate innovation into the classroom, one must inspect the aptitudes needed to be an innovator in this consistently evolving field. Instructive innovation pioneers are in a novel position and as such require an emphasis on two arrangements of abilities: authoritative initiative aptitudes and abilities identified with the utilization of innovation.

One structure for survey the necessary abilities of an instructive innovation pioneer is given by Northhouse (2010) and is drawn from past work known as the three-aptitude approach (Katz, 1955). In this model, compelling pioneers are characterized as zeroing in on three expertise territories, known as specialized abilities, human aptitudes, and applied abilities, in different sums dependent on their situation inside an association (Northhouse, 2010). In applying this reasonable system from Northhouse (2010) and Katz (1955) to our investigations on instructive innovation, one can Educational Technology: Effective Leadership and Current Initiatives 5 expect that while innovation pioneers must be equipped as far as human and theoretical abilities, the essential focal point of an innovation chief is on specialized aptitudes. Along these lines, as a prime condition for being a viable promoter of innovation inside an association, that individual must know about the current innovation and abilities important to show and display the compelling utilization of innovation. On account of a nearby school site, an innovation chief must have a huge information base of valuable advancements to attract upon to tackle explicit issues, for example, giving educators proficient turn of events or utilizing innovation to improve classroom guidance

2.2.2 Transformational Leadership

Groundbreaking school authority is a kind of school administration style that prompts positive changes in school staff and understudies. Groundbreaking school pioneers are normally dynamic, energetic and eager. These pioneers are concerned and associated with the way toward actualizing ICT just as helping all school individuals understand the fantasies of ICT. Groundbreaking school pioneer representatives' obligation, shares dynamic, advances staff proficient turn of events and keeps up a reasonable vision in school. This pioneer is equipped for affecting others by adjusting ICT vision to estimations of the school.

ICT selection is the choices that people make each time that they think about taking up a development. This selection is the choice an individual make to utilize an advancement as the best strategy accessible (Rogers, 2003). The cycle of selection begins with introductory catching wind of a development to definite appropriation. With the end goal of this investigation, Rogers' meaning of reception is utilized (Rogers, 2003).

Usage is the cycles and choices made by people each time they consider receiving advancement (Andoh, 2012). Simultaneously, Khan, Hassan and Clement, (2012) depicts usage of ICT in schools as the choice made by school pioneers and educators to utilize innovation as the best game-plan accessible. Andoh, (2012) sees that the cycle of usage of ICT begins with starting catching wind of the innovation to conclusive selection and utilizing it. While numerous educators actually feel awkward utilizing innovation in their showing practice, all things considered, instructors feel new advancements are doubtful in

the homeroom (Royer, 2002). In spite of the fact that there has been a lot of examination on the viability of innovation devices for educating and learning, a significant number of these investigations may not make an interpretation of well to the truth of the homeroom (Wallace, Blase, Fixsen, and Naoom, 2007). Schools may end up stuck in a progression of starting execution endeavors, attempting one thing after another, and not accomplishing full usage of a program. Indeed, even top notch preparing, whenever utilized in disconnection, isn't adequate to prompt full-scale usage of innovation; for genuine innovation execution, educators need to accomplish more than just find out about another innovation device (Wallace et. al., 2007).

On the off chance that schools need educators to utilize innovation to upgrade understudy learning, at that point it is critical to address these issues. Educators are immersed with new activities consistently; novel thoughts travel every which way and are once in a while manageable (Zorfass, 2001). To maintain a strategic distance from "activity weakness," schools must zero in on presenting new innovation, yet additionally on actualizing and scaling up new advancements. While each school is extraordinary, with various requirements and assets, there are a few factors that encourage innovation execution and can help address the difficulties referenced above, putting forth your school's change attempts more effective.

2.2.3 Instructional Improvement Tech Leadership

The Instructional administration vision in substance advancement is a basic territory that is time and again disregarded since the accessible ICT gadgets are not privately made, the

substance seldom reflects neighborhood challenges in this manner the school authority needs to guarantee there is capacity to create nearby substance to disentangle ICT usage in the nation (Nwana, 2009b). There will be requirement for nearby improvement of proper ICT instructing and learning material for use in the schools. There is need to build up a typical ICT educational plan that can be trailed by the Discetionary schools. The Instructional administration fitness is a critical factor if powerful and effective instructive mediations are probably going to be actualized. Simple learning ICT aptitudes isn't get the job done, yet utilizing ICT to improve the educating and learning is the key for Instruction-innovation usage. Guidance can't exist in disengagement to substance. Indeed, there is a fresh start to like that the two interlaced into what is depicted as Instructional Content Knowledge (ICK), and is a fundamental principle in the current pondering educator schooling.

The term content alludes to unmistakably more than genuine data. It includes all parts of a subject: idea, standards, connections, techniques for request and extraordinary issues. The Instruction segment incorporates activities and procedures of educating, association of homeroom encounters, accommodating different student needs, assessment and usage dependent on student's earlier thoughts, and change of thoughts into reasonable scenes (Payne, 2000).

In any school change exertion, the function of the school overseer through each phase of usage is basic. The mentalities and activities of school pioneers encompassing new advances will empower and uphold instructors as they participate in learning openings and

investigate new apparatuses. Through their part as school pioneers, school overseers can help guarantee that the utilization of innovation is organized, and that instructors feel great difficult new things (Billig et.al, 2005; Staples et al., 2005; Zorfass, 2001). At one school, this was accomplished by necessitating that all school staff, from the school secretary to the head, create individual expert advancement objectives (Abbott, Greenwood, Buzhardt, and Tapia, 2006).

Solid authority in an instructive setting implies that school administrators and other school pioneers must assume different functions in the change cycle, including good example, pioneer, helper, asset supplier, and facilitator (Payne, 2000; Wallace et. al., 2007). The table underneath is incorporated from the writing on the jobs and obligations of heads of innovation activities. Educators are the scaffold between the educational plan and the understudies on one hand, and the supervisor of the study hall during the homeroom association action on the other (Amoo 2003a). In schooling, a definitive objective of any instructional movement is to encourage powerful educating and significant learning. Olomofe (2000) saw that the idea of educating is not, at this point confined to the educator as the main wellspring of information, however the instructor assumes a significant function in any educational plan plans and instructional use.

Usage of ICTs into instructing and learning in Discetionary schooling could change learning and showing perspectives of students and instructors and help to set them up for future difficulties. In any case, the accomplishment of this Implementation will rely upon how the students and educators adjust to the progressions and whether they can make ICT

advances part of their every day life. For what it's worth, there is practically no data accessible with respect to the degree of current ICT use in these Discetionary schools (Price, Cates, and Bodzin, 2002). There is accordingly a need to quantify the use and Implementation in learning and educating in Discetionary schools. Deciding the degree of use of ICT in instructing and learning will thusly include a requirements evaluation of the students and educators to inspect the abberations in ICT utilization.

2.2.4 Change Agility Leadership

Change deftness is the deliberate and arranged planning of the learning organizations to upgrade the probability that its methodologies acknowledged through portfolio, program and undertaking the executives, including the change the board parts to deliver the proposed key advantages. It surveys measure, evaluates and prompts upgraded schools spryness and operational capacity to react viably to circumstances or difficulties.It means that when it comes to ICT changes for effective curriculum use in schools, this capability is fundamental to make technological resources current and up to date. This sort of authority comprises of capabilities, for example, setting deftness, which implies how pioneers select and outline significant activities; partner dexterity, how completely pioneers comprehend the viewpoints held by contrasting partners and how completely they make more noteworthy arrangement with them; imaginative readiness, which is expected to explain unpredictable, novel issues; and self-initiative nimbleness, how proactive pioneers are in gaining from their experience. Additionally, they should show capacity to apply these four sorts of dexterity in three key activity fields: driving institutional change, driving groups, and participating in significant discussions. Likewise the limit with regards to authority

readiness advances through five plainly recognizable levels that compare to settled phases of self-awareness: Expert, Achiever, Catalyst, Co-Creator, and Synergist.

The significance of more profound establishment wide change preparation comes into much more noteworthy concentration with the pervasiveness of progress in the present instruction climate. Today, learning organizations incorporating instructing approaches work in a universe of uncommon change. And keeping in mind that change has consistently been a steady in many ventures, the movement of progress is drastically not the same as it was five or ten years back. It implies that learning institutions that cannot recognize that some technological developments are obsolete, may be faced with wastage of financial resources in acquiring redundant and obsolete ICT resources. It is not clear whether this is could explain the reasons why most learning institutions are adequately equipped with ICT resources yet they are yet to graduate students with high level literacy of ICT application across all subjects.

The requirement for institutional change nimbleness initiative couldn't be more clear. Most foundations use change the board as a way to manage the requirements of a particular change. In any case, in the event that they can use components of progress readiness and give initiative as a feature of a general institutional methodology, and nicely plan to decrease obstructions and upgrade supporting society, schooling frameworks and structures, the change the board endeavors of some random undertaking or program will be not so much grave but rather more liable to succeed. It implies that arranged change dexterity authority prepares for effective technique usage.

Exclusively, people look for soundness, and exploration has indicated that in any event, when they acknowledge and disguise the estimation of progress, yet they much of the time neglect to change. Kegan and Lahey (2009) recommend that even where there are clear define objectives, regularly there may exist at the same time and unknowingly settled hindrances that sabotage those plans contending responsibilities, suspicions, practices and convictions. This creates a knowledge gap that needs academic solutions.

It means that learning institutions require multiple change agility efforts to provide lastingsolutions to challenges that are hard to address in a solitary change exertion. They are unavoidable school difficulties that request methodologies of their own: techniques to change obstructing social standards and inspirations; procedures to guarantee educated assets are accessible for sending when required; and systems to guarantee supported administration responsibility to the course of the school and its execution.

The ICT change agile leaders are fundamental in creating an environment that enhance changing mindsets and attitudes; reformed teaching and learning culture; underestimation of complexity; minimize shortage of resources; motivate high level of commitment; improve change agile know-how and motivation of involved academic and not academic staff. Successful change-agile leaders react to changes in the institutional climate by taking advantage of lucky breaks, including tossing out old models and growing better approaches for getting things done. They attempt to make change thinking infectious, inserting it into all that they do from the most principal every day connections to the most mind boggling technique.

These pioneers must exhibit incorporated practices that, together, make an upper hand for the instructive framework in their foundations. Such pioneers share a convincing, clear reason, look forward and see opportunity, search out what's not working, advance determined danger taking and experimentation and search for limit traversing organizations. They need the capacities to utilize these practices working together with one another, make culture moves that expansion change deftness. They are shifts that should be made at all degrees of authority. But studies have shown that hardly any individual has been able to demonstrate such capabilities. This may explain the reasons why most schools lack abilities to take effective action in complex, rapidly changing conditions.

Similarly, schools need initiative to recognize empowering agents to detect the climate, institutional structure, reception of ICT, institutional learning, human asset procedures, administration, preparation to change and cooperation with the partners were the eight components distinguished. As indicated by Menon and Suresh (2020) the underlying model uncovered authority as the most significant empowering agent followed by human asset methodologies and hierarchical structure. This may help in reconfiguring or replacing your information ICT systems when new marketplace realities change the way you have to do business.

2.3 Research Knowledge Gap

The literature recognises many factors affecting integration of ICT in education system. The literature reviewed reveal that ICT has different meanings in different contexts and educators see its place in the curriculum from differing perspectives. The literature has also

identified that ICT usefulness is not universally automatic, what works in another country may not be useful to another. In finding out about, and with ICT, understudies may take an interest in a wide scope of exercises from video-production, to paper creation, creating abilities and aptitude in these advancements prior to utilizing them in inventive manners to tackle issues. ICT aptitudes are cross-curricular and they can be coordinated into all basic learning regions (Staples, Pugach, and Himes, 2005). It is likewise apparent that the advantages joined by ICT use on students, educators and schools contrast regarding key impact zone and exploration techniques utilized, by and large, most confirmations concern the impact of ICT on instructors, trailed by students and in conclusion on schools. Proof from the examinations evaluated on the effect of ICT on schools is scattered and sketchy. There is not really any proof in regions, for example, interior or outside school cooperation, or the interdisciplinary and creative utilization of ICT inside tasks.

This writing survey planned to uncover the fundamental proof of ICT handiness for the three regions of students, educators and schools. It is a huge assemblage of proof as it unites unexpectedly proof. Notwithstanding, an expression of alert is required. Empirical reviews in this thesis revealed biasness in the focus of studies specific to programs, policy goals and traditional education systems (Garet et. al., 2001). A few writings were dispatched concentrates by different bodies bringing about conceivable one-sided results. This additionally implies that other, positive or negative, parts of ICT use and effect zones are not contemplated and henceforth not spoke to in this survey. Accessible free examination proves likewise have been done in inconsistent zones and restricted nations. It is likewise proof that reviews have recognized conditions that favor fruitful ICT usage.

These incorporate disappointment with business as usual, presence of information and abilities, accessibility of assets, accessibility of time, presence of remuneration or motivating forces, interest, duty and administration. However, lack of or inadequate studies on the possible leadership capabilities that can organize these conditions towards single focus, purpose and to achieve specific goals. These conditions may not work individually but need an individual with varied skills, knowledge and attitude to create an environment exposing their accessibility, use in both teaching and learning.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

Chapter three was concerned with the methodologies used in initiating this study. It involved the research design, the geographical study area, the target population, sample sizew and sampling procedures data collection instruments and procedures, data analysis and interpretation and validity and reliability and ethical consideration. These are as shown in the sections that follow:

3.2 Geographical Description of the Study Area

The study lwas carried out in Elgeyo Marakwet County focusing mainly on the secondary schools in the region. These schools lie within the Rift Valley and found in four (4) sub counties including Marakwet East, Marakwet West, Keiyo North, and Keiyo South. The County covers an all out region of 3029.6 km2 which comprises 0.4% of Kenya's complete region. It stretches out from scope 0° 20′ to 1 toward the North and longitude 35° 0′ to 35° 45′ toward the East.

The region is divided into three geographical zones including Highlands, Kerio Valley and Escarpment: all are isolated by the prominent Elgeyo Escarpment. Every one of these zones has pulled in an alternate settlement design. The Highlands, which comprises 49% of the region, is thickly populated because of its blessing with rich soils and dependable precipitation. The Escarpment and the Kerio Valley make up 11% and 40% separately. These regions have low precipitation and are inclined to cataclysmic events, for example,

dry season and avalanches. Because of these unforgiving climatic conditions combined with high instances of uncertainty, these territories have high neediness levels and scanty populace.

It borders West Pokot County toward the North, Baringo County toward the East, Trans Nzoia County toward the Northwest and Uasin Gishu County toward the West. The district has an extended shape and is wedged in the middle of the Uasin Gishu Plateau toward the West and the Kerio River toward the East. The Kerio River has its source in the southern good countries of the region and channels into Lake Turkana.

