Development Communication in Education: An analysis of eLearning in selected schools in Nairobi County.

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DECLARATION

This research is my original work and has not been submitted for award of any degree at the University of Nairobi or any other university.

Signed…………………………………………………..**Date**…16th October 2015………

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This research project has been submitted for examination with my approval as the university supervisor.

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DEDICATION

To my parents, Jane Wanjira Ngugi and the Late Elijah Ngugi Ndagui whose guidance and love pushed me to realize my dreams. Not forgetting my siblings who shed brilliant ideas, critic and support in my academic studies.

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ABBREVISTIONS AND ACRONYMES

APP	-	American Academy of Pediatrics
ECDE	-	Early Childhood Development Education
DFID	-	Department for International Development
ICT	-	Information Communication and Technology
LDC	-	Least Developed Countries
LMS	-	Learning Management Systems
KICD	-	Kenya Institute of Curriculum Development
KLB	-	Kenya Literature Bureau
KNEC	-	Kenya National Examination Council
MDG	-	Millennium Development Goals
NCC	-	Nairobi City County
NGO	-	Non-Governmental Organization
MoEST	-	Ministry of Education Science and Technology
OUP	-	Oxford University Press
PPP	-	Public Private Partnership
SDG	-	Sustainable Development Goals
USAID	-	United States Agency for International Development
UNECA	-	United Nations Economic Commission for Africa
UNESCO	-	United Nations Educational, Scientific and Cultural Organization

ABSTRACT

This study is about development communication in education, with special focus on eLearning in selected schools within Nairobi County. Generally, the study aimed at interrogating eLearning in schools while taking a closer look at its contribution towards enhancing education communication and delivery. The study was guided by four research objectives, namely, to establish the role of eLearning in education. To determine the availability, access and use of eLearning materials in schools in Nairobi County. To explore the influence of eLearning to standard classroom-based learning and education delivery in Nairobi County. Finally, to interrogate the appropriate solutions to the challenges facing eLearning uptake in schools. This study used a sample of 135 respondents comprising 10 key informants/experts in education matters, 65 teachers and parents/guardians and 60 learners in both primary and secondary in selected schools within three district sampled from the county. The study used non-probability and probability sampling procedures, adopting purposive and simple random sampling methods. The study used a mixture of qualitative and quantitative research techniques that comprised collection of data using instruments such as questionnaires, key informant interviews and focus group discussions. Data is presented in charts, graphs, photographs and direct verbatim quotations from respondents. Data is analyzed systematically. Principal finding of the study indicated that a majority of stakeholders acknowledged eLearning is very useful for learning purposes. 80% of respondents understood the potential benefits of eLearning while 20% didn't. Even so, a majority of respondents felt the access levels to eLearning facilities in schools are at less than 5%, confirming existence of a significant mismatch on perception and the situation on the ground regarding eLearning in schools. Findings also indicated secondary school learners used eLearning devices mostly to access social media sites and search engines more than educational course content. On the other hand, primary school pupils use devices to play games and get entertainment. There is also a negative mindset among some key stakeholders in government and the public regarding eLearning it schools. This is largely attributed to the limited awareness campaigns and/or negative publicity (*politicization*) of education issues. There was also lack of a proper eLearning implementation model and curriculum, affecting negatively the adoption of eLearning in schools. In addition, most public schools lack or have inadequate eLearning facilities. Further the study found out that curiosity in most learners drove them to use estate cyber cafes and/or borrow their parent's gadgets or friends to practice computer skills whilst unmonitored. This exposed them to greater risks when online. The findings of the study led to conclusions that, eLearning plays a vital role in the provision of education services. It is fast becoming an important aspect of all educational systems as the most cost-effective way of providing a *'democratized'* education. There is also significant knowledge on eLearning and its import to education delivery. In addition, *'Gamified' learning* for children could make learning interesting thus yielding positive outcomes in class. This study recommends that, there should be an implementable robust eLearning policy in place, teachers to be equipped with relevant competencies in ICTs for learning, provision of appropriate eLearning infrastructure and devices to learners. In addition, the government should provide adequate support for local digital content development. Finally, the government should conduct more awareness campaigns on eLearning in schools.

CHAPTER ONE: INTRODUCTION

1.0 Background of the study

In many countries, national development tenets aim at empowering its human capital through quality education. Therefore, an education system must ensure leaner's acquire the relevant knowledge and skills needed to promote sustainable socio-economic development[1] in a country. In light of this, developing countries should strive to realise upward trajectory in human development through provisions of readily accessible, equitable and quality education. Moemeka (1996, pp. 6-8) argues that the use of communication media has been shown to lead to positive and effective development behaviour. This notwithstanding, effective use of ICTs (computing devices/media) for educational purposes make eLearning a reality in most educational processes leading to new opportunities for transformative and effective learning in the standard-classroom setting education delivery.

The Government of Kenya through the Vision 2030 development blueprint under the social pillars, underscores education and training as the vehicles that will drive the country into becoming a middle income economy that is able to compete globally and contribute positively towards social change. Bindra (2014) argues that everything starts with education, which is the single biggest factor that will determine whether a country becomes a proper developed economy, or just a fantasising one. Sustainability of development therefore becomes pegged on human capital with relevant skills and mindset.

In the Sessional Paper No 14 of 2012, the Government of Kenya commits to; mobilize funds to ensure that all schools adapt ICT facilities to support the learning process, to revise the curriculum in order to make it competency based and integrate ICTs

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[1] United Nations Sustatinble Development Goals. Goal No. 4: Education, *Target 4.7.* https://sustainabledevelopment.un.org [Available online]. Accessed September 10, 2015.

in the education system. The aim of this government's policy directive is to equip Kenya's human capital through education, with the necessary skills in the 21st Century information age enabling them become responsible global citizens who contribute responsibly towards humanity and development.

The Kenya Constitution of 2010 has provisions that recognize education as a basic human right that every Kenyan is entitled to. Further, the constitution, has provisions for free and compulsory education for every Kenyan child under Article 53 1 (b). This presents a reference point for government investments in education in terms of; legislations, policy and curriculum. In addition, the Government of Kenya is also signatory to international covenants. For instance, the 1948 Universal Declaration of Human Rights, the 1959 Declaration of the Rights of the Child and the 1966 International Covenant on Economic, Social and Cultural Rights, provide a framework for the global commitments towards education and equality of opportunity (Meyer 2014). Therefore, commitments to increasing the social and economic opportunities for its citizens through quality access to basic education, stands out as a catalyst to national development.

Access to equitable and quality education contributes towards the realisation of national development goals. The starting point should be the individual self-actualisation, which then progressively impacts on society upward trajectory through the desired social change. ICT in education in this 21st Century provide capabilities that support learning processes. This is through increased effective and efficient use and access to high quality knowledge and information.

Court *et al* (1974) argues that, education is both an end in itself and a means of attaining other ends. This makes quality education stands out as critical component for sustainable knowledge, information acquisition and growth, which are important to development agendas of a country. In light of this, education sector is expected to provide the necessary skilled human capital ideal to spur development in a country.

Communication in the pedagogy of Paulo Freire (1970) envisions one that is of a transformative process aiming at realising social change. Education plays a critical role in this kind of social transformation. To this end, effective utilization of technological innovations in the education sector need cross-sectoral collaboration and multi-stakeholder approach in order to realise the national goals for development in LDCs (Mensah 2014, p.38 & Ndemo 2015). Countries need to have workable plans to have relevant learning environment that will spur innovations in all sectors of economy.

Bill Gates (2015) posits that cheaper devices and software with better network will revolutionise the way children in developing countries learn over the next 15 years. This statement is in agreement with eLearning pedagogy. Electronic learning (eLearning) is proposed as one of the main ways of addressing some of the key challenges in delivery and access to education such as the traditional barriers to education delivery, time constraints, entrance requirements, geographical distances, socio-economic, cultural and gender issues (Omwenga *et al* 2004, p.35). The above continue to inhibit outcomes of an education system especially in LDC, hence a need to address the foundation of sustainable development.

The integration of ICTs in education ushered in the advent of eLearning, which has transformed education sector globally, strengthening the eLearning environment and culture. Credit is given to the growth in internet usage, growing content sector and bandwidth increase among other innovations in the computing world (Mensah 2014, pp 35-39). In spite of ubiquitous technologies, eLearning is majorly about learning and not the technologies thereof. It is an empowering tool to the learner as well as the teacher (Knight 2004).

This notwithstanding, eLearning appears to compete with standard-classroom based learning by way of transforming the classroom setting with provisions of an alternative to the standard lecture format—teacher to student (banking method) thus, giving learners an

immense and instantaneous opportunity to access a wealth of quality interactive learning resources and tools (JKUAT 2015). However, it is the view of the researcher that eLearning can as well be argued that it complements standard-classroom setting by enhancing efficiency and effectiveness of the learning process as opposed to competition of modes of education delivery widely in use today.

ELearning envisioned as the almost unlimited access to knowledge, information and global communication offered by the ICTs present a new paradigm in realising quality and equity in the education system for sustainable development. It also fundamentally presents the phenomenon of open and lifelong learning where the role of the teacher is shifted to being a facilitator in a participatory learning environment. The interactivity, motivation, flexibility, collaboration among other unique capabilities of eLearning technology make learning an active process where actors, that is both the teacher and the student become participants towards transformative life-long social change. This means, the teacher learns from the student and vice versa in a democratic way (Moemeka, 1996).

The taskforce report for the Education sector of Nairobi City County (2014) pinpoints technology as a key factor of production. ICTs in education where eLearning falls, play critical role in enhancing access to, and quality of education delivery, which entails effective teaching and learning. Exploring eLearning as catalysts to sustained development in Kenya with closer look at the Nairobi City County as the case study intends to provoke national education sectoral debate regarding the ideal learning process for sustainable development of a society and reinforce policy in the education sector.