It outskirts the ensuing Counties: West Pokot toward the North, Baringo toward the East, South East and South, Uasin Gishu toward the South West and West, and Trans Nzoia toward the North West. Its capital and biggest town is Iten. The region is home to two timberland biological systems and water towers in particular Kaptagat and Cherangany and hosts the second biggest woodland cover in Kenya of 37.6%. These environments are a wellspring of numerous waterways that structure the principle water partition running along the Escarpment. East of the water partition is the Kerio catchment zone which channels into Lake Turkana while West of the separation is the Lake Victoria Basin which channels into Lake Victoria. Lake Victoria Basin incorporates the accompanying waterways: Moiben, Chepkaitit and Sabor.

The Kerio catchment territory incorporates River Kerrer and Kerio River. The other significant waterways in the area are Torok, Chesegon, Embobut, Embomon, Arror, Mong

and Kimwarer. The streams taking care of Kerio River have a high potential for supporting water system exercises and for age of Hydro-electric force. Another natural zone is the Kerio Valley. It is restricted, averaging 6.4 km in width and stretches around 61 km a North-South way.

The County has a generally cool atmosphere with fluctuated precipitation levels over the County. This is a direct result of the geomorphology/geography that is described by three unmistakable agro-environmental zones to be specific the good countries toward the west, the ledge and the swamps toward the east. The variety in height from 900 m above ocean level in the Kerio Valley to more than 3000 m above ocean level in the good countries offers ascend to significant contrasts in climatic conditions.

Yearly mean temperatures on the good country range from 18°C – 22°C while down in the valley, it goes from 25°C – 28°C. The normal yearly precipitation in the district goes from 700mm in the semi-dry Kerio valley to 1700 mm on the Keiyo and Marakwet good countries (Cherangany Hills). The County in this manner shows a pattern of diminishing precipitation from west to east. It is the eastern swamps of the area that display lower and less solid precipitation just as being a piece of the district that is at most elevated danger of dry spell and floods. Monetary leisure activity in the province is portrayed by utilizing blended cultivating, which is made extraordinarily out of steers and means cultivating. Different games include private venture, the travel industry and fluorspar mining in Kerio Valley and it transformed into fascinating to dissect ICT educational program usage in resources in such a spot.

3.3 Research Design

A mixed research design comprising of quantitative and qualitative approaches was used. Since most of literature reviewed recognizes that either one of these approaches were used but not both, where the results are conflicting, it is important to integrate them to allow a more complete and synergistic usage of information than to isolate quantitative and subjective information assortment and investigation. This prompted a superior comprehension of the exploration issue researched than both of each alone as at present perceived internationally. This plan prompted increasing in broadness and profundity of comprehension and validation, while counterbalancing the shortcomings inborn to utilizing each approach without anyone else.

It additionally empowered for the utilization of a few methods; techniques and information sources, to look at the authority challenges looked by school chiefs while executing ICT-based educational plan and directions in auxiliary schools. It additionally helped in distinguishing different parts of the examination factors as recognized by the segments of autonomous and measurements of ward factors all the more precisely by moving toward them from various vantage focuses utilizing various strategies and procedures. This assisted with deciding if ICT-based educational program execution has fizzled as the perspective literary works set.

This was appropriate for assessing complex interventions involving ICT- based curriculum implementation and leadership challenges faced by school principals in their respective learning instirtutions. This necessarily enabled formulating a precise problem for

investigation and developing the study objectives and research questions. It also enabled the study to present information regarding the immediate conditions, presentations of crucial issues, study of the unknown fields, theoretical base, and presentation of uncertain problem for study in research. This was crucial since this leadership challenges faced by school principals and the four components in this study have not been thoroughly researched currently. Subsequently this plan permitted the researcher to be familiar with the issue and idea investigated, and empowered the discoveries that encouraged accomplishing of the research questions henceforth accomplishing study goals.

3.4 Population of the Study

Study populace for this study considered the principals of all the 74 secondary schools in Elgeyo Marakwet County. This formed the sampling frame for the study. The records of principals were obtained from the secondary principals' Directory from the offices of Department of Education Elgeyo Marakwet County. An inductive research approach using quantitative and qualitative methods with a descriptive design was used. The target population was 74 principals from all 74 secondary schools in Elgeyo Marakwet County. This gave a total target population of 74 respondents. The units of analysis were 74 secondary schools. Therefore, the study population was 74 Principals.

This was reduced to 63 secondary schools that allowed a reasonable number of schools in a qualitative study (Mugenda & Mugenda, 2003). A sample size of 63 of accessible population was selected. The accessible study population was 63 secondary school Principals. Using the accessible population and with reference to Krejcie and Morgan

(1970, Appendix VI), the following sample size was 63 selected secondary school principals.

3.5 Sample and the Sampling Techniques

Stratified random sampling techniques were appropriate because the schools occur in strata form. It was used in this study to pick out the 63 secondary schools. This guaranteed that thesample selected yielded research discoveries that can be summed up to an enormous populace with edge mistakes that can be resolved factually (Mugenda and Mugenda, 2003).

Therefore, this technique was adopted for the study because it gave every respondent an equal chance of being selected and eliminates biasness. This technique was useful to this research since the researcher sought desired information from these mentioned respondents with the desired characteristics.

3.6 Instruments of Data Collection

The research instrument was self-administered; dependent Likert Scale Questionnaire for school principals with structured and semi structured questions focused on ICT based curriculum implementation problems that are experienced in th eprocess was used.

3.6.1 Likert Scales Questionnaires

Likert Scale survey instrument was utilized to gather information for this investigation. Likert-type scales poll was valuable for this examination since it helped in estimating inert develops of individuals, for example, perspectives, emotions, conclusions, discernments.

Dormant builds are commonly considered as imperceptible individual qualities (implying that there is no solid, target estimation) that are accepted to exist and cause varieties in conduct. The Likert Scale things were expressed with just a single trademark for each thing empowering respondents to have clear and unmistakable character of reaction. Additionally, the Likert-type scales were scored on every thing so the higher the scores the more or some level of level of difficulties of respondents. Additionally, the mean (normal) of the entirety of the things were taken for additional investigations.

Given that ICT based curriculum implementation practices of school principals cannot be measured and understood with one question; a Likert Scale questionnaire instrument was useful. The choices for the respondents ranged from 1= Very Poor; 2= Good, 3= Very Good, 4= Excellent and 0= None Above and 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree. This provided a holistic view of respondents' opinions and their level of agreement. The research instrument also included a mid-point, for the respondents who are neutral (neither positive nor negative) on the subject matter. Scales also assisted in estimating the strength of mentality/feeling as opposed to just "Yes" or "No", "Concur" or "Oppose this idea". It should be recollected anyway that a scale is anything but an exact proportion of a demeanor, simply a method of evaluating relative measures. There are a wide range of scales to browse. This was valuable for the exploration goals since the authority challenges looked by Discetionary school administrators in executing ICT based educational program being referred to was not assigned as expertly having negative or positive drive towards this topic. Therefore, measuring leadership challenges that school principals agree or disagree using various statements about

leadership challenges faced by school principals when implementing ICT-based curriculum and instructions in secondary schools with a rating scale was relevant in collecting appropriate data. These responses were then averaged and combined to establish a more accurate measure of their leadership challenges.

The study employed a self-completion questionnaires; Likert Scale Questionnaire for School Principals (LSQFSPS). According to Borg and Gall (1996) questionnaires are the most efficient way of reaching many respondents or few respondents scattered across a wider geographical area in the shortest time possible. The Likert Scale Questionnaires was ideal for the study since the respondents were more free and confident to express their feelings and opinions about phenomena without the fear of being known since they were required to remain anonymous unless otherwise. The Likert Scale Questionnaires consisted of structured and semi structured questions developed from the study objectives (Mugenda and Mugenda, 2003). In-depth structured Likert Scale questionnaire was suitable and reliable in this study for it generated significant facts and better understanding of leadership difficulties experienced by school administrators while actualizing ICT-based educational plan and guidelines in auxiliary schools in Kenya. The organized shut things were joined by suitable yet restricted alternatives from which the respondents chose the reactions to depict distinctive marvel of the investigation.

The open-finished inquiries likewise permitted the respondent to give subtleties unreservedly with no inciting. The survey was chosen dependent on its nature of guaranteeing secrecy and thus the respondent's readiness to openly give reactions. These

polls were partitioned into two sections: the initial segment was worried about the overall data of the respondents while the subsequent part contained things intended to inspire data on authority challenges looked by school chiefs while executing ICT-based educational plan and guidelines in auxiliary schools. Surveys were gathered around the same time of organization and with the outstanding situations where respondents couldn't get plentiful time, they were mentioned to fill them on later date. By and large, these respondents were given under about fourteen days to fill in the survey. This examination instrument was valuable for this investigation in estimating the usage of ICT based educational plan in Kenya auxiliary schools this cycle has never been widely accomplished leaving most Discetionary school leavers ICT uneducated. This lack of education denies them capacities to contend with their worldwide partners with regards to ICT advancement and inventiveness.

3.6.2.1 Likert Scale Questionnaire for School Principals (LSQFSPs)

The study used LSQFSPs to collect information from 63 principals (Appendix V). LSQFSPs consisted of structured and semi-structured questions. LSQFSPs had two sections, the first section, which represented section A; collected demographic information of the principals; it had 4 questions about demographic information of the sampled principals useful to the objectives of the study.

Next there were sections B, C, D, E and F; that sought information on the independent variables and its four components and also the information about dependent variable. These LSQFSPs were dispensed to the samped participants and given adequate chance to fill. In

area B, there were nine items of statements measuring different areas of ICT execution with 10 items estimating the degree of ICT usage in the auxiliary schools. Area C comprised of inquiries concerning Educational Technology Leadership challenges with two inquiries and 7-things estimating the level of such authority challenges. Area D comprised of inquiries concerning Transformational authority challenges with eleven-objects estimating the level of such initiative difficulties in the schools. Segment E covered instructional administration challenges inquiries with 6-tems estimating the level of such difficulties in schools. The last area, F, included ICT change spryness authority challenges inquiries with 7-things estimating the level of such difficulties in the schools.

3.6.2 Pilot Study

This was done in 44 secondary schools from Baringo County, which neighbours Elgeyo Marakwet County. A both quantitative and qualitative study design and stratified sampling were used. A sample size of 44 secondary schools equivalent to 60% of secondary schools in Elgeyo Marakwet was sampled to participate in this study and they were randomly selected aimed to investigate whether crucial components of a this study such as leadership challenges (educational technology leadership, transformational leadership, instructional leadership and ICT change agility leadership) and the ICT based curriculum implementation were feasible (Thabane, Chu et al. 2010, Cocks & Torgerson, 2013 and Lancaster, Dodd & Williamson 2004).

The researcher was satisfied that the results obtained adequately indicated that the components of this study were feasible. It meant that a full scale of study was feasible using

the components of the topic of study and no components were subjected to alteration. This practicality was found on territories, for example, enrollment rate; maintenance levels and qualification models; time and assets required when leading the real examination and the issues with information the executives and with the group engaged with the investigation.

It was likewise discovered from the consequences of pilot study that the primary examination was possible when degree of consistency of the pilot study surpassed 60%. Along these lines the pilot study populace, from which the example was shaped, should have been equivalent to the fundamental examination. Nonetheless, the members in the pilot study didn't shape the example size of the genuine investigation. This was to evade members changing their conduct later in the genuine investigation. It was in this manner reasoned that the primary examination was attainable, with changes and close observing.

3.6.2.1 Validity of the Instruments

Deciding legitimacy of the instrument was one irreplaceable qualities of estimation that must be considered in setting up the suitability and value of instruments of estimations. It tried the level of precision of the techniques for measures. As shown in the dependability beneath, this meant that there was significant level of legitimacy, which implies it created results that related to genuine properties, attributes, and varieties in the real exploration. The legitimacy in this investigation was assessed by contrasting the outcomes with other pertinent information or hypothesis from inspected writing. This included existing hypothesis and information, proportion of how estimation covers all parts of the idea being estimated nd how the aftereffect of the measures utilized in this investigation related to other legitimate proportions of a similar idea.

3.6.2.2 Reliability Analysis

A reliability of quality of research instrument tends to whether or not the aftereffects of the estimating measures are predictable on events when they should be reliable (Trochim, 2006). This reliability was determined based on its consistency to the measures used in this study across time, across raters or observers and the consistencies of these measurements themselves. Therefore, the literature review was planned to capture components of leadership challenges in implementation of ICT based curriculum, the methodology was also planned and included the chosen sample set and size, sample preparation, external conditions and measuring techniques. Moreover, the discussions of the findings were also reliable and valid as they were consisted and reflect true values of the study findings. Finally, the reliability also was determined on the conclusions for recommendations of the study findings, which allowed for providing for consistent and reliable recommendations.

The examination kept an eye on the consistency of results across time, across various onlookers, and across parts of the test itself. This consistency was resolved dependent on the capacities of examination strategies utilized in this investigation were comprised in estimating property and conduct in understanding administration challenges influencing the execution of ICT based educational plan in auxiliary schools in Elgeyo Marakwet County. This was urgent in deciding the degree to which estimations utilized in this examination were repeatable when various people play out the estimations, on various events, under various conditions, with apparently elective instruments which measure something very similar (Thabane et al. 2010) or strength of estimation over an assortment of conditions in which essentially similar outcomes should be gotten.

It was therefore concluded that the techniques used to collect data was able to produce results that were precise, stable and reproducible. This reliability was therefore considered throughout the data collection process.

The items were estimated by a 5-point Likert-scale, which goes from emphatically deviate (1) to unequivocally concur (5). Unwavering quality examination was hence done utilizing Cronbach's Alpha which quantifies the inside consistency to set up if certain things inside a scale measure a similar build. Cronbach Alpha was set up for each factor. The discoveries were as appeared in Table 3.1 show. It showed that instructional administration had the most elevated unwavering quality (α= 0.8561), trailed by ICT based educational program usage (α=0.8139), instructive innovation authority (α=0.7932) and ICT change deftness initiative (α= 0.7011). This is an outline that all the four factors were dependable as their unwavering quality qualities surpassed the recommended edge of 0.7. This agrees with Gliem and Gliem (2003) who set up the Alpha worth limit at 0.7.

Table 3.1: Distribution of Reliability Analysis

Scale	Cronbach's Alpha	Number of Items
ICT Implementation	0.8139	10
Educational Technology Leadership (ETL)	0.7932	07
Transformational Leadership (TL)	0.7341	11
Instructional Leadership (IL)	0.8561	06
ICT Change Agility Leadership (CAL)	0.7011	07

3.7 Data Collection Procedures

To quantify the administration challenges looked by school school principals while actualizing ICT-based educational plan and guidelines in auxiliary schools, the examination led an enlightening exploratory investigation. Polls were planned and appropriated to the respondents and given time period enough to gather back finished surveys. Prior to the organization of surveys, a letter mentioning authorization to direct the examination was mentioned from the National Commission for Science, Technology and Innovation (NACOSTI), Kisii University and the Elgeyo Marakwet County. From that point, the analyst joined a covering letter to the survey and mentioned the respondents to partake in this examination. The letters for investment from respondents were needed by the scientist before appropriation of polls.

When utilizing the individual technique, a survey is given to the respondent who finishes it voluntarily, however the specialist is accessible on the off chance that issues are experienced. The analyst likewise conveyed the surveys by hand, with the goal that respondents could finish them quickly and gather (De-Vos, et. al. (2007). The specialist at that point requested that all respondents return the finished surveys following seven days. Following fourteen days the scientist by and by gathered the surveys from the members. The finished polls from the objective populace of 63 respondents were gathered utilizing the individual technique for information assortment.

3.8 Methods of Data Analysis

The facts amassed have been coordinated and arranged specifically request as finished polls and deficient surveys; the incomplete polls have been named invalid and were rejected from the assessment. Subsequent to arranging, the measurements transformed into entered n PC the utilization of (SPSS) factual bundle bargain for sociologies for additional investigations. Recurrence conveyance tables, figures and recurrence discoveries had been utilized to introduce the impacts. The quantitative data become broke down utilizing inferential data where propose and boundless commitment had been produced and examined to choose the level of deviation from the primary goal of the examination. Subjective data was investigated the utilization of recurrence tables and possibilities. Different procedures of assessment utilized covered connections to decide any association among free and ward factors in this investigate.

Quantitative information was broke down utilizing spellbinding measurements, for example, implies, recurrence tallies and rates. Subjective information from the meetings was dissected based on topics and sub subjects that rose up out of the examination. Utilizing a five-point scale (1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree and 5-Strongly Agree) from which mean scores were registered, instructors demonstrated their degree of level of discernment on viability of different parts of the ICT based educational program usage and administration challenges.

The quantity of respondents for every decision was duplicated by the score for every decision, and afterward the complete amount of the scores isolated by the all out number of

respondents to get a mean rating. For example if the quantity of respondents for unequivocally concur, concur, unbiased, differ and emphatically differ were 6, 9, 9, 22 and 14 individually, at that point the mean rating was figured as follows; (5×6)+(4×9)+(3×9)+(2×22)+(1×14) to get a complete score of 151 which is then divided by all out number of 61 respondents (151÷61) to acquire a mean rating of 2.4754.

Since the scale went from 1 to 5, accordingly it implies that the mean score of a given assertion is guided by the accompanying that; $1 \leq x \leq 5$. It is a development of the stretches given on a scope of the sort; $1 \leq 1.5 \leq 2.5 \leq 3.5 \leq 4.5 \leq 5$. This implies that $1 \leq 1.4$ emphatically deviate; $1.5 \leq 2.4$ dissent; $2.5 \leq 3.4$ impartial; $3.5 \leq 4.4$ concur and $4.5 \leq 5$ unequivocally concur.

Any score of 3.5 or more was considered as being characteristic of a positive assessment of the respondents. A score beneath 3.5 was taken as being demonstrative of negative feeling or a difference. The reactions were moved into an outline sheet by arranging. They were counted to build up frequencies, which were then changed over into rates of the absolute number of reactions corresponding to the examination destinations.

3.9 Legal and Ethical Considerations of the Study

Prior to information assortment, the scientist disclosed to all members the reason for the examination and looked for their authorization to partake in the investigation by composing an early on letter clarifying subtleties of the point and the technique for the exploration. Every respondent was needed to sign an assent structure (Appendix XI) as recommended in

Cohen and Manion (1994) for tolerating or not tolerating to partake in the investigation. Members were caused mindful that they to reserve the option to pull out from the investigation whenever and that their support was deliberate. The morals of exploration, for example, availability and adequacy, shielding members from damage, obscurity and secrecy, regarding the protection of members were maintained.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Presentation of Data Based on the Objectives of the Study

This section includes the investigation, introduction and translation of the discoveries coming about because of this examination. The investigation and understanding of information is completed in two stages. The initial segment, which depends on the aftereffects of the survey, manages a quantitative investigation of information.

Questionnaires were hand delivered to the participants from the selected banking institutions as was identified in chapter three. Subsequent to marking the assent structure demonstrating their eagerness to take an interest in the investigation, these members finished the polls. The marked assent structure was collapsed and placed into a different box from the secretly finished polls to guarantee obscurity. In this manner no marked assent structure could be connected to a particular finished research.

4.1.1 Response Rate of Respondents

Distinct insights were utilized to sum up quantitative information and connections which are not evident in the crude information. These assisted with interpretting and comprehend the outcomes. As demonstrated in Table 3.1, of the 63 tested respondents reviewed, just 61 effectively finished and restored the polls, bringing about a reaction pace of 61 (96.8%). The rest 2 (3.2%) were either not returned or were mostly filled, and were checked deficient as were disposed of during investigation. As indicated by Mugenda (2003) a

reaction pace of half or more is worthy. Subsequently an arrival of 96.8% of the polls was viewed as a triumph and satisfactory for this exploration.

4.1.2 Demographic of Respondents

It was critical for this study to understand the demographic profile of respondents. This was necessary to enable this study to provide further analysis and interpretation of the results as shaped by their demographic profile. The background data from the school principals included their gender, age bracket, education level and the duration in the current post held. The information gave significant data on the type of the multitude of respondents associated with the examination. Despite the fact that not integral to the examination, the individual information helped contextualize the discoveries and the plan of fitting proposals to empower further speculation of value of the discoveries on the administration challenges looked by school administrators while actualizing ICT-based educational program and guidelines in auxiliary schools in Elgeyo Marakwet County.

4.1.2.1 Gender of the Respondents

This part of the survey covered the respondents' sexual orientation. The members were approached to demonstrate their sexual orientation. Sex was significant since it would decide the level of in giving answers for the usage of ICT based educational plan in auxiliary schools. The outcomes are as appeared in Table 4.1.

Table 4.1: Frequency Distribution of Gender of the Respondents (Principals)

Valid	Frequency	Percent	Valid Percent
Male	47	77.05	77.05
Female	14	22.95	22.95
Total	**61**	**100**	**100**

Results in Table 4.1 show that male represented 47 (77.05%) and female 14 (22.95%). This suggests that lion's share of members are male representing over 70% of the all out members of this examination. The sexual orientation results show the slanted portrayal of authority in tested auxiliary schools. This means that male dominates the position of secondary school leadership in Elgeyo Marakwet County. It implies that male principals dominate leadership roles in implementing ICT based curriculum in secondary schools. The researcher is curious on whether being a male secondary school principal influences the gender of the teachers who are posted to the various secondary schools, although this was outside the objectives of this study.

This is in agreement with the findings of Njeru (2018) and Wanzala, (2018) that female enrolment in science subjects, which include ICT has been diminishing and also their performance in KCSE mathematics and other science subjects has been below their male counterparts, whom are also not performing well. Thus there are more male principals in secondary schools than female principals, an indication of existence of gender disparity in the leadership role dominancy.

4.1.2.2 Age of Respondents

The respondents were asked how old they were at their past birthday celebrations. Since ICT execution in auxiliary schools in Kenya is as yet a moderately new wonder; period of respondents is of revenue in understanding the difficulties confronting school administrators in the ICT usage drive. The outcomes are as appeared in Table 4.2.

Table 4.2: Distribution of Age Bracket of Respondents (Principals)

Valid	Frequency	Percent	Valid Percent
18-24	0	0	0
25-34	1	1	1
35-44	9	14	14
45-54	34	56	56
55–Above	18	29	29
Total	**61**	**100**	**100**

The results in Table 4.2 show that the age section of members went from 25-54 for the most part. The age section of 45-54 represented 34 (56.0%); 55-over 18 (29.0%) and 35-44 9 (14.0%). This means that lion's share of respondents was inside the age section of 45-54. This infers that the modular age section was 45-54. It should be borne as a top priority that Discetionary school chief age section decides professional training and prone to decide their basic pretended in ICT based educational plan execution in their schools.

The results shows that the school principals who might have had comprehension of ICT and ICT based educational program execution approaches were developed instructors that implies the usage of ICT-based educational program and guidelines in Discetionary schools in Elgeyo Marakwet County is an old fashioned practice and must be in its serious degree now. This serious age section might be credited to the way that school chiefs are frequently delegated from the serving educators who have been serving in different positions, exercises and have demonstrated suitable administration qualities and had served for throughout quite a while. This surmises that a considerable lot of those individuals had progressed conventional initiative practices, however without sizable information, abilities and mentality on ICT skills then they may not contribute essentially to the usage drive of ICT based educational plan. These discoveries are practically identical with the discoveries of Laaria, (2013). In her discoveries, it was demonstrated that the impacts affirmed that school chiefs and B.O.G executives had been essentially more than 50 years vintage since limit of B.O.G administrators had been resigned government workers designated to control the schools.

This infers that the sampled secondary school principals are in the level of mature age that should be accompanied with experience that could be useful in providing leadership critical in enhancing environment for implementation of ICT based curriculum. It infers that majority of the sampled principals a very long time and capable to select and apply reliable leadership behavioural qualities important in implementing ICT based curriculum in instructional activities. This does not concur with the findings of Roseman (2018); Sergei et. al. (2019); Belbase (2016) and Panthi and Belbase (2017) whose findings indicated that

ICT integration in education system experience high degree of a rejection attitude from school principals towards pedagogies and any other reform policies introduced to them in their late age brackets.

Also, it means that the sampled respondents were approaching retirement, which is officially pegged at 60 years. This age bracket may have enabled the individual principal to have acquired teaching and learning experience at different teaching and learning environments. This was an experience suitable for helping ICT based curriculum implementation. However, Seobi and Wood (2016); Ibrahim et. al. (2017); Shuaibu (2016) and Warner (2015), found out that school heads who are approaching their official retirement age showed little concern to the implementation of reforms intended to improve teaching and learning environment in their respective schools. According Ndirangu et. al. (2017) study findings, most of the science teachers have been in the practice for many years, a conditition that could influence learning of science subjects.

4.1.2.3 Respondents Highest Level of Education

The participants were approached to provid their degree of instruction during the time they were finishing the survey. The outcomes are as appeared in Table 4.3.

Table 4.3: Distribution of Respondents' (Principals') Highest Level of Education

Valid	Frequency	Percent	Valid Percent
Primary /Secondary	0	0	0
Certificate	2	03	03
Diploma	2	03	03
Bachelor's Degree	38	62	62
Master's Degree	12	20	20
PhD	7	12	12
Total	**61**	**100**	**100**

The results in Table 4.3 prove that primary/secondary school level was represented by 0(0.0%), certificate and diploma levels both scored 2 (3.0%), Bachelor's Degree 38 (62.0%), Master's Degree accounted for 12 (20.0%) and thoe with PhD level of education accounted for 7 (12.0%). This implies that that majority of the school principals 38 (62.0%) hold bachelor's followed by master's degree. This means that that the secondary school principals are sufficiently qualified in their respective roles. It infers that secondary school principals have adequate education that may enable them to be well versed with principal leadership roles in implementing ICT based curriculum in secondary school for instructional purposes. It is an indication that they have undergone required professional teacher training course that may include the use of ICT in teaching any subject. These trained teachers may find it easy to carry out more ICT application practices in teaching and learning in secondary schools. However, Okono (2015) asserts that master's degree does not add more value as to encourage teachers to enhance the use of ICT based curriculum application. It is important for the schools to employ professionally qualified

teachers who understand and appreciate the role of ICT wide application in instructional practices in secondary schools.

The results indicate that that the sampled respondents have instructional talents and knowledge essential to aid implementation of ICT-based curriculum and commands of their respective schoools (Banju, 2014). This inferred that school principal leadership had attained university schooling and had gone through a few fundamental teaching skills and information that had been vital for management control of colleges and in extension implementation of ICT in education.

The results further reveal that majority of school principals sampled were highly qualified for teaching and heading secondary school level. It means therefore that these teachers were able to utilize teaching opportunities available for their continuous professional development. Moreover, Bunyi, Magoma, Wangia et. al. (2013) asserts that qualified teachers easily overcome teaching methodology challenges, which can predict performance. This is because higher education not only enriches one's knowledge but also reinforces a teacher's confidence, exposing him/her to various teaching pedagogies and/or strategies.

4.1.2.4 Leng of Stay in Current Position

This examination additionally looked to build up the time span members have taken in their present assignments; the outcomes were as shown in Table 4.4.

Table 4.4: Distribution of Leng of Stay in Current Position

Experience Level	Frequency	Percentage
Between 0-2	4	6.2
Between 2-4	10	16.8
Between 4-6	17	27.3
Over 6 years	49	49.7
Total	**61**	**100.0%**

The results in Table 4.4 show that larger part 49 (49.7%) of the respondents have been in their present situation for over six years. This suggests that majority of respondents in this investigation are profoundly knowledgeable about their zones of specialization and larger part have gotten an opportunity to communicate with a changed aptitudes and information obtained from various training discussions for over 6 years. In the current investigation, an important who has held a situation for over two years is considered as experienced while the person who has held a situation for under two years is considered as unpracticed. This is as per area six of the Teachers' Service Commission (T.S.C) Regulations (Act 1966, No.2 of 1967) which expresses that an educator is utilized and just affirmed on perpetual and pensionable terms in the wake of finishing the required two years' probation. A sum of 93.8% of the instructors has a showing experience of over two years. The utilization of ICT in educating and learning may accordingly be essentially impacted by the length a chief has taken in the current position held. Furthermore, a respondent who had held a position for an extensive stretch has a superior possibility of ad libbing hands on exercises during the way toward instructing and learning (Panthi and Belbase, 2017). Warner (2015) contends that

going to individual experience or to that of others is a valuable technique for getting information, yet uncritical utilization of the equivalent may prompt off base ends. He likewise expresses that one of the most productive causes of issues for the starting instructor is his own in-experience as an expert teacher.

Training experience is recognized as one of the principle factors influencing quality ICT application in educating and learning. Experienced educators realize that effective ICT execution in instructing and learning relies upon the utilization of thorough standards and abilities to the errand of planning and introduction of instructing materials that are required for completing usage of ICT based educational program. Kiige (2019) in an investigation on Challenges Facing the Implementation of ICT in instruction framework in Discetionary schools inferred that chief experience is a basic variable. In detailing better educating and learning strategies to apply at some random circumstance and better methods of carrying the topic to understudies experience matters. George et. al. (2014) and Benedict (2013) also support the argument that highly experienced principals perform better in understanding the kin d of technology needed in their schools han inexperienced teachers.

Moreover, Panthi and Belbase (2017) indicates that all together ground proficient improvement in homerooms, task of experienced and rehearsing chiefs guarantees knowledge of focused instructive settings and expert development through friend coaching, dissimilar to if the projects were encouraged by college staff. This infers that researchers are concerned of the level of experience that school principals possess when they are being

assigned duties of implementing ICT based curriculum in the classrooms for classroom instructional activities.