1.1. Statement of the problem

Since attaining her independence from colonial rule over 50 years ago, the country continues to fight same issues it targeted namely; eradicating poverty, ignorance and disease. The standard class room setting of teacher to student learning or top-down banking

method of education delivery adopted then and still in use today has proved to have limited options in addressing the above mentioned national challenges. Haddad *et al* (1990, p.3) asserts that there is persuasive theoretical and empirical evidence linking investments in formal education and training of labour force to economic development. The mode of education delivery in developing countries borrows heavily from the colonial imperialistic ideologies that continue to produce a human capital with limited or inadequate critical conscience that has been contributing to underdevelopment in most LDCs (Freira, 1970).

Otiende *et al* (1992, pp. 107-108) highlights the efforts the government has been putting in a bid to make the education system a catalyst to national development. The aims and objective of the Kenyan education sector since independence have been consistent. Key among them being serving the needs of national development and fostering national cohesion. In the Sessional paper number 10 of 1965, education is perceived as more of an economic than a social science, hence linking education to economic growth and is incorporated in the development plans. These commissions, committees and international covenants have had limited impacts on development (Otiende *et al* 1992). However they were efforts to try and address the various issues that would contribute towards uplifting the social economic status of the citizenry. For example, International Labour Organisation (ILO) in 1972 proposed junior secondary school should prepare students for agriculture, budgeting, family welfare and community development. Gachathi Committee of 1976, was tasked to define a new set of educational goals. Ndegwa Commission of 1978 emphasised on economic and nation building functions of education. It also stressed on the need to raise the quality of teacher education in order to improve the quality of primary education. This developments in education system saw a change from the 7-3-2-3 system of education to 8-4-4 which attempts to instill the values of cooperation and social responsibility in students (Otiende *et al,* 1992, pp.152-159). The above, presents evidence of efforts to address the challenges of an education system aimed at national development.

ELearning capabilities enhance education delivery opportunities opening up the closed education system in Kenya by allowing the actors to responsibly share and learn from a wide range of information and knowledge readily available thanks to the advents in computing technologies. Mensah (2014, p. 36) and Ndung'u (2015) highlight the import of eLearning initiatives in some developing countries which are helping to solve some of the learning and skills crisis bedevilling the education sector for years, for example, *Kindle e-readers* in Ghana and the *kytabu* platform in Kenya are helping address the chronic shortage of school learning materials such as textbooks and story books in institutions of learning. Ndemo (2015) illustrates how non-profit online educational organisation – *Khan Academy* improved his son's understanding of seemingly complex mathematic subject in high school. These among other success stories about eLearning if explored through localised platforms can make our education system be the one that transforms learning into a lifelong experience and a catalyst to sustainable development.

Since its inception in the 1990s, especially the internet technologies, eLearning stands out as a gradual trend towards democratization of an education system (Mensah 2014, p 37). It creates a learning environment characterised by unlimited access, use and dissemination of information and knowledge which is a catalyst to positive social change. The global communication phenomenon offered by eLearning, present a new paradigm of open and lifelong learning that has been lacking in the standard-classroom based education delivery still in use today (Ndemo, 2015). ELearning makes it possible to achieve the universal goal of education for all by providing a means for overcoming traditional barriers to education in the developing countries.

However, various issues continue to bedevil the uptake of these transformative technologies. For instance, An inadequate regulator, inadequate local digital content, luddite publishers, the ever dynamic nature of computing technologies, high costs, e-waste management, digital divide, computer illiteracy and technophobia among users, strongly

stand as some of the issues impeding adoption of eLearning. Therefore, it is important to underscore the inherent features of eLearning as an important tool to effective education.

It is from this argument that a need for concerted efforts towards modifying the education system and make it responsive to the local demands of an ideal human capital for sustainable development. Moreover, prepare it to contribute positively to the increasingly globalised world, utilizing the unlimited sources of useful knowledge and information that enable localised solutions and innovations that enhance national transformation.

In the Sessional Paper No 14 of 2012, the government commits to mobilize funds to ensure that all schools adapt ICT facilities to support the learning process, to revise the curriculum in order to make it competency based and integrate ICTs in the education system. This is an important move by the previous and the current government as a way to maximally utilize the importance of ICTs in transforming learning, learners and the teachers in the education sector. However, there are limited achievements. The impact of eLearning in the education system is inadequate in spite of the elaborate sessional papers and policy frameworks that give the government the right to prioritise ICTs infrastructure to support the education sector making it responsive to sustainable development.

ELearning exploits the interactive technologies and mass communication systems to improve the learning experience. Knight (2004) points out six dimensions of this technologies that is revolutionising learning, firstly, connectivity resents the unlimited immediate access to information that is available on a global scale. Secondly motivation aspect through the multimedia resources can make learning resourceful as well as fun. Thirdly flexibility makes it possible for learning to take place any time at any place. Fourthly, interactivity makes assessment of learning immediate and autonomous. Fifthly, collaboration introduces participatory engagements through the use of discussion tools that

support learning beyond the classroom and as well as lifelong learning. Lastly, extended opportunities allow an extension of classroom-based learning through innovations such as portable wireless computing devices that facilitate digital content availability.

Therefore, eLearning plays a critical part in raising standards and widening participation of key players in an education system while enhancing the quality and reach of the teachers and learners. This study intends to explore eLearning and its contribution towards enhancing education delivery for sustained development in Kenya with closer look at the Nairobi City County as the case study. In the taskforce report on Education of 2014 (p.65), pinpoints technology as a key factor of production. ICTs in education play critical role in enhancing access to, and quality of education delivery, which entails effective teaching and learning.

1.2. General objectives of the study

The general objective of the study is to determine the import of eLearning paradigm in the education system and contribution towards communication in education delivery. In addition, the study aimed at interrogating the possible ways of how social change can be achieved through making the education system responsive to the dynamic and technology savvy children growing up in the 21st Century Information Age.

1.3 Specific objectives of the study

The study objectives therefore are:

1. To establish the role of eLearning in education delivery in schools.

2. To determine the availability, access and use of eLearning materials in schools in Nairobi County.

3. To explore the influence of eLearning to standard classroom-based learning and education delivery in Nairobi County.

4. To interrogate appropriate solutions to the challenges facing eLearning uptake in Nairobi County.

1.4   Research questions of the study

The study will be guided by the following research questions,

1. What is the role and influence of eLearning in education delivery in schools?

2. How is the availability, access and use of eLearning materials in schools in NCC?

3. How has eLearning influenced the standard classroom-based teacher to student learning in NCC?

4. What are the challenges facing the adoption of eLearning in schools in NCC?

1.5   Justification for the study

Moemeka (1996) postulates that development communication is the application of the process of communication to the development process using the principles and practices of exchange of ideas to development objectives. It is from this point of view that this study analyses eLearning in schools focusing on the effective adoption of ICTs in modes of education delivery. This implies a new paradigm in the standard-classroom communication process which is laden with top down persuasion tendencies and lack of feedback into transformative and participatory communication that is geared towards attainment of sustainable social change in Kenya through education.

The Kenyan education system has undergone transformation to meet specific objectives key among them to promote national development. Several Sessional papers have been written and commissions setup by successive governments to address the key educational objectives.

The education sector provides the skilled human capital necessary for development. How this transformative information and knowledge is imparted makes it important to evaluate and assess the effectiveness of an education system. Therefore there should be in place an education system that is responsive to the local and global needs of the economy as well as the 21st Century learner today. Overtime research and innovations in education globally have indicated that eLearning benefits have the potential to contribute positively towards democratisation of education in the developing countries. ELearning provides a learning environment that embraces effective and efficient ways to ensure access, equity and provision of a quality education. Which go a long way in providing an enabling environment through learning that yields to aspirations of sustainable development.

The vision 2030 envisions a globally competitive quality education as one of the drivers towards attainment of sustainable development. The government of Kenya, sessional paper number 14 of 2012, seeks to empower the government to mobilize monies that will see eLearning a reality in schools in Kenya. Exploiting the possibilities of technology in education firmly fixes the focus on the learners in this case both the teacher and the student. Thereby unlocking the potential of the masses in creating local solution to local problems that can be tested and shared globally. For instance local content production for the world. This study will contribute towards policy formulation and sustainable implementations strategy towards the realisation of an effective eLearning system in schools with a view to prepare a human capital that can compete globally in developing innovations and offering solutions to challenges that impede social change for the better. This study will also encourage and promote innovations by the young generation as it will bring to the fore the vast opportunities that eLearning can offer to established and upcoming programmers, content developers, authors, teachers and students themselves.

1.6   Significance of the study

Unlike the standard classroom-based learning materials which are static, eLearning presents an era of dynamic digital content that can be easily critiqued, corrected and updated in real-time through face-to-face and virtual interactions. It also creates an enabling environment for participatory communication in education systems. Furthermore, it presents a phenomenon in development communication characterised by sharing of personal experience. This creates a foundation for interpretation of behaviours, patterns and deducing of core values ideal for social change to occur in a society.

The study will be useful to the primary as well as secondary stakeholders in the education sector especially by informing education policy by advocating for implementable strategies that take advantage of the technology-savvy young generation and the wealth of information available for free in the global village we are in. Kenyans have contributed to world innovations such us the M-pesa.

A study by Otiende *et al,* (1992) indicates most developing countries are yet to fully utilize ICTs for learning purposes. For instance in Kenya ICTs in schools are used more for administrative purposes whereas eLearning only occupies a meager 7.14% in terms of use. Signs to increase this percentage are showing with the government's move to have ICT use entrenched in its education policy, for instance, introduce laptops for class one pupils and increase computer labs in schools. The development of local curriculum based content is being done but the challenge has been the production processes and dissemination in addition to inadequate or lack of skills in ICTs among the current teachers. The contribution of Non-profit making organisations such as the *Bill Gates foundation, Kytabu* and *Worldreader* in closing the knowledge and information gap is impressive; they have been working with local marginalized communities to make educational materials available through eLearning platforms such as mobile phones and e-readers (Kindle

readers and XO laptops among others). This contribution is highly welcomed and recognized by African governments and UNESCO.

The current Government of Kenya and the County government of Nairobi places emphasis on equity and quality education for its population as the drivers to sustainable development thus there is need for research to inform such endeavours. This study yielded important information that add value to the implementation strategies of education policies or inform policy formulation and implementation in areas of technology use in education.

1.7   Scope and limitations

The study was conducted within the boundaries of Nairobi City County (NCC) which the researcher used as the 'case'. NCC is the capital city of the Republic of Kenya. It has nine districts namely, Dagoretti, Njiru, Embakasi, Kamukunji, Kasarani, Langata, Makadara, Starehe and Westlands. The total population of the City is projected to reach 4.2 million by the year 2017 representing an 11.2% annual growth (The NCC Taskforce report on education, 2014).

The total population according to KNBS data of 2009 indicates there were 2.7 million school going age children of between the ages of 05-19 years. However it is important to note that enrolment is not 100%. In addition the 2017 projections puts the figure at 3.7 million. The department of education in the City is the oldest having been set up in 1964 and established under delegated authority as per Section 5 of Education Act. Cap 211 of 1968. There are 21 ECDE centres, 205 primary and 78 secondary schools within the county. The NCC task force on education notes that a majority of this schools are in the informal settlements. (NCC Task force report on education, 2014 pp5-14).

The researcher anticipated certain factors would affected the results of the study. Which were generally beyond the researcher's control. However, the study tried to minimize their influence so at to present credible findings. Immediate limitations were;

limited time of conducting study, limited facilities and financial resources that would have enable the researcher cover the geographical scope and the large population within the county. The researcher capitalized on purposive sampling method because of its merits while keeping the demerits in check. For instance, it was less expensive and less complicated sampling method. However, the sampling method provided no basis for estimating the sampling error. Therefore, ability to generalize the findings beyond the specific sample studied were limited (Bailey, 1994, p.96).

Furthermore, the researcher capitalized on the merits of the sampling procedure. For instance, the researcher identified skillfully the ideal respondents (key informants/experts) who suited the purpose of the study. A mix of qualitative and quantitative research methodologies was used. The researcher also reduced biases by way of having three research instruments (key informant interviews, focus group discussions and questionnaires) to increase on objectivity in the findings. The researcher bound the case by definition and context to ensure the study remains reasonable in scope.

In summary, this study underscores the import of eLearning to education delivery. In addition, the study focused on eLearning as a phenomena likely to address negative issues affecting provision of education, a basic human right of every child in Kenya. Therefore, a human capital necessary to spur national development must poses the relevant skills and competencies in order to compete globally. The study also attempts to highlight new opportunities that eLearning as a concept of mass communication, information and knowledge transfer brings to a globalized world today.

The study was carried out within the Nairobi City County and the findings are intended to contribute towards informing the implementation of policies on eLearning adoption and entrenching quality education as the foundation for sustainable national development.

CHAPTER TWO: LITERATURE REVIEW

2.0 Introduction

This chapter presents a review of the literature that touches on issues about promoting sustainable development through education as the foundation while focusing on eLearning paradigm in schools. Hancock *et al* (2006 p. 26) argues that, a review of literature helps in determining variables and important research questions or hypothesis, establishing the need for a study. Fraenkel *et al* (2012, p. 38) establishes that, there is a need for researchers to be able to not only locate other work dealing with the intended area of study but also to be able to evaluate the literary work in terms of its relevance to the research question of interest. Discussions on the theoretical frameworks to understand the phenomenon under study are also provided in this chapter.

2.1   ELearning in perspective

ELearning pedagogy is one of the new paradigm is education delivery. Its origins can be traced to the developments in the *e-revolution* themes in the computing world, associated with e-mail, e-commerce among others. Dagron (2006) emphasises that ICTs for development should not fall into the trap of 'e' for *electronic* era but redefine it to mean *effective* and *efficient* which simply connotes value addition to already existing systems such as modes of education delivery in schools.

Henke (2001, p.7) advances that; the advent of computers and the Internet technologies made experts predict numerous effects of computer use over time. For instance, the world will be a paperless society, the rise of electronic learning resources (eBooks') and the mass communication effect of the World Wide Web among many today continue to contribute in widening the digital gap, adversely effecting developing countries.

However, computing technologies today are not only altering the mechanics, mode and flow of educational inquiry but are transforming educational communication altogether. This transformation in the education realm is widely expected to impact positively on the development agenda.

Boafo (1996, p. 178) stresses the important role ICTs play for development, he argues that communication technology process and strategies are vital components in attaining development goals in African countries similar to increased literacy levels. This clearly shows the import of adopting innovations such as eLearning models that will add value to education thereby contributing towards overall development agenda.

Dron (2007, pp.7-8) and Omwenga *et al* (2004, pp. 34-46) defines eLearning as the effective use of digitally-delivered services and content to help human beings learn in a transformative way. It is considered a revolutionary way that empower learners and teachers with skills and knowledge they need in a convenient time and space–independent. In such an environment, learning ecology is viewed as one that is comprising people who use ICTs to interact with each other, who create it and the content it represents, the infrastructure that supports it and the administrational mechanisms that surround it including the community that form within it and the pedagogies employed.

In light of this, information communication technology media enables the human being component in an education system to utilize the immense power of the computing devices as important learning tools. Computing devices become an environment that constructs itself as tool but when connected to a network (Internet) it turns into a virtual wealth of knowledge, in way traditional mass media (print books) could not match.

2.2   Technology for educational purposes

Information and communication technology is identified as a critical factor in enhancing access to and quality of education. Deploying ICTs in education processes

yields improved teaching and learning outcomes therefore special keen interest by stakeholders towards development need to be supported by policy and implementable strategies among other key pillars (NCC Taskforce report on education, 2014, p.65) Therefore, an ideal education prepares one for information processing tasks such as reading; comprehension and retention which are necessary in sustaining meaningful debates on transformative socio-economic development issues.

To deploy ICTs for development, Kenya needs to develop a critical mass composed of relevantly skilled and trained personnel at all levels in human capital development. Developement of human capacity in ICTs is sustained by the promotion of relevant educational curriculum, creation of appropriate educational facilities (eLearning models) and an emphasis on development of adequate skills and competencies in ICTs use. Dagron (2006, p.988) argues that,

> "… like community radio successes in development and participation… schools are another important platform for ICTs development, not only because they exist even in most remote rural areas of our countries, but also because in terms of skills, teachers and students are more likely to adopt the new technologies. It is important, however, to ensure the interaction with the community as a whole to avoid creating a closed structure for small privileged group…"

2.2.1   Equity in education mitigates disparities in development

Equity and quality in education are important for harmonious development results in a country. ELearning has been rooted as one of the main ways of achieving effective learning. Elearning presents possible ways of overcoming some of the key challenges in delivery and access in education. For instance, technology in education overcomes traditional barriers to learning such as, time constraints, entrance requirements, geographical distances, socio-economic, cultural and gender issues (Omwenga *et al.,* 2004, p.35).

Moemeka (1996) defines development as the acquisition of new knowledge and skills as a matter of growth for a new consciousness to uplift the human spirit and growth of the human mind. Education sector has been singled out as the critical contributor to national development. United Nations Sustainable Development Goal (UN-SDG)[2] number four underscores quality education as the foundation of development globally. This is because, it contributes to the knowledge economy by providing quality and skilled human capital necessary for development of a countries economy as well as personal growth which is in agreement with Otiende *et al* (1992, pp.152). Nonetheless, many questions remain, why is development elusive in LDCs despite the useful technological innovations permeating from the north? However answer to this question is beyond the scope of this study.

Freire (1970, p. 72 & Brown 1985, p. 278) argues that education and literacy play a key role in human development by making human beings understand the world, enabling them to participate in transforming it positively and in developing a critical thinking and attitude that yields social change. Therefore, the ideal education is the one that embraces dialogical process that engages students and teachers to participate in learning, content development and real-time feedback that is useful in the education process. Even so, a digital learning environment in the 21st Century requires a learner to have certain competencies in order to able to consume, collaborate and in the process create *new* content. The outcome of such an education is to make a difference in the quality of life in the communities they are in.

Through collaboration, eLearning offers both the teachers and the learners the capability to extend knowledge while they contribute more actively and effectively in developing innovative educational solutions in pedagogy. Traditionally, the mode of education delivery, communication has been through instruction in the classroom using

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[2] SDG goal No. 4: Ensure inclusive and quality education for all and promote lifelong learning. See: http://www.un.org/sustainabledevelopment/education [Availble online] Accessed, September 24, 2015.

print media and in some instances use Radio class programmes which make the students passive receivers of information. With the incoming of computers in the 1990s, information explosion phenomenon came into being. This made most educationist to focus on to the emerging technologies to improve the delivery of instruction and to help them overcome numerous challenges of accessibility and availability of quality learning materials among others. However, the thinking that eLearning is about technologies and not learning per se continue to confuse the stakeholders today. This therefore, calls for more studies that aim to clear the air in the understanding of what exactly eLearning is, so as to have its smooth implementation. Elearning implementation is all schools helps reduce the digital literacy gap created by the widening digital divide and the constant flow of technology and knowledge from the *north*.

According to Chapman *et al* (2004) and Oloo (2009), focus in those early days in developing countries concentrated on delivery of direct instructions and administration purposes. Chapman further argues that the newer technologies such as the Internet and mobile phones, expand communication process making it more horizontal with a vertical mix to increase access to educational resources thus changing the teachers' role in the instructional process unexpectedly causing a shift in pedagogy as envisioned by Freire (1970),

> "…the libertarian education, an education that reconciles the poles of the contradiction which showed the teacher on one side of the pole and the student on the opposite side to education that simultaneously transforms both the teacher and the student. The role of the teacher becomes more of a coordinator/facilitator..."