4.2 ICT Based Curriculum Implementation

ICT utilization in educational program and direction turned into a stage forward in its execution strategy. So the ability of this drive transformed into imperative to choose whether the resources are as of now the utilization of ICT in instructing and examining method. It zeroed in on regions including ICT Curriculum Application, ICT Implementation Stages, ICT Implementation Level, and ICT Enabling Environment in Secondary Schools, ICT Skills and Knowledge Taught in School, ICT Implementation Policy Plan and The Level of ICT Implementation at the Sampled Schools. This looked to analyze the different parts of ICT based educational program usage. The outcomes are as appeared in Table 4.5.

Table 4.5: Degree of Using ICT in School in Teaching All Subjects

Participants Opinion		Frequency	Percent
Valid	Yes	12	20.00
	No	49	80.00
	Total	**61**	**100.0**

The results in Table 4.5 show that respondents who expressed Yes, represented 12 (20.0%) and No represented 49 (80.0%). This implies that lion's share of respondents were of the feeling that ICT educational program isn't continually being applied in instructing and learning in their Discetionary schools. This derives that these schools actually pick

conventional instructive methodologies in educating and dominating so is the motivation behind why ICT-based educational plan and training isn't constantly applied all through all the trouble areas in their individual resources.

It additionally suggested that school directors have not provided vital administration that could affect the auxiliary schools to apply ICT in the dominating cycle. Thus there is absence of responsibility of the school initiative to give an authority that drive the use of ICT in educating and learning over all the subjects being instructed in Discetionary schools separated from other none scholarly exercises application too. These discoveries are a lot of like those of Panthi and Belbase (2017) who decided out that an initiative is basic to ICT application in schools, notwithstanding while compelling administration is deficient with regards to then effective execution will not, at this point be reachable.

The findings showed that the sampled respondents were of the opinion that their schools were not using ICT or any technologies in teaching other subjects other than computer studies, which is often Discetionary and not offered in every school. This implies that ICT usage isn't taken a priority in improving instructional practices in the schools under study.

Apart from that, respondents were also asked to indicate whether they actualize ICT based educational plan. The outcomes are as appeared in Table 4.6.

Table 4.6: Implementation of ICT Based Curriculum

ICT Curriculum Opinion		Frequency	Percentage
Valid	Discetionary	42	69.3
	Mandatory	19	30.7
	Total	**61**	**100.0**

The outcomes in Table 4.6 demonstrate that ICT based educational program execution is discetionary and not mandatory as lion's share 42 (69.3%) endorsed and just 19 (30.7%) showed that ICT based educational program usage is necessary in their schools. This infers that lion's share of the members were of the feeling that their schools have no any necessary necessities for ICT based educational plan execution. It surmises that the inspected school administrators have neglected to give required authority towards actualizing ICT based educational plan, which suggested that these schools are not ordered to execute ICT in their instructing and learning. It furthermore suggested that optional school administrators are not giving influential position that can impact ICT usage measure in their auxiliary schools. It additionally construed that ICT based educational plan usage is non-necessary as greater part 69.3% of people showed. This is an unmistakable sign that separated from the generally perceived components influencing ICT execution in schooling frameworks; there are as yet conceivable different reasons given that all around such factors have been distinguished.

To beat the requesting circumstances of ICT usage, the school administrators ought to give the way ahead in making environmental factors that are fundamental for ICT based

educational program execution. Hence the gander at looked to find the ways of life of great climate for execution of ICT. The outcomes were as appeared in Table 4.7.

Table 4.7: ICT Enabling Environment in Secondary Schools

ICT Implementation Challenges	Frequency	Percentage
Accessibility of ICT uphold Labs/homerooms	4	6.0
A dream for ICT improvement and usage over the educational program	3	5.3
An advanced vision inside and past the school	8	13.3
Fitting and Sustained ICT proficient advancement for all degrees of staff	8	13.3
An ICT student Management alongside staff and learners	12	20.0
Staff Desire and Redness for ICT change	10	16.7
Spurred and created staff to accomplish compelling instructing with ICT	6	10.0
Creating and supporting ICT assets	6	10.0
A solid ICT coordinated educational plan substance	3	5.3
Total	**61**	**100.0**

The results in Table 4.7 show that Accessibility of ICT uphold Labs/learning centers accounted for 4 (6.0%), a desire for ICT improvement and usage over the educational program 3 (5.3%) an advanced vision inside and past the school and appropriate fitting and sustained ICT proficient advancement for all degrees of staff both accounted for 8 (13.3%), Three% (20), an ICT student management alongside staff and students accounted for 12 (20.0%), team of workers choice and redness for ICT exchange 10 (16.7%), spurred and created staff to accomplish compelling instructing with ICT and Creating and supporting ICT assets both accounted for 6 (10.0%) and a a solid ICT coordinated educational plan substance scored 3 (5.3%). An ICT learner management along with team of workers and secondary school students scored the highest frequency even as a sturdy ICT included curriculum contents was the bottom reported. The findings imply that there are insignificant

ICT based curriculum implementation environment at the sampled secondary schools. It is an indication that the ICT surroundings reputation is a ways from being equipped for implementation method. The other finding shows that there is poor ICT Enabling Environment in Secondary Schools hence the difficulty in its implementation, which is in agreement with the findings of Hughes, & Zachariah, (2001).

This section sought to establish the provision of ICT policy framework that is used within the Implementation of ICT program and curriculum in secondary faculties. The main is entitled to make sure that there may be ICT policy that guides the schools on what to be done in which, how, why, and whilst and via who. The results are as shown in Table 4.8.

Table 4.8: Policy on ICT Based Curriculum Implementation

	Details	**Freq**	**Percentage**
Valid	There is a clear vision and mission to Implement ICT	13	21.1
	There are clear and achievable ICT Implementation goals	14	22.7
	Not Sure	34	56.0
	Total	**61**	**100.0**

The results in Table 4.8 show that 13 (21.1%) expressed that there is a reasonable vision and mission to execute ICT, 14 (22.7%) and that there is an unmistakable and reachable ICT usage objectives while 34 (56.0%) expressed not certain. This infers that lion's share, 34 (56.0%) of the members were of the sentiment that they don't know of the accessibility of ICT based educational program usage strategy plan. This lack of ICT based curriculum

implementation policy plan may make it difficult to provide effective leadership that drive forward ICT implementation process in secondary schools. It could be the motivation behind why the cycle of ICT educational plan usage is still at its extremely essential degrees of reception as announced by the respondents.

The examination additionally tried to decide the degree of ICT based educational plan execution in the inspected optional schools. This was useful for this study to actualize the background information that usage of tecvhnologies in most learning institutions in Kenya and in particular, Elgeyo Marakwet County, are lagging behind others in technology use in instructional activities especially in teaching across all the subject areas of secondary curriculum of education. The outcomes are as appeared in Table 4.9.

Results in Table 4.9 show that respondents were neutral that ICT based curriculum indicators were being implemented (average mean score **2.77**). The best area performed with the highest mean score of 3.12 was encouraging instructional leadership adding best practices but also indicative of neutral opinion of respondents. This is an indication that ICT based curriculum is hardly being implemented in the sampled secondary schools. The findings indicate that out of the 10-items of measure of level of ICT based curriculum indicators implementation, 1-items with a mean score of 2.48 was a disagreement opinion from respondents; the rest with mean scores of 2.79, 2.94, 2.69, 2.77, 2.79, 2.71, 2.77, 2.66 and 3.12 respectively were neutral opinion on each items of measure.

Table 4.9: Distribution of Pointers of the Level of ICT Based Curriculum Implementation

Promoting ICT-based Curriculum and Instruction	SA	A	N	D	SD	Mean
1. The School shows Information and ICT Skills Concurrently; Subject Meetings Where Teachers Can Share Knowledge and Experience	6(9.3)	9(15.3)	9(15.3)	22(36.7)	14(23.3)	**2.48**
2. We give subject asset that show how ICT can be incorporated and improve learning	14(22.7)	2(3.3)	13(20.7)	20(32.0)	13(21.3)	**2.79**
3. School Management has created approaches that diagram instructive necessities	11(17.3)	14(22.7)	9(14.7)	13(20.7)	15(24.7)	**2.94**
4. The School Leadership has consistently Assisted Teachers to Follow Agreed upon Policy	8(13.3)	12(19.3)	11(17.3)	12(19.3)	19(30.7)	**2.69**
5. The School Leadership builds up a mutual vision; declaring data administration; fabricate strategy dependent on the vision; create usage plan with detail	12(18.7)	9(15.3)	7(11.3)	19(31.3)	14(23.3)	**2.77**
6. Staff improvement in ICT execution abilities and Instructional Leadership	9(14.7)	11(17.3)	10(16.3)	19(30.7)	13(20.7)	**2.79**
7. The School has a Developed Vision and a Policy on ICT Implementation	12(20.0)	9(15.3)	6(9.3)	17(28.0)	17(27.3)	**2.71**
8. Impart what data initiative is and makes an interpretation of this into strategy and practice	11(18.0)	11(18.0)	7(12.0)	17(28.0)	15(24.0)	**2.77**
9. The administration create Peer instructing model; arrangement energizes proficient turn of events; make spending plan accessible for proficient advancement in ICT	10(16.7)	9(14.7)	10(16.0)	18(30.0)	14(22.7)	**2.66**
10. Energize Instructional Leadership Adding Best Practices	17(27.3)	6(10.0)	13(21.3)	16(25.3)	10(16.0)	**3.12**
Overall Average						**2.77**

This infers that majority of the respondents were neutral, a situation of undecided state, about the level of ICT based curriculum indicators implementation. Without implementing ICT based curriculum indicators, then there is no ICT integrated into teaching and learning. These findings concur with the findings by Neyland (2011) where it was established that the state of ICT integration into education system was diminishing, in particular, teachers were at their own discretion to implement what they consider as technology, and there was

lack of guided process of technology application into teaching and learning in their institutions.

Generally, it was seen out that the ICT execution degree could be truly awful and furthermore at its least degree. Different builds of estimating ICT execution had been inadequately said to have been actualized. The discoveries is of the same opinion with those of Kearney, & and McGarr, (2009) who found out that one of a kind measures of ICT use in teaching and learning are lacking due to inadequate implementation.

4.2 The Study Findings Summary

This study pursued leadership challenges that principals of secondary schools face when implementing ICT based curriculum. This variable had four components including educational technology leadership; transformational leadership; instructional leadership and ICT change agility leadership. These were investigated and generally, the results indicate respondents were of opinion that they actually experience challenges in the four components of leadership when implementing ICT based curriculum in the selected secondary schools. The educational technology leadership and transformational leadership both had mean scores of 1.53 an indication that respondents disagreed with its presence; instructional leadership had an average mean score of 1.94 another area respondent disagree while the ICT change agility leadership registered a mean score of 1.52 also indicating that respondents disagreed that they are leadership that are providing direction for the implementation of ICT based curriculum in the sampled secondary schools.

4.3 Educational Technology Leadership Challenges

This section explored the level of Educational Technology Leadership Challenges experienced when implementing ICT based curriculum at the sampled schools. Educational technology leadership is a vital competence in schools where failure is exceptionally announced. ICT usage can bring its answer into this issue. For instance as opposed to utilizing manual frameworks in keeping and keeping up understudies' records, for example, confirmations, expense installments, scholarly exhibitions and consummation dates, an electronically ICT coordinated framework can upgrade security to such records.

There were five fundamental areas of measure to build up the difficulties confronted while actualizing ICT based educational plan in optional schools. These included: the school chief offers a typical vision with instructors invigorating them to utilize ICT in school, there is a solid school administration that drive an all around composed and planned ICT plans for powerful usage of ICT in school, the chief can attract fitting ICT applications to improve individual and expert viability, the chief access and utilize electronic data and interchanges assets, for example, the web and email, to serve the supervisor, teacher and the student, the school chief supports the advancement of student ICT fitness with regards to instructive utilization of ICT as a device and think about training with ICT in learning, at that point plan and actualize suitable and reasonable change by and by. The reaction types were masterminded with a five Likert-type scale going from emphatically dissent (1) to unequivocally concur (5). It inferred that the scores more like (5) demonstrated more significant level of ICT usage while a score more like (1) mean lower level of ICT execution. Coming up next are the key territories the proposal considered in deciding issues

school administrators face in executing ICT in the zone of Educational innovation authority challenges.

4.3.1 Educational technology Leadership Practiced in School

The aimed at establishing the practice of educational technology leadership in the sampled schools. This was important for further exploring whether there is a strong case for its practice or not. This was also useful in further analysisng the data on the understanding how this practice if strong is influencing the way technologies are used in the instructional activities. The results were shown in Table 4.10.

Table 4.10: Educational technology Leadership Practiced in School

Participants Opinion	Frequency	Percentage
Valid Yes	24	38.5
No	37	61.5
Total	**61**	**100.0**

The results in Table 4.10 show that the respondents who held a yes sentiment represented 24 (38.5%) and a no assessment 37 (61.5%). This suggests that greater part of respondents were of the sentiment that the school doesn't utilize ICT based curriculum for educational purposes. This infers that the principals from the sampled secondary school were not able to provide ICT system application environment, an indication of inadequate or total lack of educational technology leadership in this area.

These results are indicator that the participating secondary schools were not able to identify, make available and encourage usage of ICT systems. These discoveries are in consent to the discoveries of Grono (2010) in whose research study found out that ability of a learning institution to be technology compliant is the use of that technology, which is inadequate in most learning institutions. However, these results reveal more of the findings in that they identified the source of the problem, which is educational technology leadership. This leadership is critical in identifying onylu the technology suitable or useful to the local educational needs and not mere application of any technology as was found out by Grono (2010).

4.3.2 The Degree of Educational Technology Leadership in Secondary Schools

This question sought to establish if the degree of Technological Leadership in secondary schools. The results were as shown in Table 4.11.

Table 4.11: The Degree of Educational Technology Leadership in Secondary Schools

		Frequency	**Percentage**
Valid	Very Poor	13	20.7
	Very Good	9	15.3
	Good	5	7.3
	Excellent	4	6.7
	None Above	31	50.0
	Total	**61**	**100.0**

The result in Table 4.11 shows that very poor accounted for 13 (20.7%), very good 9 (15.3%), good 5 (7.3%), excellent 4 (6.7%), and none above 31 (50.0%). This implies that

majority of respondents were of the opinion that the schools have no educational technology leadership in ICT based curriculum implementation. This means that educational technology leadership is not adequately used or altogether not missing a situation that may not drive the effective implementation of ICT in the teaching and learning process in the sampled secondary schools in Elgeyo Marakwet.

4.3.3 Educational Technology Leadership on ICT Implementation

This section sought to establish the educational technology leadership challenges experienced in implementing ICT based curriculum in teaching and learning in secondary schools in Elgeyo Marakwet. There were 8- items of measure of these educational technology leadership challenges faced when implementing ICT based curriculum. These items were measured on a 5-point Likert scale. The results are as shown in Table 4.12.

The results in table 4.12 show that respondents disagreed that the 8- measures of educational technology leadership were actually enhanced during the implementation of ICT based curriculum in the sampled secondary schools (**average mean score 1.53**). The best area performed with the highest mean score of 2.28 was to provide tools to generate course materials for teachers and learners but also indicative of neutral opinion of respondents. This is an indication that educational technology leadership is experienced challenges in the 8-item areas as indicated in Table 4.12. It means that due to lack of this leadership or inadequacy of this leadership, the implementation of ICT based curriculum is not possible in the sampled secondary schools.