Aphek (2005, p.179) points out the power inherent in the today generation child whom she refers to as the *net-gen* as important pushers of innovations. This is the group that needs to be targeted. The tech savvy young generation in the 21st Century are in need

of a learning environment that enables them to acquire relevant competencies that make them be an ideal human capital necessary for sustainable development.

2.2.2   Benefits of eLearning in an Education system

Waithera (2005, p.42) reinforces the importance of ICTs in education, arguing that they bring the promise and benefits of inclusion, opportunity and wealth to some quotas. However when not checked, ICT use easily creates a greater chance for isolation and increased poverty brought about by affordability and availability of such technologies. Thus it is imperative for stakeholders to make is easier to access and afford ICT technology equally across social classes.

Affordable access to ICT and its related infrastructure must be addressed to cub digital divide, which is widened day by day due to the rapid technological innovations happening globally. This will make it easier for effective use of the gained and retained knowledge which is a key factor for economic sustainability and improved social conditions. For instance, fully supported technology *hubs* for mobile/computer *Apps* and digital content development will lead to availability of the tech-savvy young generation that has the relevant skills and competencies. This generation of human capital will be ready to create relevant technology based solutions to improve service delivery in the social-economic sectors such as health, education, agriculture and finance, hence spurring national development. Practical examples such as M-pesa, M-learning, M-farmer among others continue to impact many benefiaries in Kenya.

Tonga (2005, p.144) points out that ICT usage does not occur in a vacuum but rather in a social cultural environment that shape the digital divide. ICTs in education therefore must be seen to provide value and be sustainable for the user and the service provider perspectives. However, the desired end goals of empowerment and opportunities make access to ICTs a critical factor to production. Properly structured eLearning

environment must aim at sustainability and provide value for investments. Aphek (2005, p. 179) recognizes the import of eLearning in schools providing ideal scenarios that the developing countries can emulate. However she argues that many a times educational systems have been in investing much time and resources in teaching teachers' computer and Internet skills often without spectacular results.

In addition, other factors such as limited financial resources and maintenance has slowed down the uptake of proper use of technology in the education sector. This continues to be a great challenge even today as other factors such as inadequate policies and implementation procedure get hijacked by people with contrary personal interests. Resulting into failure of such projects, for instance, laptop for schools project initiated by Kenya government has failed to take off since its inception in the year 2013.

Proper adoption of eLearning in primary and secondary schools in Kenya will make education sector live up to its mandate of channelling out a relevantly informed population (the necessary human capital) ready to take up the challenges brought about by globalisation. Therefore, a digital learning environment is anchored to an adequate development focused curriculum that promotes lifelong learning. This will be the most basic and appropriate level to address the digital divide and knowledge gap that bedevil most developing countries. Nonetheless, Kenya stands out among the developing countries (LDCs) with successful innovative products in ICTs that continue to make a mark in the global arena (Gathigi, 2012). These ICT products have brought solutions that address issues and challenges in the Agricultural, Health, Financial, and Education among other development oriented sectors.

2.2.3   Appropriate eLearning implemenation for development

Little impacts have been reported on utilization of ICTs for pedagogy in the education sector. This therefore calls for appropriate measures to be put in place by the

government and all stakeholders in the education sector in support of eLearning. Waithera (2005, pp. 43-45) points outs that learning objectives should be aligned with the learning technologies in order to realise the pedagogical rationale for ICT use in schools. Properly implemented eLearning advocates for improvement on delivery of education and as an aid in the teaching and learning process. Waithera (2005) also adds that, firstly, ICTs uses should demystify the importance of computers at school level which over time have been equated to toys. Secondly, eLearning is expected to prepare learners for current employment skills requirements by way proving possession of relevant computer competencies.

Even so, educational choices have to be made first in terms of objectives, methodologies and roles of teachers and students before decisions on appropriate technologies to be used. Besides, some of non-negotiable conditions for ICTs adoption such as, community ownership, use of local content, choosing the appropriate technology; among others are must-have conditions that will ensure sustainability of development projects in countries (Waithera, 2005, Tongia, 2005 & Dagron, 2006).

Waithera further argues that the capabilities of ICTs to achieve development goals will not be effectively leveraged without digital content that is responsive to the user needs and local learners' environment. As a country, stakeholders in education sector need to advocate for a strategy to encourage increased local content production for local consumption and for export. This will also facilitate an increase in the appropriate usage of the ever changing digital technology by the learners.

Effective eLearning environment however, can only succeed where there is use of language of the beneficiary, that is, locally tailored content in order to achieve educational objectives that support development goals within Kenya. However, Moemeka (1996, p.19) adds that, for sustainable development to occur, the mass media (ICTs) strategies that utilise traditional media and modes in collecting materials to be included in their modern

media programmes and in disseminating further, interpreting and consolidating mass media messages could prove effective in rural/urban development. This means therefore, use of local digital content for eLearning pedagogy is critical for a transformative education. The ultimate goal for ICTs should be to catalyze development activities and this can only happen if individuals have knowledge power.

Smith (1998, p.197) argues that, eLearning appears to elicit very strong responses either for or against, neither approach is likely to be constructive in addressing innovative solutions to educational objectives. Concern should be on effective and efficient learning, that is, information and knowledge delivery and not the technology in delivery materials. Relevant knowledge and information therefore, are important because a democratic nation depend on well informed citizens who are all rounded and can contribute actively to national development. Moreover, Ndemo (2015) concludes that a country should aim at making the education system more dynamic and responsive to tech savvy young generation growing up in an information rich environment.

2.3   The potential of ICTs for transformative education

Kangethe (2013) points that during the launch of a local digital content development platform by *intel* company, the Education Ministry Cabinet Secretary, Prof. Kaimenyi reaffirmed the government commitment into the use of ICTs in schools to transform education. *"Indeed, towards the realisation of Vision 2030, the education system will be guided by placing emphasis on the new developments and subsequent innovation in science and technology."* The techniques used in teaching on an eLearning platform shifts more responsibility to the students without locking out the teacher who even becomes more important as coordinator or facilitator in the learning process. However, learners in a digital learning environment can become better in seeking out relevant information and interacting with people in other location. This makes them active participant in pedagogy

through the reinforcement of student centred learning. In addition, the dynamic nature of content makes it easier for review, update or error corrections faster as opposed to print learning materials.

The online delivery of information, communication, education and training provides a new set of tools such as motivation by way of making learning fun, interactivity, flexibility among others that add value to all the traditional learning modes, i.e. the classroom experience, textbook study, CD/DVD-ROM and traditional computer based training defines eLearning. There lies the enhancement of learning in the standard-classroom setting by taking advantage of new dynamic content and delivery that bring in effective and efficient ways to learning that add value to education (Akinsanmi 2005). eLearning therefore, offers the learner the opportunity to control and direct their learning and continually extend, renew and update their knowledge and skills by providing the possibilities of easy access to development in all fields of knowledge through open lifelong learning.

Worldreader[3] through its mobile phone and kindle platforms recognises the importance of education for development. In its efforts towards supporting eLearning, it has digitised and distributed 944,300 books in Africa. These local books are uploaded onto appropriate platforms, majorly Mobile phones and Kindle e-readers. Such successful projects support eLearning and pedagogy catalyzing the sustainable development required in the third world countries. During a recent work shop for publishers and educational program managers organised by *Worldreader*, its was apparent that if not carefully addressed, ICTs will widen the digital divide among the urban verses the rural communities thus policy and planning should be explicit on the adoption and use of ICTs in schools in the developing countries on equal measure.

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[3] See more: www.worldreader.org

2.3.1   Inadequate use of ICTs in education

Oloo (2009) paints a grim picture of how ICTs are utilized in Kenyan schools as cited in a survey conducted between the months of June and November in 2008. It was reported in the survey that ICTs motivates students to learn, whilst the report indicates that, the use of ICTs in schools was largely for schools administration tasks at 71.43%, teaching basic computer skills at 67.85%, examination processing at 51.79%, Teaching KNEC syllabus at 39.29%, Internet services at 23.21% whereas eLearning received the lowest percentage in order of priority at 7.14%. Another interesting finding was that in the 56 schools sampled, the ratio of gadgets to student stood at one computer to 22 students which is still below the norm in most developed countries which stands at one computer to 15 students (MoEST, 2006). However, previous government had put the computer to child ration at one to 150 in the year 2005 with the ratio widening in disadvantaged areas. This however, was expected to be different through the implementation of *digischools* programme by the current government through the multi-agency approach to implementation of eLearning in schools.

A closer look at educational sub sectors, the picture is grimmer, in primary schools level it stands at one computer per 250 students whereas the ratio in secondary level stands at one computer per 120 students. This shows the real challenges impeding adoption of ICTs still remain to be the access to the digital content, acquisition and maintenance of the computers/devices in addition to the overreliance to Donors (NGOs), Parents Teachers Associations and the government.

The government places more emphasis on availing eLearning devices (mostly funds for Desktop computers and computer labs) to educational sub-sectors above the primary level more. Besides, the current government targets to avail laptops to class one every year is a step towards the right direction taking a content driven approach which does not limit the choice of eLearning device to use in schools. Nonetheless it should be

properly implemented having the educational objectives in mind, as it will play a big role in helping lay proper foundations for quality education through proper ICTs use in Kenya. Hence leading towards attainment of sustainable development envisioned in the global SDGs. It should be noted that ICT infrastructure in a country is a critical to eLearning success determinant in terms of content quality and reach.

2.3.2   Inadequacy of digital course content inhibits eLearning

Availability of relevant digital content (supplementary, reference or course content) facilitates learning in a digital learning environment. Local publishers through the Ministry of Education and the Kenyan Institute of Curriculum development have been developing content for eLearning purposes for schools, both for primary and secondary. Digital content for classes one to two have been vetted in readiness for public schools' standard one laptops roll out plan by the current government. However, the quality of this content has not be put to test. In addition, there has been unresolved pertinent issues ranging from procurement to sustainability of the projects among others that are preventing the much hyped roll out plan.

It is worth noting as Mwazemba (2015) opines that it is only the form of the book, which is changing and it is giving the reader more access choices. *"...publishers should position themselves to meet the needs of those who want digital books..."* Therefore, local publishers have no choice other than being at the forefront in facilitating eLearning by way of availing relevant content. Publishers/content developers have been tasked to provide digital content in a format fit for end users. their gate keeping role is important in ensuring quality and sustainability in content provision for eLearning purposes.

Interestingly KICD has content for up to class eight although it is majorly instructional in nature and it's an improved version of print textbook, thus limited in terms of interactivity, flexibility, motivation, collaboration among other capabilities that make

information therein interesting and resourceful. Furthermore, it does not offer variety like in the print textbooks currently in the market making where end users choose among six approved titles per subject. Therefore users will be locked to one content provider, limiting learning process.

Questions have been raised over KICD legal mandate, makes it's a regulator and therefore it cannot be a player in the educational publishing industry. However, the KICD Act No 4 of 2013, [4] gives it powers to be a publisher of last resort. Ndemo (2015) argues that KICD acting as a gate keeper and a player in content development stifles innovations in digital content development. Therefore in its practicality, the regulator should be at the fore front in encouraging innovation in the education sector and not competing with publishers.

This kind of gate keeping coupled by unwilling publishers (who majorly invest where there is real cash flow) in a set-up of global open learning will disenfranchise the young generation. There is a dire need to move away from such closed learning systems. Mwazemba (2015), argues that publishers in Africa as professional content providers need to position themselves to meet the needs of those who want digital book as well as those sticking to print books. A blended eLearning environment benefits from such arguments in meeting the learning objective in development.

Most local private schools such as *Makini* and *Rose of Sharon* among other academies in Nairobi have fully developed reference based digital learning materials for their students adopting foreign but customised LMS. However, this represents a small percentage that only caters for their clientele. The driving factor being the fact that elite schools try to balance commercial interest and development interests with the former being over-emphasised. *Worldreader* a non-profit making education enabler, recently emerged as force to reckon with in provision of learning materials in digital formats (e-readers and

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[4] See more: http://www.kicd.ac.ke/

mobile phones) to marginalised communities in developing countries like Kenya. Through its partnerships with the government, it has benefited many disadvantaged learners, improving access to education in those marginalised areas. However, Worldreader efforts only address a part of the eLearning pedagogy, which is encouraging consumption of text and imagery through provision of content in digital format. Hardly does it cater for the collaboration and creation of new content as critical competencies learners in the 21st Century require.

2.4   Recent studies on effects of ICTs use by children

The increased use of computing devices by children between ages of two to sixteen in the developed world continue to yield important research findings which are worth noting as we embrace eLearning. For instance, the American Academy of Pediatrics (APP) posted research findings conducted on children. It came up with recommendations on screen time for children, for example eliminating screen time completely for children below two years of age because the argument being that, current devices such as Smartphone and tablets do not contribute to the development of a child's psychomotor skills which are better enhanced through real-life experiences (APP, 2015).

At this level devices are counterproductive as they do not promote active exploration necessary for the child's growth. In another research, doctors confirmed that screen time[5] affects teens sleep. The study conducted in western Norway, on active teens who use Computer's and Smartphone's on a daily basis indicated that the longer the spend time using the gadget especially sleeping time the more their brains get affected negatively, for example lack of proper sleep which may adversely affect normal learning. The kind of media content consumed, too, may play a role by causing increased psychological arousal

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[5] This is the time someone spends while interacting with a computing device/gadget.

during rest time thus overworking the brain at night when it should be resting (Daily Nation, 2015).

These studies recommends a restriction in media usage in general by the young generation. ELearning tools such as tablets and mobile phones have been identified to impact negatively on sleep and mental well-being of the young generation. A healthy media usage strategy is necessary today so as to provide specific guidelines regarding the quantity and timing of electronic media use in general to safeguard the health of the human capital created for transformative development.

Recently the president in his speech at *Precious Blood-Riruta* during the marking of world Internet day called on the stakeholders especially parents and teachers to equip themselves with current ICT skills to be effective facilitators in this new open learning system. *"…it is our collective moral, social and legal responsibility to ensure that the Internet is a safe place for our children…"* He further advised the service providers (publishers/digital content providers) to build child safety capabilities into platforms and products to protect the children who are vulnerable information consumers in the globalised world today Macharia (2015).

In summary, it can be of great benefit to put the mastery of children who can easily adopt ICTs usage to become early adopter necessary for innovation diffusion to the benefit of society in various ways and by means of different projects. These youngsters have been described as tolerant, curious assertive and more self-assured emotionally and intellectually open. Their mastery of using ICTs (computers and mobile phones) after exposure at an early age are often better than adults, mastering many qualities and attributes commonly seen as preserve of the adults, thus presenting a shift in the role and status of children in the society (Aphek, 2005).

MoEST (2006) points out that the Kenya Government will use ICTs in education and training to improve access, learning and administration, with the overall objective of

planning to ensure that systematic efforts are made towards strengthening adoption and use of ICTs in the education sector as envisioned in the Vision 2030, Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC, 2003-2007), Sessional paper No 1 of 2005 and the United Nations Millennium Development Goals (MDGs) and SDGs. The current trend in information and knowledge access are offering a combination of benefits that truly improve cost-effectiveness and make ICTs support and enhance learning supplementing the traditional classroom even in developing countries.

Dron (2007, p.313) argues four possible future outcomes of eLearning, where two of them are critical for sustainable development. Firstly, technology can frustrate because of its dynamic nature thus defeating the sustainability aspect necessary for development projects. Secondly, technology empowers, it is this that the education sector should concentrate on more because learners acquire the capabilities to control their own learning by whatever means appropriate. This power is distributed and flexibility becomes a crucial factor in enabling lifelong learning. Therefore in harnessing ICTs for educational programmes, content should be relevant to the curriculum requirements of the education system and the needs of the students, teachers and administrators.

Use of ICTs in schools in particular should not simply automate traditional teaching methods or solely for administrative purposes, but they should be a platform for promotion of innovations and creativity in which the teacher and the student both become learners who participate in problem solving activities. A shift in teachers' roles requires them to get critical guidelines and upgrading of their skills and competencies for proper use of ICTs. The case of Israel presented by Aphek (2005) reveals the importance of tapping the innovative and creative skills of young minds for the benefit of the society as whole. The contribution of *Worldreader* and other NGOs in facilitating access to information and technology in marginalised areas needs to be emulated by way of having readymade digital

content for appropriate technology to enhance adoption of innovations in education across the communities.

A sustained adoption and utilization of ICTs requires a coordinated participatory-partnership between all the stakeholders in the education sector and ICT sectors while cutting across the private and public sector. In order for developed countries to achieve the national development aims, there is need for a critical evaluation of equality of the distribution of social and economic benefits in information and education among other measures (Moemeka, 1996). The government must sustain commitment to ICT infrastructural development as well as local digital content provision. In addition to, reaffirmation the government commitment into the use of ICTs in schools to transform education as provided for in Vision 2030 social pillars.

2.5   Theoretical framework

To understand the phenomena understudy in this research project, the study was anchored on the following theories: Expentancy Value theory by Martin Fishbein, Cognitive theory of Multimedia Learning by Richard Mayer, and Globalization theory of 'The Network Society' by Manuel Castells.

Fishbein (Littlejohn *et al* pp.76-77) posits two kinds of beliefs; 'belief in' a thing and 'belief about' a mix of the two will form a positive or negative attitude towards an undertaking. For instance, in this study the researcher interrogates the potential for sustainable development through use of communication media. In this case appropriately implemented eLearning in education. The researcher has a belief that the use of eLearning could be the way to achieve sustainable development. ELearning outcomes should make a difference in the quality of life in communities. Such correlation of attitude with belief leads to certain behaviour towards attitude object, hence influence social change.

Positive attitude towards eLearning would consist of other attitudes', for example, the ideal education system to support sustainable development, legislations and policy decisions, lowering cost of production and support local innovations for educational purposes. This theory was further developed by Philip Palmgreen (1984) who argues that, the gratification users seek from media are determined by our attitudes towards the media, that is the beliefs about what a particular medium can give you as well as the evaluations of material (Littlejohn *et al* 2008, p.301).

Expectancy-value theories hold that people are goal oriented beings such that the behaviour they perform in response to their beliefs and values are undertaken to achieve some end. This theory has proved useful in the explanation of social behaviour, achievement motivation and work motivation. It is argued that the combination of beliefs and evaluations developed on a program, content or a specific media could either be positive or negative. If positive the likelihood of continue use of the media choice, if negative, one avoids it. ELearning entails use of various modern communication media to access or disseminate knowledge and information. Learners therefore in a digital learning environment hold attitudes that influence manufactures device ways satisfying end users. Below is a conceptual model designed by Palmgreen (1984).

Figure 1.1 Expectancy-value model
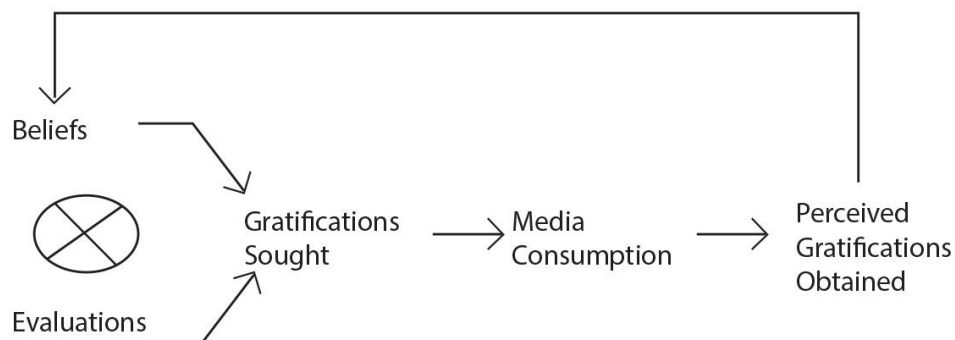
Source: Palmgreen (1984)

From the above model, perceived gratifications can be enhanced through learning in a digital environment where eLearning takes place. This is made possible through eLearning pillars of motivation, connectivity, collaboration, interactivity, flexibility and extended opportunities.[6]

Richard Mayer (2005), Cognitive Theory of Multimedia Learning (CTML), postulates that, people learn deeply from word and pictures than from word alone. Sorden (2012) argues that as a cognitive theory of learning, this theory falls under the larger framework of cognitive science and the information-processing model of cognition. The theory explains how the human mind works in learning environments. It states that people can only process a limited amount of information in a channel at a time, and make sense of incoming information by actively creating mental representations.