Table 4.12: Measures of Educational Technology Leadership on ICT implementation

In Promoting ICT-based Curriculum and Instruction, Principals' Educational Technology Leadership Measures	SD	D	N	A	SA	Mean
1. Provide Tools to generate course materials for teachers and learners	12(19.0)	33(54.0)	7(11.0)	10(16.0)	0(0.0)	**2.28**
2. Planning and organizational tools for concept mapping and lesson planning	37(61.0)	10(17.0)	0(0.0)	14(22.0)	0(0.0)	**1.85**
3. Electronic research and reference tools to support specific areas	48(78.0)	14(22.0)	0(0.0)	0(0.0)	0(0.0)	**1.25**
4. Tools to record class teaching and learning process and notes	42(69.0)	14(22.0)	0(0.0)	6(9.0)	0(0.0)	**1.54**
5. Tools for delivering content to learners, assessing and creating documents using specific ICT programs	42(68.0)	11(18.0)	9(15.0)	0(0.0)	0(0.0)	**1.49**
6. Application of more advanced ICT uses to create multimedia broadcast online	52(85.0)	9(15.0)	0(0.0)	0(0.0)	0(0.0)	**1.15**
7. Using ICT as a tool or a means to creating the end results and not the focus of the lesson	32(52.0)	25(40.0)	5(8.0)	0(0.0)	0(0.0)	**1.59**
8. Using a graphing calculator in science courses for learners to create graphs such as maths, physics, or chemistry graphs	56(92.0)	5(8.0)	0(0.0)	0(0.0)	0(0.0)	**1.08**
Average Mean						**1.53**

This infers that principals of the sampled secondary schools are unable to nurture the development of teaching and learning environment that is ICT based where teachers and learners are able to apply ICT competence in the context of educational use of ICT as a tool. Also the results indicate respondents strongly disagreed with 4-items with mean scores 1.25, 1.49, 1.15 and 1.08; while the respondents also disagreed with another 4- items with mean scores of 1.85, 1.54, 1.59, and 2.28. This infers that generally, respondents were of the opinion that the sampled secondary schools experience educational technology leadership challenges in these 8- item areas at the time of the data collection.

These findings support the findings of Fomunyam (2019) who found out that the utilisation of ICT at the primary and secondary levels is critical if the current low standard of education in Africa is to be improved to a globally competitive level. Fomunyam (2019) further found out that the potential of ICT have-not been fully utilised due to a variety of reasons. However, these findings do not agree with the findings of Rambousek et. al. (2014) where it was found out that the reliance and inability of teachers to make a change from the traditional method of teaching has made ICT impact slow especially in areas with ICT facilities. This required some leadership direction to help harness the situation.

4.4 Transformational Leadership Challenges

The study sought to determine the degree of transformational leadership in the sampled secondary schools. This was determined by the measuring scale of very poor, very good, good excellent and none above. The results are as shown in Table 4.13.

Table 4.13: Degree of ICT Transformational Leadership in Secondary Schools

	Opinion	Frequency	Percentage
Valid	Very Poor	16	26.0
	Very Good	11	17.3
	Good	13	20.7
	Excellent	9	14.0
	None Above	14	22.0
	Total	**61**	**100.0**

The results in Table 4.13 show that very poor accounted for 16 (26.0%), followed by none above 14 (22.0%), good accounted for 13 (20.7%), very good 11 (17.3%) and excellent 9

(14.0%). This implies that majority of participants indicated transformational leadership is very poor in the sampled secondary schools in Elgeyo Marakwet. It infers that due to poor transformational leadership or lack of it, indicators such as active participation, helping school members of staff and the community at large realise ICT dreams; encouraging dissemination and collaboration with teachers; transform teachers posted in their schools into experts in implementing ICT given the prevailing environment; transform individuals into teams that support working through eventual problem to make them engage and adopt pedagogical changes; production of ICT-based curriculum material resources; learning to design curriculum materials to foster development of TPACK and to make rational decisions when selecting the right technology for their school needs cannot be realised. It infers that there is poor technological leadership which means a drive towards ICT compliant may not be achievable and so the schools may continue to lag behind in the drive to implement ICT-based curriculum and instructions.

The study also sought to establish the state of transformational leadership in ICT implementation at the sampled schools. There were 7- items measured on a 5-point Likert scale. These items included active participation, helping school members of staff and the community at large realise ICT dreams; encouraging dissemination and collaboration with teachers; transform teachers posted in their schools into experts in implementing ICT given the prevailing environment; transform individuals into teams that support working through eventual problem to make them engage and adopt pedagogical changes; production of ICT-based curriculum material resources; learning to design curriculum materials to foster development of TPACK and to make rational decisions when selecting the right technology

for their school needs. School leader's vision sets goals to be attained during implementation of ICT. The results are as shown in Table 4.14.

Table 4.14: Measures of Transformational Leadership Challenges

In Promoting ICT-based Curriculum and Instruction, Principals' Transformational Leadership	SD	D	N	A	SA	Mean
1. Enabling Active participation for all	39(64.0)	15(25.0)	0(0.0)	6(9.0)	1(2.0)	**1.61**
2. Helping school members of staff and the community at large realise ICT dreams	42(69.0)	12(19.0)	7(12.0)	0(0.0)	0(0.0)	**1.43**
3. Encouraging dissemination and collaboration with teachers	59(96.0)	2(4.0)	0(0.0)	0(0.0)	0(0.0)	**1.03**
4. Transform teachers posted in their schools into experts in implementing ICT given the prevailing environment	5285.0)	7(12.0)	0(0.0)	2(3.0)	0(0.0)	**1.21**
5. Transform individuals into teams that support working through eventual problem to make them engage and adopt pedagogical changes	38(62.0)	9(14.0)	7(12.0)	7(12.0)	0(0.0)	**1.72**
6. Production of ICT-based curriculum material resources	13(22.0)	30(49.0)	9(15.0)	6(10.0)	2(4.0)	**2.36**
7. Learning to design curriculum materials to foster development of TPACK and to make rational decisions when selecting the right technology for their school needs	23(38.0)	21(34.0)	0(0.0)	12(19.0)	6(9.0)	**2.35**
Average Mean						**1.53**

The results in table 4.14 show that respondents were on average disagreed with the statement that there is provision of transformational leadership for the implementation of ICT based curriculum. This was indicated by average mean score of 1.53. On the item that the transformational leadership provides active participation for all, the respondents disagreed recording a mean score of 1.61; the respondents strongly disagreed, recording mean score of 1.43, that transformational leadership helps school members and the community at large to realise ICT dreams. The result also show that transformational leadership is unable to encourage dissemination and collaboration with teachers registering

a mean score of 1.03; on the item that the leadership transform teachers posted in their schools into experts in implementing ICT given the prevailing environment, the respondents strongly disagreed accounting for a mean score of 1.21. This is an indication that the sampled school principals are not able to transform the human resources they have into experts reliable in the ICT based curriculum implementation process. This may lead to a challenge in transforming any available resource, including human resource such as teachers into valuable and useful for the implementation of ICT curriculum in the sampled secondary schools. It infers that without transforming these factors into a form for their applicability may be a contributing factor. This is one of the findings of this study. Hence transformational leadership is experiencing the inability to provide direction towards building experts among teachers in implementing ICT in their respective secondary schools. This is against the findings of Ashikuzzaman (2014) who indicated that among the factors affecting realisation of ICT in education system in developing countries are financial, physical resources, human resources.

It is also indicated by the results in Table 4.14 that transformational leadership is not able to transform individuals into teams that support working through eventual problem to make them engage and adopt pedagogical changes. The respondents disagreed with the statement of this item with a mean score of 1.72. These results are in agreement with the findings of Fomunyam (2019) who found out that reliance and inability of teachers to make a change from the traditional method of teaching has made ICT impact slow especially in areas with ICT facilities. At the same time, the findings of Rambousek et al (2014) alluded that there is the need for the development of problem-solving skills in teachers and students in

addition to critical thinking. These can be achieved if teachers and students are shown how to effectively harness the power of information that is available on the internet for academic purposes.

When it comes to the leadership in the production of ICT-based curriculum material resources, the results in Table 4.14 indicate that respondents disagreed with the item having a mean score of 2.36. This infers that the sampled secondary schools experienced the transformational leadership challenge in the design, development and implementation of ICT based curriculum material resources. It was also indicated in the results that the item that the sampled secondary schools had leadership that could design curriculum materials to foster development of TPACK and to make rational decisions when selecting the right technology for their school needs; the respondents disagreed with this statement with a mean score of 2.35. This was an indication that transformational leadership had no knowledge or skills in the designing curriculum materials to foster development of TPACK and to make rational decisions when selecting the right technology for their school needs.

These findings are in support of the study findings by Kisirkoi (2015) and Ibenegbu (2018) who found out that teacher training needs to be able to design and adapt content materials to suit student needs, to search and manage information, and to be aware of the ethics and dangers inherent in the use of ICT technologies and not merely the development of computer literacy skills. They argued that these are some of the ways in which ICTs need to be integrated into continuing teacher professional development and training programs. It means that school leadership must be able to transform the teachers towards developing

their expertise and experience in designing and developing as well as adopting ICT pedagogies such as TPACK to support effective ICT based curriculum implementation.

4.5 Instructional Leadership Challenges

Technological Leadership is a key area in schools where inefficiency is highly reported. ICT implementation can bring its solution into this problem. For example instead of using manual systems in keeping and maintaining students' records such as admissions, fee payments, academic performances and completion dates, an electronically ICT integrated system can enhance security to such records.

The study sought to determine the degree of Instructional leadership in the schools. This was determined by the measuring scale of very poor, very good, good excellent and none above.

Table 4.15: Degree of Instructional Leadership

	Opinion	Frequency	Percentage
Valid	Very Poor	39	26.0
	Very Good	26	17.3
	Good	31	20.7
	Excellent	21	14.0
	None Above	33	22.0
	Total	**61**	**100.0**

The results are as shown in Table 4.15. From the results in Table 4.20 one realizes that very poor accounted for 26.0% (39) out of (150), followed by none above 22.0% (33), good 20.7% (31), very good 17.3% (26) and excellent 14.0% (21). This implies that majority of

participants were not of the opinion that the school leadership shows degree of Instructional leadership.

There were six items used to establish the challenges faced when implementing ICT in the library system, which included: Provision of Relevant devices for all teachers and learners to use to support teaching and learning; Simplify the complex, integrated process, involving school community procedures, ideas, devices and organisation for analysing problems and devising implementation and evaluation and managing solutions to the problems in situations where learning is purposive and controlled; The principal is able to draw appropriate ICT applications to enhance personal and professional effectiveness; Develop school procedures and process for supporting the operation of ICT infrastructure; Making choices and identifying best fit ICT for a particular school culture and setting and Deciding appropriate technology sensitivity to the school population, physical structures and practices. The results are shown in Table 4.16.

The results in table 4.16 show that respondents were on average, disagreed with the statement that there is provision of instructions leadership for the implementation of ICT based curriculum. This was indicated by average mean score of 1.94. On the item that the instructional leadership provides relevant devices for all teachers and learners to use to support teaching and learning, the respondents disagreed recording a mean score of 1.94; the respondents disagreed with the statement that instructional leadership has simplified the complex, integrated process, involving school community procedures, ideas, devices and organisation for analysing problems and devising implementation and evaluation and

managing solutions to the problems in situations where learning is purposive and controlled scoring a mean of 1.75.

Table 4.16: Measures of Instructions Leadership Challenges

In Promoting ICT-based Curriculum and Instruction, Principals' Instructions Leadership Challenges Measures	SD	D	N	A	SA	Mean
1. Provision of Relevant devices for all teachers and learners to use to support teaching and learning	34(56.0)	12(20.0)	0(0.0)	15(24.0)	0(0.0)	**1.94**
2. Simplify the complex, integrated process, involving school community procedures, ideas, devices and organisation for analysing problems and devising implementation and evaluation and managing solutions to the problems in situations where learning is purposive and controlled	29(47.0)	22(36.0)	10(16.0)	1(1.0)	0(0.0)	**1.75**
3. The principal is able to draw appropriate ICT applications to enhance personal and professional effectiveness	31(50.0)	20(33.3)	10(16.7)	0(0.0)	0(0.0)	**1.66**
4. Develop school procedures and process for supporting the operation of ICT infrastructure	51(83.3)	10(16.7)	0(0.0)	0(0.0)	0(0.0)	**1.16**
5. Making choices and identifying best fit ICT for a particular school culture and setting	22(36.5)	13(20.6)	10(16.4)	9(14.3)	8(12.2)	**2.53**
6. Deciding appropriate technology sensitivity to the school population, physical structures and practices	20(33.3)	18(29.6)	14(22.8)	9(14.3)	5(7.9)	**2.61**
Average Mean						**1.94**

The result also show that instructional leadership has failed to draw appropriate ICT applications to enhance personal and professional effectiveness with respondents disagree having a mean score of 1.66; on the item that instructional leadership develop school procedures and process for supporting the operation of ICT infrastructure, respondents strongly disagree with a mean score of 1.16. This is an indication that the sampled school principals are not taking the lead in the instructional guide to their schools, a situation that may leave teachers to either continue with traditional teaching approaches or implement the

kind of technology not relevant to the prevailing school needs. The sampled schools are experiencing instructional leadership challenges and cannot implement ICT based curriculum. Hence instructional leadership is experiencing the inability to provide direction towards building experts among teachers in implementing ICT in their respective secondary schools. This is against the findings of Adomi and Kpangban (2010) who indicated the need for digital learning materials relevant to local curricula is more urgent as ICT becomes integrated into the teaching and learning process across the curriculum. At national levels ministries are identifying institutional responsibilities and are beginning to encourage collaborative efforts on a regional basis.

It is also indicated by the results in Table 4.16 that instructional leadership is not able to make choices and identifying best fit ICT for a particular school culture and setting. The respondents were neutral with a mean score of 2.53. These results are in agreement with the findings of Higgins (2017) and Linways (2017) they found out that in secondary schools, information computer studies (ICS) is taught as a separate subject, aimed at developing several competencies and inability of teachers to make a change from the traditional method of teaching remain a common practice.

When it comes to the leadership in the deciding appropriate technology sensitivity to the school population, physical structures and practices, the results in Table 4.16 indicate that respondents were neutral with a mean score of 2.61. This infers that the sampled secondary schools experienced the instructional leadership challenge in all 4-items of measure while they are not able to form an opinion about 2-items of measure where they were neutral.

However, generally, the respondents generally disagreed with the capability of instructional leadership.