The human memory stores, that is, *sensory*, *working* and *long-term* play a critical part in the learning process. This theory posits three main assumptions, firstly, there are two separate channels (auditory and visual) for processing information, secondly, each channel has limited capacity and thirdly, learning is an active process of *filtering*, *selecting*, *organising*, and *integrating* information based upon prior knowledge.

Mitchell (2015) highlights that this theory tries to address how to most effectively and efficiently enhance the learning of students with low prior knowledge taking advantage of the understanding of how the human brain works. It seeks to eliminate extraneous load and provide students with helpful schemas. Mayer (2005) posits that meaningful learning occurs when the learners appropriately engage in all of the processes depicted in figure 1.2 below.

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[6] Effective Practice with eLearning-A good practice guide in designing for eLearning. p.7
www.jisc.ac.uk/elearning_pedagigy.html

Figure 1.2 Cognitive Theory of Multimedia Learning (CTML) model
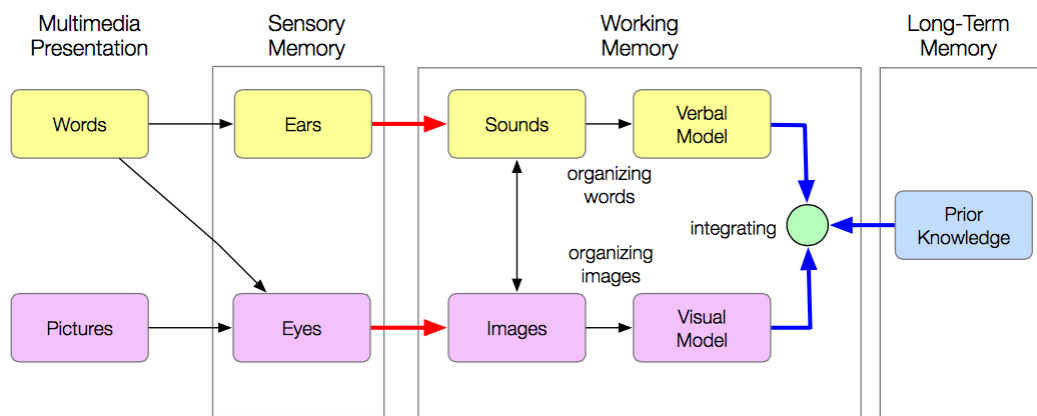
Notes: (1) arrows represent cognitive processing, (2) red arrows represent the specific process of "selecting" information to be used in working memory, (3) blue arrrows represent the specific processes of "integrating" information.

Source: Mitchell (2015)

Mayer's cognitive theory postulates that the brain does not interpret a multimedia presentation of words, pictures and auditory information in a mutually exclusive way, but the above elements are selected and organised dynamically to produce logical mental constructs. He also underscores the usefulness of learning when new information is integrated with prior knowledge (www.learning-theories .com). In light of this, the 21st Century learner is in need of relevant competencies to fully utilize the robust and dynamic technologies available today. This theory is in agreement with the mode of consumption, interpretation and usage of digital content displayed by learners. Therefore, focus in a digital learning environment shifts from consumption only to include collaboration to extend knowledge and creation of *new* content (i.e. innovations).

The third theory used in this study is globalization theory. Globalization debate world over seeks to find the appropriate definition of the processes that shape today's social world and human cultures (Robinson, 2008, p.126). Certain schools of thoughts have associated globalization and the processes that carries with it a host of negative facets such as, it's exploitative, domineering, displacement, marginalisation among similar concepts. However, there are those that view globalisation as processes that create new found prosperity, freedom, emancipation and democracy.

Castells, through his three fold studies titled *'the rise of the network society'* (1996-1998), posits a *'technologistic'* approach to globalisation. He argues that the rise of a new economy is: (a) informational, knowledge-based; (b) global, in that production is organised on a global scale; and (c) networked, that is, productivity is generated through global networks of interaction. Thereby leading to information capitalism (Robinson, 2008, pp. 132-133). This theory borrows constructs from the development theories of 'world systems' and 'global capitalism' which explains capitalist systems and its dynamics.

This theory slightly deviates from the above two, as it focuses on technological change that is contributing to variety of processes referred to as globalisation. It shows the notion of globalisation as representing age of information resulting from the rapid development of ICT and the consequent raise of a networked society, leading to a new mode of development. He observes that, human society/communication is rapidly transforming from pre-literate verbal order through to alphabetic order to the current increasingly dynamic audio visual systems of symbol and perceptions. Globalised age therefore is characterised by an integration of various modes of communication into an interactive network involving text, sound and images (Robison, 2008, p.133). ELearning paradigm presented in this study is a phenomena that lends itself to global tendencies, hence the adoption of UN-SDGs targets such as those on education by member states.

Robinson (2008) further argues that Castells' theorises the new economy as one that came about in two analytically separate processes coming together. That is, the development of information technology (IT), particularly the computers and the internet and capitalist retooling using the power of this technology and ushering in a new system of information capitalism. A key institution of this new economy is the *'networked enterprise'* seen as the precursor of a more general form of social organisation, ideally the network society itself. In this theory of development, eLearning in education system offers that platform through collaboration where countries knowledge can be shared via the

robust network technologies today. This therefore means, a country does not exist in isolation but can readily bench mark with other economies in terms of innovations and technological developments while avoiding the negative facets of globalizations highlighted by Robinson (2008 p.126).

CHAPTER THREE: RESEARCH METHODOLOGY

3.0   Introduction

This study looked at development communication in education focusing on eLearning in selected primary and secondary schools and its influence on the standard classroom-based mode of education delivery. This chapter presents the research methodology, design, population of the study, sample design, data collection and data analysis procedures used.

3.1   Research methods and design

This study employed a mix of qualitative and quantitative research designs. The study sought to establish relationships in the variables under study, that is, the relationship between development communication in education and the focus on eLearning paradigm. In addition, the study aimed at exploring the influence of eLearning paradigm on education delivery. The study used a mixture of qualitative and quantitative research techniques/methods that comprised collection of data using key informant interviews, focus groups and questionnaires.

Hancock *et al*, (2006, p.33) and Kothari (2004, pp.35-36) posits that the primary purpose of exploratory studies is to determine how events occur and which ones may influence particular outcomes that may lead to discovery of new ideas or insights. Methodologies in this study helped the researcher formulate a research problem for more precise investigation in order to achieve systematic verifiable truths about the phenomena. A study on eLearning paradigm in selected primary and secondary schools in Nairobi County helped present the problem under study logically.

3.2   Target population

The study was conducted in the months of April to September 2015 in Nairobi City County targeting key stakeholders in the education sector within the county. This included

the Nairobi City County Education Department, Officers in charge of ICTs in education at the Ministry of Education Science and Technology, Ministries of Information and Communication, Kenya Institute of Curriculum Development, Content providers/Publishers, NGOs, Teachers, Parents and Students/Pupils.

The researcher employed a mixture of questionnaires, interviews and focus groups to collect data from 165 respondents. The sample was broken down as follows: 75 respondents composing parents/guardians and teachers was drawn to administer questionnaires. In addition, 15 interviews for key informants in the education sector and 15 focus group discussions with pupils/students (i.e. *5 respondents each from a sample of 15 schools*) were scheduled.

3.3 Sampling strategies and procedures

The researcher used non-probability and probability sampling procedures, thus, the study adopted purposive and simple random sampling methods. To obtain the desired sample size, the county was divided into 9 districts, namely Dagoretti, Njiru, Embakasi, Kamukunji, Kasarani, Lang'ata, Makadara, Starehe and Westlands, using purposive sampling strategy, the study selected three districts, **Kamukunji**, **Langata** and **Makadara** representing 33%, which was adequate for this kind of study, Mugenda and Mugenda (2003) argue that a sample population of between 10-30% is adequate for a research study. The sampled districts presented a mix of upper, middle and lower class schools as per the data from NCC's Taskforce on education 2014, thus it will help the researcher gather balanced data.

The respondents were broken down as follows: 65 respondents comprising teachers and parents/guardians from the three sampled districts were used to collect quantitative data. This was distributed as follows: 20 primary school teachers, 15 secondary school teachers and 30 parents/guardians who were purposively selected through the respondents

in the focus group discussions and through the help of sampled teachers (distributed as per the *table 3.1 below*).

Table 3.1 Distribution of questionnaires

Sampled District	Pry. Sch. teachers	Sec. Sch. teachers	Parents/guardian	Questionnaires administered	Questionnaires returned
Langata	8	5	11	26	24
Kamukunji	6	5	9	24	20
Makadara	6	5	10	25	21
Total	**20**	**15**	**30**	**75**	**65**

To collect qualitative findings, 10 key informants' interviews with professionals and individuals with experience in the education sector and ICTs were conducted. In addition, the researcher conducted 12 focus group discussions in the three sampled district, which consisted 5 respondents per group (see the *table 3.2 below*).