These findings are in support of the study findings by Mavellas, Wellington and Samuel (2016); Prait (2017) and Padayachee (2017) who found out that new digital technology are appropriate for use in the African context in that they have the potential to revolutionise the quality of training when carefully integrated within programs that are pedagogically strong and well supported. They found out that the use of ICT in some of the poorest parts of the world, if well planned and implemented, could have a significant impact on the self-image, confidence and professionalism of teachers. So ICT offers the potential to redefine, even enhance the status of teachers within communities and more broadly across the societies they serve.

4.6 ICT Change Agility Leadership Challenges

This section sought to determine the ICT change agility leadership challenges experienced when implementing ICT based curriculum in sampled secondary schools. There were 6 items measured on a 5-point Likert scale. These items included: Modify curriculum, instruction, and content resources to reflect learning objectives and incorporate ICT as a tool for learning; Align curriculum and assessment to support learning and improve instruction through real-time, technology-enabled assessments; Understanding ICT content and incorporate them in curriculum development; Be able to identify how various components of the curriculum link together; Use curriculum in planning instruction and assessment; Lead teachers to agree on standards, follow the adopted curriculum, use

common pacing charts, and develop shared assessments and Developing team members agree to increase the consistency in their classroom curriculums and administer common assessments. The results are as shown in Table 4.17.

Table 4.17: Measures of ICT Change Agility Leadership Challenges

In Promoting ICT-based Curriculum and Instruction, Principals' ICT Change Agility Leadership Challenges Measures	SD	D	N	A	SA	Mean
1. Reviews process, assesses and leads to enhanced schools agility and operational capability to respond effectively to opportunities or challenges	41(67.0)	14(22.0)	5(8.0)	1(2.0)	1(1.0)	**1.53**
2. Makes technological resources current and up to date	24(40.0)	37(60.0)	0(0.0)	0(0.0)	0(0.0)	**1.61**
3. Provide leadership that selects and frame important initiatives; full understanding the perspectives held by differing stakeholders and how fully they create greater alignment with them; solving complex, novel problems; use of experience in learning	21(35.0)	31(50.0)	3(5.0)	6(10.0)	0(0.0)	**1.90**
4. Leading institutional change, leading teams, and engaging in pivotal conversations	17(28.6)	39(64.3)	0(0.0)	4(7.1)	0(0.0)	**1.16**
5. Possession of and being an expert, achiever, catalyst, co-creator, and synergist	42(69.0)	15(25.0)	1(2.0)	1(1.0)	2(3.0)	**1.46**
6. Creating an environment that enhance changing mindsets and attitudes; reformed teaching and learning culture; underestimation of complexity; minimize shortage of resources; motivate high level of commitment; improve change agile know-how and motivation of involved academic and not academic staff	40(66.0)	15(24.0)	6(10.0)	0(0.0)	0(0.0)	**1.44**
Average Mean						**1.52**

The results in table 4.17 show that respondents were on average, disagreed with the statement that there is provision of ICT change agility leadership for the implementation of ICT based curriculum. This was indicated by average mean score of 1.52. On the item that the ICT change agility leadership Reviews process, assesses and leads to enhanced schools agility and operational capability to respond effectively to opportunities or challenges, the

respondents disagreed recording a mean score of 1.53; the respondents also disagreed with the statement that ICT change agility leadership makes technological resources current and up to date scoring a mean of 1.61. The result also show that ICT change agility leadership has failed to provide environment ready to select and frame important initiatives; full understanding the perspectives held by differing stakeholders and how fully they create greater alignment with them; solving complex, novel problems; use of experience in learning with respondents disagree having a mean score of 1.9; on the item that ICT change agility leadership Leading institutional change, leading teams, and engaging in pivotal conversations, with a mean score of 1.16 that falls between $1 \leq X < 1.5$; an indication that respondents strongly disagree that ICT change agility leadership Leading institutional change, leading teams, and engaging in pivotal conversations is practiced.

This is an indication that the sampled school principals are may not be able to provide leadership that would quickly identify technological trends that may affect their relevancy during implementation. It means that the sampled schools are experiencing ICT change agility leadership challenges and cannot respond to changes in the institutional environment by seizing opportunities, including throwing out old models and developing new ways of doing things.

This may not allow the leadership to make change thinking contagious, embedding it into everything they do from the most fundamental daily interactions to the most complex strategy in the education system. The results are indication that due to the challenges in ICT change agility leadership, there may be lack of ability to demonstrate integrated behaviours

that, together, create a competitive advantage for the educational system in their schools. This may also lead to lack of a shared a compelling, clear purpose, look ahead and see opportunity, seek out what's not working, promote calculated risk-taking and experimentation and look for boundary-spanning partnerships. These findings support the findings of Samarakoon, Christiansen and Munro (2017) who indicated that leaders need the capabilities to use change behaviours in concert with each other, create culture shifts that increase change agility. They are shifts that need to be made at all levels of leadership. But studies have shown that hardly any individual has been able to demonstrate such capabilities. This may explain the reasons why most schools lack abilities to take effective action in complex, rapidly changing conditions.

The respondents also strongly disagreed that ICT change agility leadership possess and being expert, achiever, catalyst, co-creator, and synergist in the implementation of ICT with a mean score of 1.46; they also strongly disagreed that ICT change agility leadership creates an environment that enhance changing mindsets and attitudes; reformed teaching and learning culture; underestimation of complexity; minimize shortage of resources; motivate high level of commitment; improve change agile know-how and motivation of involved academic and not academic staff with a mean score of 1.44.

These findings are in support of the study findings by Menon and Suresh (2020) that the structural model revealed leadership as the most crucial enabler followed by human resource strategies and organizational structure. This may help in reconfiguring or replacing the information ICT systems when new marketplace realities change the way you have to

do business, therefore schools need leadership to identify enablers to sense the environment, institutional structure, adoption of ICT, institutional learning, human resource strategies, leadership, readiness to change and collaboration with the stakeholders were the eight factors identified. But hardly any individual has been able to demonstrate such capabilities. It challenges most secondary schools in the process of implementing ICT based crrriculum into learning of all the curriculum disciplines.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Taken on a face value, the sampled secondary schools faced leadership challenges that may be a barrier to the implementation of ICT based curriculum. The findings indicate that all the four components of leadership; educational technology leadership, transformational leadership, instructional leadership and ICT change agility leadership received mean scores of 1.53, 1.53, 1.94 and 1.52 respectievly. This showed that the respondents either disagreed or were neutral about the effectyive application of these four components for ease of implementation of ICT based curriculum. The study therefore conclude that the sampled schools experienced educational technology leadership, transformationa leadership, instructional leadership and ICT change agility leadwership challenges barring them from implementing ICT based curriculum for use across all subjects of study and any other fundamental life area wher ICT is useful. It means that the sampled secondary schools experienced the leadership challenge in ICT capabilities required in implementing ICT based curriculum.

The demographic finding indicated that male participants were the majority accounting for 47 (70.0%), which means that leadership roles and responsibilities are dominated by male participants who dominated the position of secondary school leadership. It was then concluded that ICT based curriculum implementation in the sampled secondary schools was mainly under the leadership of male principals. It was also found out that the modal age bracket was 45-54 years. It was concluded that this age bracked determines

accumulation of job experience that may likely to determine their critical leadership role played in ICT based curriculum implementation in secondary schools. It was also found out that majority of the school principals 38 (62.0%) hold bachelor's and the conclsion was that the secondary school principals had adequate education and were sufficiently qualified in their respective roles and could enable them to drive the school leadership in implementing ICT based curriculum in secondary school for teaching and learning; moreover, it was found out that majority 49 (49.7%) of the respondents have been in their current position for more than six years and the conclusion was that this length of tenure in current position could make them build high level of experience useful in understanding the ICT needs of rtheir schools.

In terms of ICT based curriculum implementation, it was found out that majority of respondents 49 (80.0%) stated that ICT is not used for teaching and learning across all the subjects, it was therefore concluded that the sampled secondary schools harldy implemented ICT based curriculum for teaching and learning; it was also found out that ICT implementation in the sampled secondary schools was considered Discetionary, this led to a conclusion that the sampled secondary schools lacked leadership that could provide roadmap for the implementation of ICT based curriculum; the result also found out that in terms of ICT infrastructure enabling environment, it was found out that none of the 9-items of measure scored half of the total frequency of respondents, the highest was 12 (20.0%), the conclusion made was that the sampled secondary schools lacked leadership that could develop enhancing environment to prepare ICT based curriculum environment for implementation; it was also found out that those who are not sure of ICT policy plan

accounted for 34 (56.0%) of the respondents, the conclusion was that school leadership that could design and develop roadmap for ICT based curriculum implementation was a challenge; finally, it was found out that the respondents were neutral that ICT based curriculum indicators were being implemented, indicated by average mean score 2.77; it was concluded that sampled secondary school faced challenges in areas such as teaching Information and ICT skills concurrently; subject meetings where teachers can share knowledge and experience; provision of subject resource that show how ICT can be integrated and enhance learning; developing policies that outline educational needs; leadership that assists teachers to follow agreed upon policy; develop shared vision; asserting information leadership; build policy based on the vision; develop implementation plan with detail; staff development in ICT implementation skills and instructional leadership; develop vision and a policy on ICT implementation; communicate what information leadership is and translates this into policy and practice; the leadership develop peer coaching model; policy encourages professional development; make budget available for professional development in ICT and encourage instructional leadership adding best practices.

5.1.1 Objective one was to Establish the Educational Technology Leadership Challenges Experienced when Implementing ICT-Based Curriculum and Instruction in Secondary Schools in Elgeyo Marakwet County

It wa found out that out of the 8- items of measuring educational leadershiop challenges, respondents disagreed that non of them was actually being applied in their secondary schools, accounted by the average mean score of 1.53. Based on the findings, it is

concluded that there is educational technology leadership challenges experienced in areas such as providing tools to generate course materials for teachers and learners; planning and organizational tools for concept mapping and lesson planning; electronic research and reference tools to support specific areas; tools to record class teaching and learning process and notes; tools for delivering content to learners, assessing and creating documents using specific ICT programs; application of more advanced ICT uses to create multimedia broadcast online; using ICT as a tool or a means to creating the end results and not the focus of the lesson and using a graphing calculator in science courses for learners to create graphs such as maths, physics, or chemistry graphs. To to the challenge of educational technology leadership, these secondary schools may not be able to deal with identification and selection of appropriate technologies that are useful to every need of specific secondary school and not forcefully acquiring technologies not suitable for education, and also not relevant to the Kenyan economic needs as well as the specific school community needs teaching and learning needs.

5.1.2 The second objective was to determine the Transformational Leadership challenges faced by principals when implementing ICT based curriculum in Secondary schools in Elgeyo Marakwet County

It was also found out that of the 7 –items of measure of transformational leadership challenges, respondents disagreed that they were being applied in their secondary schools for the implementation of ICT based curriculum with average mean score of 1.53. therefore it was concluded that the sampled secondary schools experienced transformational leadership challenges in areas such that included; enabling active participation for all;

helping school members of staff and the community at large realise ICT dreams; encouraging dissemination and collaboration with teachers; transform teachers posted in their schools into experts in implementing ICT given the prevailing environment; transform individuals into teams that support working through eventual problem to make them engage and adopt pedagogical changes; production of ICT-based curriculum material resources and Learning to design curriculum materials to foster development of TPACK and to make rational decisions when selecting the right technology for their school needs. The sampled school principals could not provide leadership that is effective to development, creation and application of these areas, hence making it difficult for these schools to effectively implement ICT for improved teaching and learning as well as application across the subject areas. This conclusion means that the sampled secondary schools do not have leadership that can transform teachers and any other indiciduals in the schools to experts and teams reliable for implementation of ICT based curriculum.

5.1.3 The third objective was to examine instructional leadership challenges faced by principals when implementing ICT based curriculum in Secondary schools in Elgeyo Marakwet County

This objective sought to establish any instructional leadership challenges faced by principals when implementing ICT based curriculum in Secondary schools in Elgeyo Marakwet County. From the findings, it was found out that the sampled secondary schools experienced instructional leadership challenmges with the respondents disagreed that instructional leadership was being practiced for the implementation of ICT based curriculum, average mean score 1.94. All the 6- items of meaure of instructional leadership were disagreed with and only 2 – items that respondents were netural about. It was

therefore concluded that the sampled secondary schools experienced instructional leadership challenges in areas that included; provision of relevant devices for all teachers and learners to use to support teaching and learning; simplify the complex, integrated process, involving school community procedures, ideas, devices and organisation for analysing problems and devising implementation and evaluation and managing solutions to the problems in situations where learning is purposive and controlled; the principal is able to draw appropriate ICT applications to enhance personal and professional effectiveness; develop school procedures and process for supporting the operation of ICT infrastructure; making choices and identifying best fit ICT for a particular school culture and setting and deciding appropriate technology sensitivity to the school population, physical structures and practices.

5.1.4 The fourth objective was to establish the ICT Change Agility leadership challenges faced by principals when implementing ICT based curriculum in Secondary schools in Elgeyo Marakwet County

The objective four aimed to determine the ICT Change Agility leadership challenghes faced by principals when implementing ICT based curriculum in secondary schools in Elgeyo Marakwet County. It was found out that the sampled secondary schools experienced ICT Change Agility leadership challenghes as the respondents disagreed that ICT Change Agility leadership was being practiced for the implementation of ICT based curriculum, average mean score 1.52. All the 6- items of meaure of ICT Change Agility leadership were disagreed with all the statemsts of the 6-items of measure. It was therefore concluded that the sampled secondary schools experienced ICT Change Agility leadership challenghes in areas that included; reviews process, assesses and leads to enhanced schools agility and

operational capability to respond effectively to opportunities or challenges; makes technological resources current and up to date; provide leadership that selects and frame important initiatives; full understanding the perspectives held by differing stakeholders and how fully they create greater alignment with them; solving complex, novel problems; use of experience in learning; leading institutional change, leading teams, and engaging in pivotal conversations; possession of and being an expert, achiever, catalyst, co-creator, and synergist; creating an environment that enhance changing mindsets and attitudes; reformed teaching and learning culture; underestimation of complexity; minimize shortage of resources; motivate high level of commitment; improve change agile know-how and motivation of involved academic and not academic staff.

5.2 Recommendations

From the conslucions made above, it was recommended as follows:

- There is need to provide educational technology leadership to overcome the mentioned challenges in order to provide tools to generate course materials for teachers and learners; planning and organizational tools for concept mapping and lesson planning; electronic research and reference tools to support specific areas; tools to record class teaching and learning process and notes; tools for delivering content to learners, assessing and creating documents using specific ICT programs; application of more advanced ICT uses to create multimedia broadcast online; using ICT as a tool or a means to creating the end results and not the focus of the lesson and using a graphing calculator in science courses for learners to create graphs such as maths, physics, or chemistry graphs. These may be fundamental to

the identification of the appropriate technology for the culture and structure of educational need of each secondary school. It may help in understanding the complexity and massive integration of systems, processes and applications, which often result in major outages and instability issues. This way, implementation of ICT based curriculum in secondary schools would be enhanced.

- The study also recommends that secondary school principals need to develop transformationmal leadership qualities. These qualities may enable them to overcome the transformationmal leadership challenges such as enabling active participation for all, helping school members of staff and the community at large realise ICT dreams, encouraging dissemination and collaboration with teachers, transform teachers posted in their schools into experts in implementing ICT given the prevailing environment, transform individuals into teams that support working through eventual problem to make them engage and adopt pedagogical changes, production of ICT-based curriculum material resources and learning to design curriculum materials to foster development of TPACK and to make rational decisions when selecting the right technology for their school needs. When schools develop transformational leadership capabilities, they can transform teachers in teams of experts useful in effective ICT based curriculum implementation for improved teaching and learning through ICT across all the subjects and life activities for students. This is because such leaders will have the understanding that no one person can do it all, that the people they surround themselves with and how they manage them are the keys to their success.

- It was also recommended that there is need to develop and make use of instructional leadership. This can help in overcoming the challenges experienced in areas such as provision of relevant devices for all teachers and learners to use to support teaching and learning; simplify the complex, integrated process, involving school community procedures, ideas, devices and organisation for analysing problems and devising implementation and evaluation and managing solutions to the problems in situations where learning is purposive and controlled; the principal is able to draw appropriate ICT applications to enhance personal and professional effectiveness; develop school procedures and process for supporting the operation of ICT infrastructure; making choices and identifying best fit ICT for a particular school culture and setting and deciding appropriate technology sensitivity to the school population, physical structures and practices. If developed and adequately and effectively used, instructional leadership may help the schools to develop strategies and tools that are critical for theory and practical teching and learning to bring life and live to classrooms thereby helping in implementation of ICT based curriculum into teaching and learning process.

- In addition to that, the other recommendation was to ensure that there is effective application of ICT change agility leadership. This can help the sampled secondary schools and any other similar school to deal with the challenges in areas such as reviews process, assesses and leads to enhanced schools agility and operational capability to respond effectively to opportunities or challenges; makes technological resources current and up to date; provide leadership that selects and frame important

initiatives; full understanding the perspectives held by differing stakeholders and how fully they create greater alignment with them; solving complex, novel problems; use of experience in learning; leading institutional change, leading teams, and engaging in pivotal conversations; possession of and being an expert, achiever, catalyst, co-creator, and synergist and creating an environment that enhance changing mindsets and attitudes; reformed teaching and learning culture; underestimation of complexity; minimize shortage of resources; motivate high level of commitment; improve change agile know-how and motivation of involved academic and not academic staff. This is useful in enhancing the understanding the rate and pace of ICT change, know the shortcomings from the rapid changes and recognizing them thereby building current and uptodate ICT environment that will enhance implementation of ICT based curriculum.

5.3 Suggestions for Further Studies

The literature reviewed by this study had weaknesses on the ICT implementation as there is lack of empirical findings on stages and levels of ICT implementation. This study also is limited on its findings where it was out of its objectives the influence of gender, age education and experience on ICT implementation leadership. Therefore it is important for further studies to explore an extensive study on the influence of these demographic variables on the leadership in implementing ICT in schools.

The other area is making ICT a mandatory element of teaching across the subjects in schools. It is also important for future studies to investigate the relationship of a mandatory policy to public school principals and the implementation of ICT in schools.

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LIST OF APPENDICES

APPENDIX I: TARGET POPULATION AND SAMPLING FRAME

S/No	Name of School	Nature	ICT Evidence
1.	A.	Girls Boarding	High
2.	B.	Girls Boarding	High
3.	C.	Boys Boarding	Low
4.	D.	Boys Boarding	Zero
5.	E.	Mixed Day & Boarding	Moderate
6.	F.	Mixed Day & Boarding	Zero
7.	G.	Mixed Day	Low
8.	H.	Mixed Day	High
9.	I.	Mixed Day	High
10.	J.	Boys Boarding	High
11.	K.	Girls Boarding	High
12.	L.	Girls Boarding	Low
13.	M.	Mixed Day	Low
14.	N.	Mixed Day	Low
15.	O.	Mixed Day	Low
16.	P.	Boys Boarding	Low
17.	Q.	Boys Boarding	Moderate
18.	R.	Boys Boarding	Moderate
19.	S.	Girls Boarding	Moderate
20.	T.	Boys Boarding	Moderate
21.	U.	Girls Boarding	Moderate
22.	V.	Girls Boarding	Moderate
23.	W.	Girls Boarding	Moderate
24.	X.	Girls Boarding	Moderate
25.	Y.	Girls Boarding	Moderate
26.	Z.	Boys Boarding	Moderate
27.	AA.	Girls Boarding	Moderate
28.	BB.	Mixed Day	Moderate
29.	CC.	Mixed Day	Moderate
30.	DD.	Mixed Day	Moderate
31.	EE.	Mixed Boarding	Low
32.	FF.	Mixed Day	Low
33.	GG.	Boys Boarding	Low
34.	HH.	Boys Boarding	Low
35.	II.	Boys Boarding	Low
36.	JJ.	Girls Boarding	Low
37.	KK.	Boys Day	Low
38.	LL.	Mixed Day	Low
39.	MM.	Girls Boarding	Low

40.	NN.	Mixed Day	Low
41.	OO.	Girls Boarding	High
42.	PP.	Girls Boarding	High
43.	QQ.	Mixed Day	High
44.	RR.	Girls Boarding	High
45.	SS.	Mixed Day	High
46.	TT.	Girls Boarding	High
47.	UU.	Girls Boarding	High
48.	VV.	Girls Boarding	High
49.	WW.	Boys Boarding	High
50.	XX.	Mixed Boarding	High
51.	YY.	Mixed Day	High
52.	ZZ.	Mixed Boarding	High
53.	AAA.	Mixed Boarding	High
54.	BBB.	Mixed Boarding	High
55.	CCC.	Mixed Day	Moderate
56.	DDD.	Boys Boarding	Moderate
57.	EEE.	Girls Boarding	Moderate
58.	FFF.	Boys Boarding	Moderate
59.	GGG.	Girls Boarding	Moderate
60.	HHH.	Mixed Boarding	Moderate
61.	III.	Boys Boarding	Moderate
62.	JJJ.	Mixed Day	Moderate
63.	KKK.	Mixed Day	Moderate
64.	LLL.	Boys Boarding	Moderate
65.	MMM.	Girls Boarding	Moderate
66.	NNN.	Girls Boarding	Moderate
67.	OOO.	Mixed Day	Moderate
68.	PPP.	Mixed Boarding	Moderate
69.	QQQ.	Girls Boarding	Moderate
70.	RRR.	Mixed Boarding	Moderate
71.	SSS.	Boys Boarding	Moderate
72.	TTT.	Boys Boarding	Moderate
73.	UUU.	Mixed Day	Moderate
74.	VVV.	Mixed Boarding	Moderate

APPENDIX II: KREJCIE AND MORGAN TABLE (1970)

Population	Sample	Population	Sample	Population	Sample
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10 000	370
150	108	750	254	15 000	375
160	113	800	260	20 000	377
170	118	850	265	30 000	379
180	123	900	269	40 000	380
190	127	950	274	50 000	381
200	132	1000	278	75 000	382
210	136	1100	285	1 000 000	384
Population	**Sample**	**Population**	**Sample**	**Population**	**Sample**

APPENDIX III: LIKERT SCALE QUESTIONNAIRE FOR SCHOOL PRINCIPALS

SECTION A: DEMOGRAPHIC INFORMATION OF RESPONDENTS

Please help me fill this form by selecting the most appropriate choice as provided where necessary.

1. What is your age bracket in years?
   - Below 20 ( )
   - 21- 30 ( )
   - 31- 40 ( )
   - 41- 50 ( )
   - Above 50 ( )

2. What is the most current level of your education?
   - Certificate ( )
   - Diploma/Higher Diploma ( )
   - Degree ( )
   - Masters Degree ( )
   - Others (Specify)……..

3. What is your gender?
   - Male ( )
   - Female ( )

4. How long have you been to this current post?
   - Recently appointed ( )
   - Less than 1 year ( )
   - 1-3 years ( )
   - 4-6 years ( )
   - 6-above years ( )

SECTION B: QUESTIONNAIRE ON ICT IMPLEMENTATION IN SCHOOL

5. Is this school uses ICT curriculum in its teaching across all subjects?
   - Yes ( )
   - No ( )

6. Has the school established an environment for ICT curriculum implementation?
   - Discetionary ( )
   - Compulsory ( )

7. What stages of ICT implementation do you consider your school in?
   - Entry ( )
   - Adoption ( )
   - Adaptation ( )
   - Appropriation ( )
   - Innovation ( )

8. What is the level of ICT Implementation at this School?

Beginning	( )
Advance	( )
Creative and Innovation	( )
Problem Solving	( )

9. Which ICT Enabling Environment has been provided in your Secondary Schools?

1……
2……
3……
4……
5……
6. ……

10. Which ICT Skills and Knowledge are taught in this School?

Basics	( )
Advances	( )
Creative and innovation	( )
Problem solving	( )

11. Is there a policy plan for ICT implementation in the school?

There is a clear vision to Implement ICT	( )
There is a clear mission guiding ICT implementation	( )
There are clear and achievable ICT Implementation goals	( )
Not Sure	( )

12. Please state the level of agreement with the following statements (Strongly Agree= 5- Strongly Disagree= 1)

	Statement	**SA**	**A**	**N**	**D**	**SD**
1.	The School teaches Information and ICT Skills Concurrently; Subject Meetings Where Teachers Can Share Knowledge and Experience The School teaches Information and ICT Skills Concurrently; Subject Meetings Where Teachers Can Share Knowledge and Experience					
2.	We provide subject resource that show how ICT can be integrated and enhance learning					
3.	School Management has developed policies that outline educational needs					
4.	The School Leadership has always Assist Teachers to Follow Agreed upon Policy					
5.	The School Leadership develops a shared vision; asserting information leadership; build policy based on the vision; develop implementation plan with detail					
6.	Staff development in ICT implementation skills and Instructional Leadership					

7.	The School has a Developed Vision and a Policy on ICT Implementation					
8.	Communicate what information leadership is and translates this into policy and practice					
9.	The leadership develop Peer coaching model; policy encourages professional development; make budget available for professional development in ICT					
10.	Encourage Instructional Leadership Adding Best Practices					

SECTION C: QUESTIONNAIRE ON EDUCATIONAL TECHNOLOGY LEADERSHIP

13. The School Using ICT Systems in Technological Leadership

Yes ( )
No ( )

Identify the degree of Instructional Leadership in your institution

Very Poor ( )
Very Good ( )
Good ( )
Excellent ( )
None Above ( )

14. Please state the level of agreement with the following statements (Strongly Agree= 5- Strongly Disagree= 1)

	Statement	**SA**	**A**	**N**	**D**	**SD**
1.	Provide Tools to generate course materials for teachers and learners					
2.	Planning and organizational tools for concept mapping and lesson planning					
3.	Electronic research and reference tools to support specific areas					
4.	Tools to record class teaching and learning process and notes					
5.	Tools for delivering content to learners, assessing and creating documents using specific ICT programs					
6.	Application of more advanced ICT uses to create multimedia broadcast online					
7.	Using ICT as a tool or a means to creating the end results and not the focus of the lesson					
8.	Using a graphing calculator in science courses for learners to create graphs such as maths, physics, or chemistry graphs					

SECTION D: QUESTIONNAIRE ON TRANSFORMATIONAL LEADERSHIP

15. Please state the level of agreement with the following statements (Strongly Agree= 5- Strongly Disagree= 1)

	Statement	**SA**	**A**	**N**	**D**	**SD**
1.	Enabling Active participation for all					
2.	Helping school members of staff and the community at large realise ICT dreams					
3.	Encouraging dissemination and collaboration with teachers					
4.	Transform teachers posted in their schools into experts in implementing ICT given the prevailing environment					
5.	Transform individuals into teams that support working through eventual problem to make them engage and adopt pedagogical changes					
6.	Production of ICT-based curriculum material resources					
7.	Learning to design curriculum materials to foster development of TPACK and to make rational decisions when selecting the right technology for their school needs					

SECTION E: INSTRUCTIONAL LEADERSHIP

16. Please state the level of agreement with the following statements (Strongly Agree= 5- Strongly Disagree= 1)

	Statement	**SA**	**A**	**N**	**D**	**SD**
1.	Provision of Relevant devices for all teachers and learners to use to support teaching and learning					
2.	Simplify the complex, integrated process, involving school community procedures, ideas, devices and organisation for analysing problems and devising implementation and evaluation and managing solutions to the problems in situations where learning is purposive and controlled					
3.	The principal is able to draw appropriate ICT applications to enhance personal and professional effectiveness					
4.	Develop school procedures and process for supporting the operation of ICT infrastructure					
5.	Making choices and identifying best fit ICT for a particular school culture and setting					
6.	Deciding appropriate technology sensitivity to the school population, physical structures and practices					

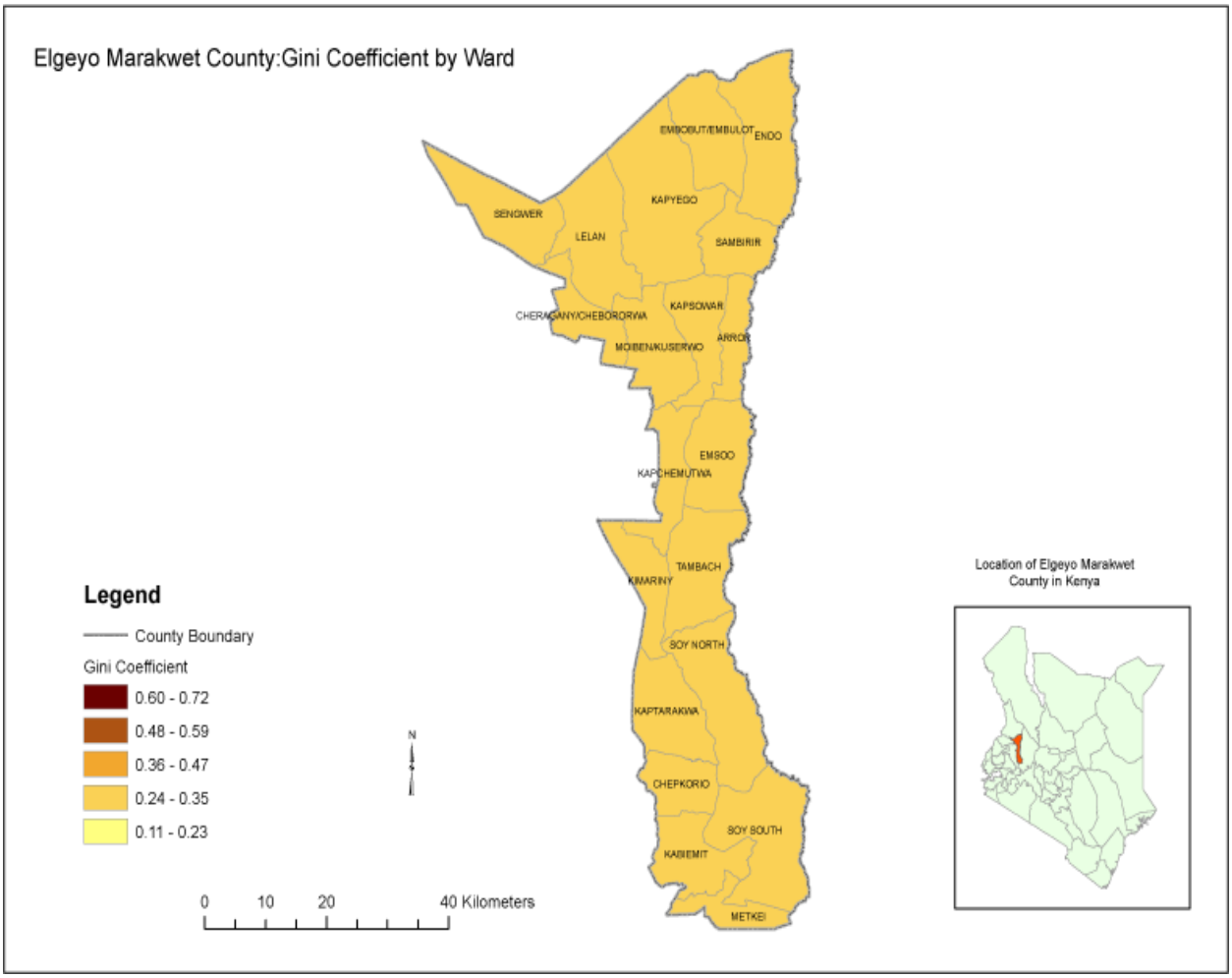
SECTION F: QUESTIONNAIRE ON ICT CHANGE AGILITY LEADERSHIP