Table 3.2 Distribution of respondents in focus group discussions

Sampled District	3 Pry. Schools x 5 pupils)	2 Sec. Schools x 5 students)	Number of respondents targeted	Number of respondents for successful FGDs
Langata	15	10	25	15
Kamukunji	15	10	25	25
Makadara	15	10	25	20
Total	**45**	**30**	**75**	**60**

Using random sampling the researcher selected 9 primary schools (three per districts) and 6 (two per district) secondary schools from the list of schools within the county. The researcher purposively selected upper class pupils (class 7) for primary schools and students in form 3 for secondary schools (See highlighted schools in attached *Appendix VI and V*). The researcher managed to collect both qualitative and quantitative data from 135 respondents out of the targeted 165 representing 82%, which was ideal for this study.

Merriam (1998, p. 61) and Bailey (1994, p. 96) outline the merits of purposive sampling which make it ideal method for this kind of study. Taking into account the limitations pointed by the researcher, it is much less complicated and less expensive. In

addition, the study investigated a variable (eLearning/ICTs) that is highly dynamic, this sampling procedure gave the researcher the ability to conduct sampling at the spur-of-the moment basis taking advantage of available respondents while avoiding the statistical complexity of a probability sample. Moreover, Bailey (1994, p. 96-97) posits that it is important when deciding upon the sample size to estimate how many times the sample may have to be subdivided during data analysis and to ensure an adequate sample size for each subdivision according to the variables under study.

3.4 Data collection procedures

The researcher booked appointments with key informants/experts, heads of the sampled schools and the County Director of Education; Nairobi County to discuss the research visits and to facilitate data collection process in schools.

Data collection for the study was primarily fieldwork and was supplemented by secondary data collection methods. The chief data collection methods were open-ended interviews with key informants/experts, focus group discussions and relevant documents in the following categories; Internet, Private and Public records, physical evidence and instruments such as semi structured questionnaires created by the researcher. Information gleaned from the above mentioned documents helped the researcher gather data from multiple resources to address the research questions.

Interviews and focus group discussions were used since they are the best technique when conducting intensive case studies of selected individuals. The interviews were recorded with permission and then transcribed in order to categorize the information into a coding scheme ideal for this kind of study. Prior permission was sort from the schools management to facilitate smooth data gathering using focus group discussion and questionnaires. To get the desired respondents for focus group discussions, the researcher used the class registers and applied simple random sampling to get 5 respondents from each of the sampled school.

To avoid doubt over the robustness of the data collected, the researcher did a pilot study to pre-test the instruments using few respondents in Starehe and Embakasi districts, which were not in the sampled districts. The instruments were reviewed thereafter. This was aimed at rigorously testing the validity, reliability and acceptability of the research instruments i.e. interview schedule and questionnaire that were to be used for data gathering to ensure that collected data is meaningful (Williams, 2003, pp. 245-252).

The researcher formulated appropriate categorization of collected data and developing of a coding system to convert collected data into meaningful categories to facilitate data analysis. Instances where interesting responses from open ended questions were documented and quoted as verbatim. The researcher also conducted data cleaning mostly on the questionnaire responses to identify inconsistencies and outliers by producing frequency figures for each question and examining outliers. Simple cross-tabulation was used to identify illogical/nonsensical responses.

3.5   Data analysis techniques and presentation

The nature of data derived from the multiple sources was qualitative and quantitative. Therefore, for qualitative data the analysis was a recursive process where the researcher interacted with the information throughout the investigative process while documenting findings. This helped the researcher keep biases in check by way of focusing on the research questions in light of the data obtained while collecting and interpreting only those data that are potentially meaningful to the research efforts.

The researcher developed a method for labeling, storing and access to qualitative information acquired during the research efforts. For instance, information gathered was labeled with date, location person involved and circumstances surrounding the collection of particular information.

Quantitative data collected from the instruments created by the researcher such as open ended questionnaires were analyzed using statistical software to generate

comprehensive findings. The study employed data analysis by variables in the objectives stated for the study.

The study utilized a sequential format of data analyses; firstly, the researcher used descriptive analyses where the researcher described the distribution and range of responses to each variable while examining the data *skewness*. Secondly, data was re-coded into categories where appropriate to facilitate a meaningful comparison of subgroups for instance age into age ranges. Thirdly, a bivariate analysis was used by way of using simple cross tabulations to point out trends while examining the possible associations between one variable and another. Finally, the researcher employed multivariate analyses, a regression analysis technique used to test the effect of one variable on an outcome while controlling another. The above sequence helped in minimizing biases in responses in a qualitative study.

William (2003) advices that it is critical to refer back to the original aims of the study and assumptions to be tested in order to keep the study focused. This study yielded narratives and verbatim, graphs, pies charts and tables, which comprehensively presented data in a simpler way to describe variables in the phenomena under study.

3.6   Ethical Considerations and Permissions Required

The research was conducted in Kenya and its findings were intended to contribute to the studies of technology use in education and human behaviour. The researcher requested for permission from the University of Nairobi, School of journalism, to facilitate data collection process from key experts, parents/guardians and respondents within the selected sample of primary and secondary schools (*see Appendix VI and VII*).

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.0   Introduction

This chapter presents the findings of the study. The presentations were done based on the research questions and analysis of relationships between variables in the objectives of the study. The researcher successfully managed to get responses from 135 respondents. From a sample of 75 questionnaire respondents, 65 responses were completed satisfactorily, 10 interviews out of scheduled 15 were granted and 12 focus group discussions with 5 respondents per group (*60 respondents*) out of 15 were successful.

Therefore, the findings presented in this study were based on the responses from key stakeholders and experts in the education sector. Their opinion on eLearning in schools and its influence on education delivery were captured in the questionnaires administered, key informants'/experts interviews and pupils/students focus groups discussion conducted. Figure 4.0 shows the representation in the sample used for questionnaire respondents.

Figure 4.0 Questionnaire Respondents distribution
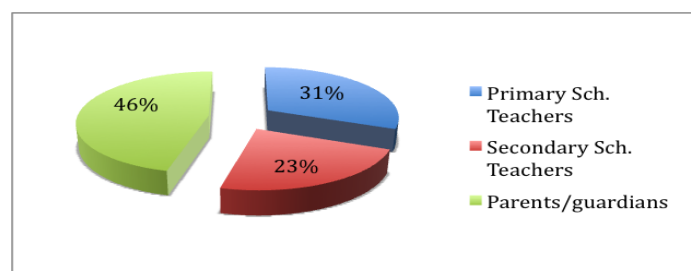
4.1   Demographic Information

4.1.1   Gender distribution

This section presents the demographic data of the respondents comprising the primary school teachers, secondary school teachers and parents/guardians. Figure 4.1.0 below presents the gender distribution in the questionnaire respondents.

Figure 4.1.0 Distribution of respondents by gender.
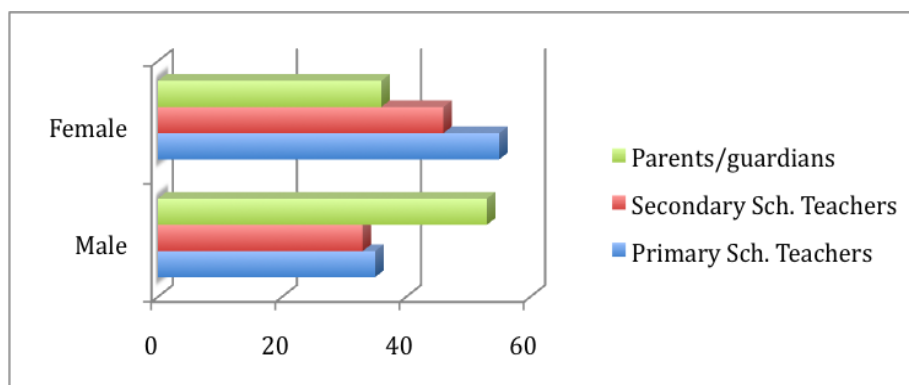
Though the study aimed at a 50:50 ratio on gender balance, more female were sampled than male among the sampled teachers in both primary and secondary schools. However, gender composition of parents' respondents reveals more males than females. However the study was able to get a 50:50 gender ratio in focus group discussions and interviews.

4.1.2   Age bracket

The researcher was interested in establishing the age distribution of the respondents. Data indicated the group aged 40-45 years was 30.7% of the sampled population, 35-39 years at 21.5%, 30-34 years at 15.4%, 25-29 years at 18.5%, 18-24 years at 5% and those above 55 was at 2%. Data implies that more respondents were aged between 40-45 years indicating they may have had an experience with standard-class room education delivery and experienced the advent of eLearning.

4.1.3   Education level

In terms of highest education attained, the sampled population was compared as follows: The highest category in the sample were those with university level at 46.2% closely followed by tertiary level by 35.3%. 7.6% had O-level education, 6.2% had primary education and 4.6% had A-level education. This is presented in figure 4.1.1 below.

Figure 4.1.1 Distribution of respondents by highest academic qualifications
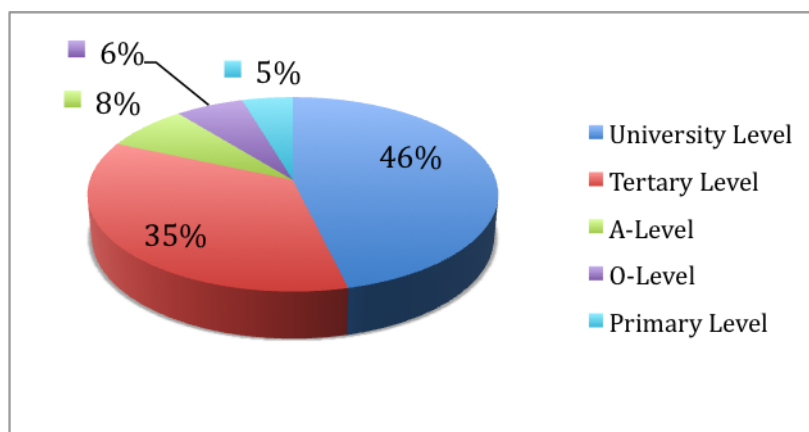
The data analysed indictes that the respodents had achieved various qualifications which may influence their decisions or opinion regarding education delivery as well as eLearning use in schools. This is indicative the literacy level of respondents could have a signficant effect on choices and decisions regarding eLearning adoption.