17. Please state the level of agreement with the following statements (Strongly Agree= 5- Strongly Disagree= 1)

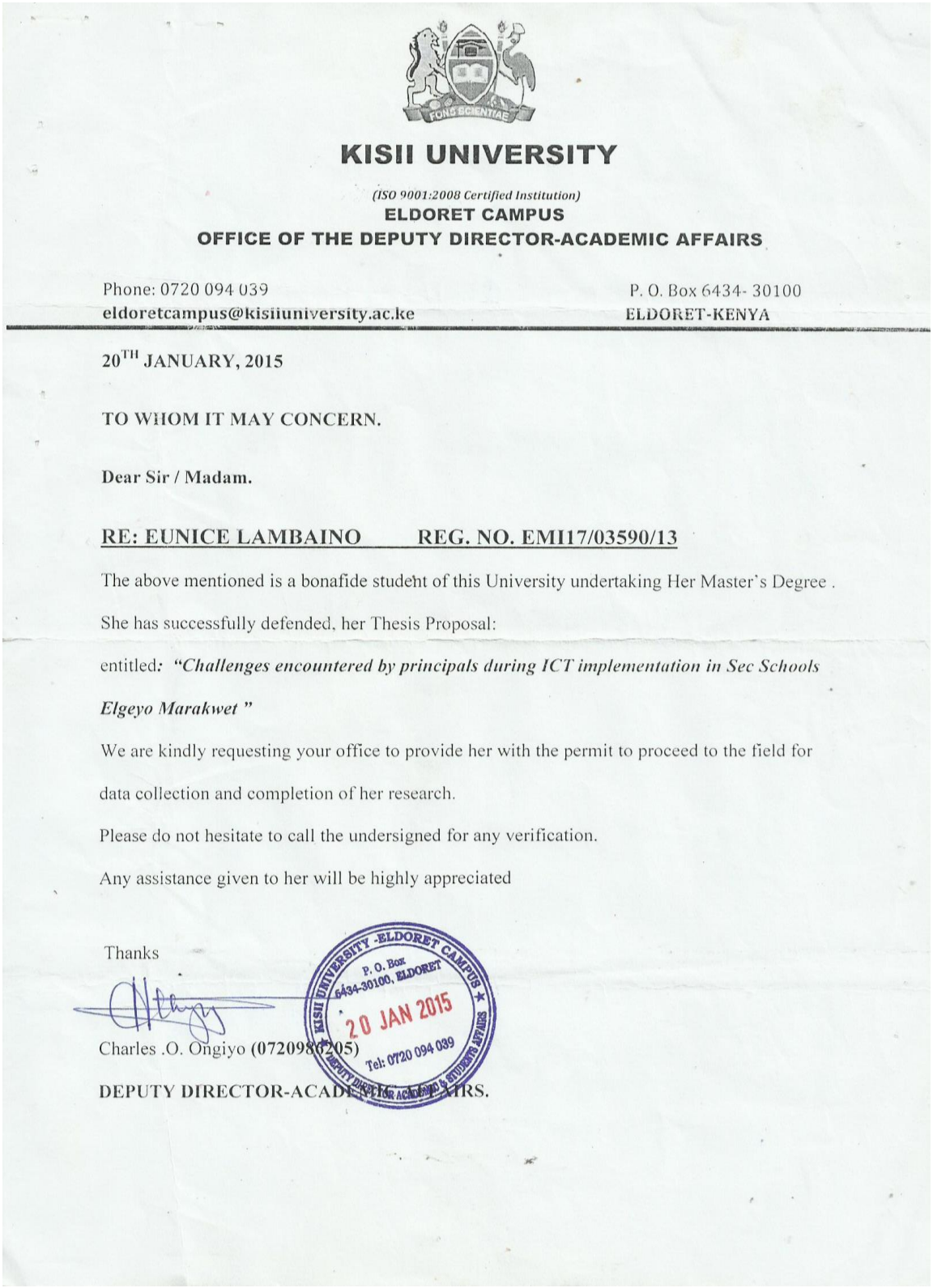
	Statement	**SA**	**A**	**N**	**D**	**SD**
1.	Reviews process, assesses and leads to enhanced schools agility and operational capability to respond effectively to opportunities or challenges					
2.	Makes technological resources current and up to date					
3.	Provide leadership that selects and frame important initiatives; full understanding the perspectives held by differing stakeholders and how fully they create greater alignment with them; solving complex, novel problems; use of experience in learning					
4.	Leading institutional change, leading teams, and engaging in pivotal conversations					
5.	Possession of and being an expert, achiever, catalyst, co-creator, and synergist					
6.	Creating an environment that enhance changing mindsets and attitudes; reformed teaching and learning culture; underestimation of complexity; minimize shortage of resources; motivate high level of commitment; improve change agile know-how and motivation of involved academic and not academic staff					

Thank you for your time and Cooperation to participate in this Study.

Appendix IV: Map of Elgeyo Marakwet County



APPENDIX V: LETTER OF AUTHORIZATION



KISII UNIVERSITY

(ISO 9001:2008 Certified Institution)

ELDORET CAMPUS

OFFICE OF THE DEPUTY DIRECTOR-ACADEMIC AFFAIRS

Phone: 0720 094 039 P. O. Box 6434- 30100
eldoretcampus@kisiiuniversity.ac.ke ELDORET-KENYA

20TH JANUARY, 2015

TO WHOM IT MAY CONCERN.

Dear Sir / Madam.

RE: EUNICE LAMBAINO REG. NO. EMI17/03590/13

The above mentioned is a bonafide student of this University undertaking Her Master's Degree . She has successfully defended, her Thesis Proposal:

entitled: *"Challenges encountered by principals during ICT implementation in Sec Schools Elgeyo Marakwet "*

We are kindly requesting your office to provide her with the permit to proceed to the field for data collection and completion of her research.

Please do not hesitate to call the undersigned for any verification.

Any assistance given to her will be highly appreciated

Thanks

KISII UNIVERSITY -ELDORET CAMPUS P. O. Box 6434-30100, ELDORET 20 JAN 2015 Tel: 0720 094 039 DEPUTY DIRECTOR ACADEMIC AFFAIRS & STUDENTS AFFAIRS

Charles .O. Ongiyo (0720986205)

DEPUTY DIRECTOR-ACADEMIC AFFAIRS.

APPENDIXVI: LETTER FROM THE MINISTRY

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
2241349, 310571, 2219420
Fax: +254-20-318245, 318249
Email: secretary@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

Date:
30th July, 2015

NACOSTI/P/15/3546/6064

Eunice Lambaino
Kisii University
P.O. Box 402-40800
KISII.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Challenges encountered by principals during ICT implementation in secondary schools Elgeyo Marakwet County,"*** I am pleased to inform you that you have been authorized to undertake research in **Elgeyo Marakwet County** for a period ending **4th September, 2015.**

You are advised to report to **the County Commissioner and the County Director of Education, Elgeyo Marakwet County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. S. K. LANGAT, OGW
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Elgeyo Marakwet County.

The County Director of Education
Elgeyo Marakwet County.

National Commission for Science, Technology and Innovation is ISO 9001: 2008 Certified

APPENDIX VII: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MISS. EUNICE LAMBAINO
of KISII UNIVERSITY, 418-30700
ITEN,has been permitted to conduct
research in *Elgeyo-Marakwet County*
on the topic: *CHALLENGES ENCOUNTERED BY PRINCIPALS DURING ICT IMPLEMENTATION IN SECONDARY SCHOOLS ELGEYO MARAKWET COUNTY*
for the period ending:
4th September,2015

Permit No : NACOSTI/P/15/3546/6064
Date Of Issue : 30th July,2015
Fee Recieved :Ksh 1,000

.....
Applicant's Signature

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A 6002

CONDITIONS: see back page

APPENDIX VIII: LETTER TO CONDUCT RESEARCH TO SCHOOLS PRINCIPALS

Dear Participant

You are invited to participate in a study project aimed at investigating on ***leadership challenges faced by school principals when implementing ICT-based curriculum and instructions in secondary schools in Elgeyo Marakwet County***.

This information will give better insight into the current state of ICT implementation at public secondary schools in Elgeyo Marakwet County. This study is being conducted under the supervisions of Dr. Koross Rachel and Prof Kimani Chege at the Faculty of Education in Kisii University. Your participation in this research project is voluntary and confidential. At no time will the name of any school or individual be identified. While results will be made available by school, you are guaranteed that neither your school nor your name will be identified in any report of the results of the study.

If you have any questions concerning the research study, please do not hesitate to call me at: +254721704842.

Yours sincerely,

Eunice Lambaino

Appendix IX: LIKERT SCALE RESULTS ANALYSIS

Level of ICT Based Curriculum Implementation Indicators Analysis

	1	2	3	4	5	(∑XY)	(∑XY)/n
1.	30	36	27	44	14	**151**	**2.475**
2.	70	8	39	40	13	**170**	**2.787**
3.	55	56	27	26	15	**179**	**2.935**
4.	40	48	33	24	19	**164**	**2.689**
5.	60	36	21	38	14	**169**	**2.77**
6.	45	44	30	38	13	**170**	**2.787**
7.	60	36	18	34	17	**165**	**2.705**
8.	55	44	21	34	15	**169**	**2.77**
9.	50	36	30	36	10	**162**	**2.656**
10.	85	24	39	32	10	**190**	**3.115**
Grand Score							**2.769**

Where X =Frequency Score of Respondents; Y= 5-Points of Likert Scale (1, 2, 3, 4 and 5)

Educational Technology Leadership Results Analysis

	1	2	3	4	5	(∑XY)	(∑XY)/n
1.	12	66	21	40	0	**139**	**2.28**
2.	37	20	0	56	0	**113**	**1.85**
3.	48	28	0	0	0	**76**	**1.25**
4.	42	28	0	24	0	**94**	**1.54**
5.	42	22	27	0	0	**91**	**1.49**
6.	52	18	0	0	0	**70**	**1.15**
7.	32	50	15	0	0	**97**	**1.59**
8.	56	10	0	0	0	**66**	**1.08**
Grand Score							**1.53**

Where X =Frequency Score of Respondents; Y= 5-Points of Likert Scale (1, 2, 3, 4 and 5)

Transformational Leadership Results Analysis

	1	2	3	4	5	(∑XY)	(∑XY)/n
1.	39	30	0	24	5	**98**	**1.61**
2.	42	24	21	0	0	**87**	**1.43**
3.	59	4	0	0	0	**63**	**1.03**
4.	52	14	0	8	0	**74**	**1.21**
5.	38	18	21	28	0	**105**	**1.72**
6.	13	60	37	24	10	**144**	**2.36**
7.	23	42	0	48	30	**143**	**2.35**
Grand Score							**1.67**

Where X =Frequency Score of Respondents; Y= 5-Points of Likert Scale (1, 2, 3, 4 and 5)

Instructional Leadership Results Analysis

	1	2	3	4	5	(∑XY)	(∑XY)/n
1.	34	24	0	60	0	**118**	**1.94**
2.	29	44	30	4	0	**107**	**1.75**
3.	31	40	30	0	0	**101**	**1.66**
4.	51	20	0	0	0	**71**	**1.16**
5.	22	26	30	36	40	**154**	**2.53**
6.	20	36	42	36	25	**159**	**2.61**
Grand Score							**1.94**

Where X =Frequency Score of Respondents; Y= 5-Points of Likert Scale (1, 2, 3, 4 and 5)

ICT Change Agility Leadership Results Analysis

	1	2	3	4	5	(∑XY)	(∑XY)/n
1.	41	28	15	4	5	**93**	**1.53**
2.	24	74	0	0	0	**98**	**1.61**
3.	21	62	9	24	0	**116**	**1.9**
4.	51	20	0	0	0	**71**	**1.16**
5.	42	30	3	4	10	**89**	**1.46**
6.	40	30	18	0	0	**88**	**1.44**
Grand Score							**1.52**

Where X =Frequency Score of Respondents; Y= 5-Points of Likert Scale (1, 2, 3, 4 and 5)

APPENDIX X: SAMPLE CORRECTION REPORT OF PLAGIARISATION OF THE THESIS

INSTRUCTIONS_IN_SECONDARY_SCHOOLS_IN_ELGEYO_...

ORIGINALITY REPORT

19%	14%	4%	11%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	epublications.uef.fi Internet Source	1%
2	iosrjournals.org Internet Source	1%
3	roggkenya.org Internet Source	1%
4	Submitted to Masinde Muliro University of Science and Technology Student Paper	1%
5	Submitted to Mount Kenya University Student Paper	1%
6	www.tandfonline.com Internet Source	1%
7	Submitted to Midlands State University Student Paper	1%
8	pdfs.semanticscholar.org Internet Source	1%
9	www.schoolnet.org.za	

	Internet Source	1%
10	Submitted to HotChalk Inc Student Paper	<1%
11	Submitted to Higher Education Commission Pakistan Student Paper	<1%
12	Submitted to University of Johannsburg Student Paper	<1%
13	www.scribd.com Internet Source	<1%
14	www.cited.org Internet Source	<1%
15	repository.out.ac.tz Internet Source	<1%
16	Submitted to The University of Fiji Student Paper	<1%
17	www.slideshare.net Internet Source	<1%
18	docplayer.net Internet Source	<1%
19	repository.unam.edu.na Internet Source	<1%
	Submitted to Federal University of Technology	