4.2   Analysis on the role of eLearning in education

This section of analysis presents data on the role of eLearning in schools and its influence on the education delivery in schools. Data analysis presents the access to eLearning facilities and its import to education delivery; examining the knowledge of platforms commonly used to access eLearning content; extent to which schools' administrators know about the potential benefits of eLearning for education delivery.

4.2.1 Extent of access to eLearning facilities by learners.

In order to establish the access to and whether there is enough knowledge on the existence of eLearning facilities, the researcher sought to know what respondents thought of the accessibility to eLearning facilities. The charts below summarises the findings.

Figure 4.2.0. Is there access to eLearning facilities?
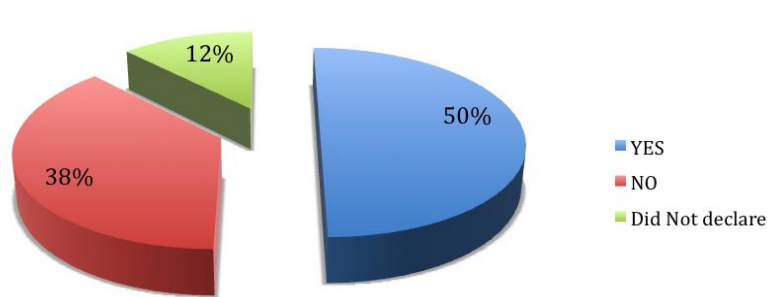
Data indicates that indeed 50% agreed that there is access to eLearning facilities, 38% disagreed with the question while 12% did not answer. This implies that the access levels are significant. However, this could be attributed to the fact that in most homes there is an eLearning device (a desktop computer, laptop, mobile phones, tablets etc.). This was confirmed by respondents in the focus group discussions. Surprisingly when asked to place the accessibility levels in schools in percentages *(see figure 4.2.1)*, data analysed indicated a less than 5% accessibility levels.

This implies that schools within the county are ill equipped and the few ICTs facilities in place are used for other purposes other than for learning. However this is in agreement with the findings of the Nairobi City Council Task report on education (2014, p.65), Oloo (2009) and Omwenga *et al* (2004) that implementation of eLearning in schools faces several issues, namely: poor prioritisation of ICT projects in schools, negative stakeholders perceptions, inadequate policies, inadequately trained teachers, lack of proper eLearning equipment's among others. In light of this, this study concludes that there is lack of appropriate eLearning facilities in schools.

The huge mismatch between the importance of eLearning and accessibility to eLearning facilities confirms that most schools are ill equipped with eLearning facilities and most learners who accessed eLearning tools did so at home, mostly through cyber cafes, mobile phones and other gadgets owned by their parents. On the contrary, learners in private schools did point out that they have eLearning facilities. In addition, parents in

these schools confirmed that they do pay computer lessons fees. However, they indicated it was not clear to them what kind of learning took place using computers in those schools. Although a majority indicates they are mostly being used for teaching basic computer skills, for instance, computer parts, how to use Microsoft Office etc.

The figure 4.2.1 below gives the analysis of the findings when respondents were asked to place percentage level on accessibility to eLearning facilities in schools.

Figure 4.2.1 how is the access level to eLearning facilities in percentages
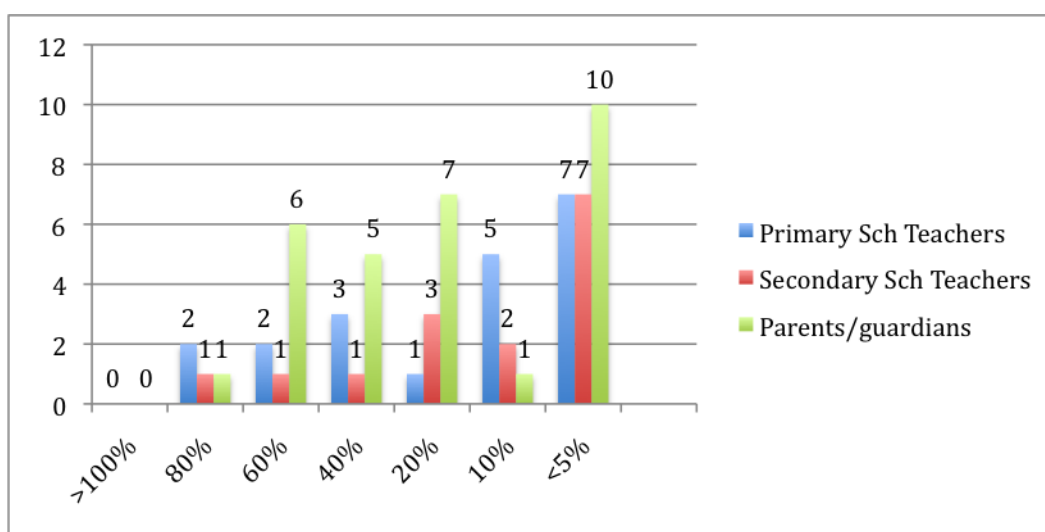
The above data is indicative of the real situation in most schools. This is proved by responses from teachers and learners who are a key stakeholder directly engage with the accessibility to eLearning facilities for learning purposes. Respondents were further asked whether they understood the import of eLearning to education delivery. Data analysed indicated eLearning is viewed as a critical component in education delivery today. This is because of the global trends influencing many human development sectors such as education that are keen on leveraging on technology to improve livelihoods.

Data from the three instruments used (interviews, focus group discussions and questionnaires) in this study indicates that 100% of parents and 95% of primary school teachers opined eLearning as critical to education delivery, but 40% of secondary school teachers said it doesn't simply because the government is concentrating on equipping

primary school, more so in lower levels. Furthermore, when asked about eLearning usefuless, a majority of respondents using likert scale indicated it is very useful.

Figure 4.2.3 How Useful is eLearning to learners
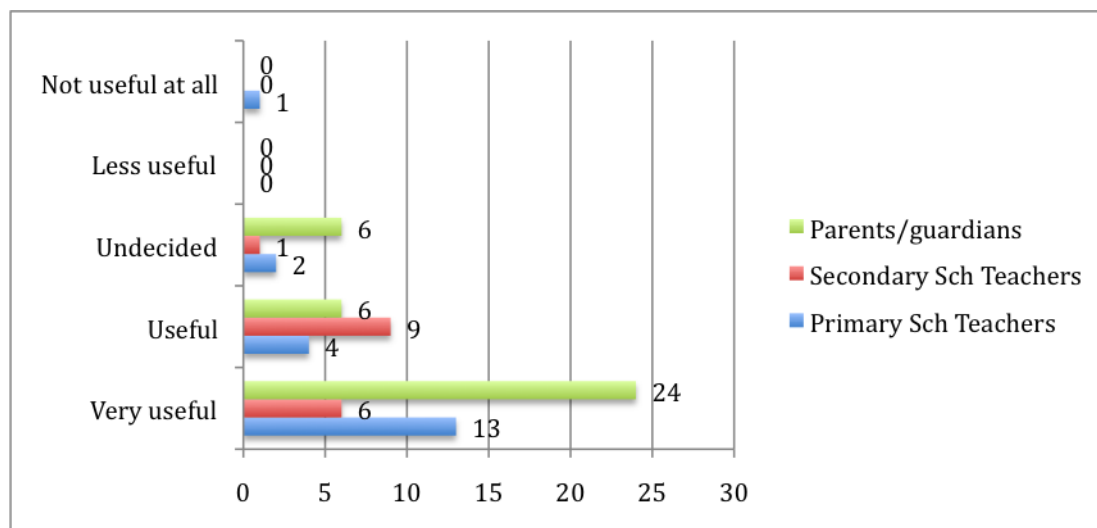
Figure 4.2.3 above presents data on usefulness implying that the need to leverage on eLearning to improve education delivery is very important. Findings are in agreement with Mensah (2014) that there is enormous potential in eLearning as cheap and flexible medium for education to facilitate the transformation of African economies. ELearning Africa Report (2015) for instance, indicates that 27.8% of pupils in West Africa reported to have acquired better knowledge and understood lesson better with content form ICTs.

The dynamic content simplifies learning while addressing challenges of teachers and textbook shortage, affordability of learning materials among others. Therefore, the study concludes that positive efforts towards an all-inclusive eLearning model implementation should be adopted. This is in order to realise an ideal human capital responsive to the needs of the 21st Century information age today by reducing low literacy and numeracy skills of learners at the very basic level reported in Kenya today[7].

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[7] See Uwezo report, www.uwezo.net

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Furthermore the study sought to find out whether schools administrators were aware of the potential benefits of eLearning in education delivery. Data analysed indicates that 80% of parents and primary school teachers believed school administrators understood the potential benefits, however 20% in that sample were of the contrary opinion. However, responses from the sample of secondary school teachers were split by half for those for and against the question whether schools administrator's understood the potential benefits. This could be attributed to the general feeling that the method of eLearning use in schools adopted by the government is living out secondary schools and other critical stakeholders out of the national eLearning implementation strategy. For instance, the government's efforts through MoEST, Kenya ICT directorate and various donor partners are mostly geared towards primary school teachers training on computer use, improving ICTs facilities in schools. This is in readiness for the rollout of the much publicised *Jubilee* laptop project now dubbed *DigiSchools*[8] project.

In addition, data from the key informant interviews and focus group discussions indicated that the potential benefits of ICTs for learning purposes cannot be underestimated. This is so because the world is in the information age, thereby knowledge and relevant competencies in ICTs are increasingly becoming necessary. Therefore, the need for a technologically savvy human capital is ever increasing, calling for a responsive and a results oriented mode of education delivery. [9]

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[8] GoK Digital literacy programme: http://www.icta.go.ke/digischool-presents-implementation-roadmap-to-parliament-and-senate-committees/
[9] MoEST Sessional Paper no 14 of 2012, (p 51).

Figure 4.2.4 Commonly used eLearning tools at school and at home.
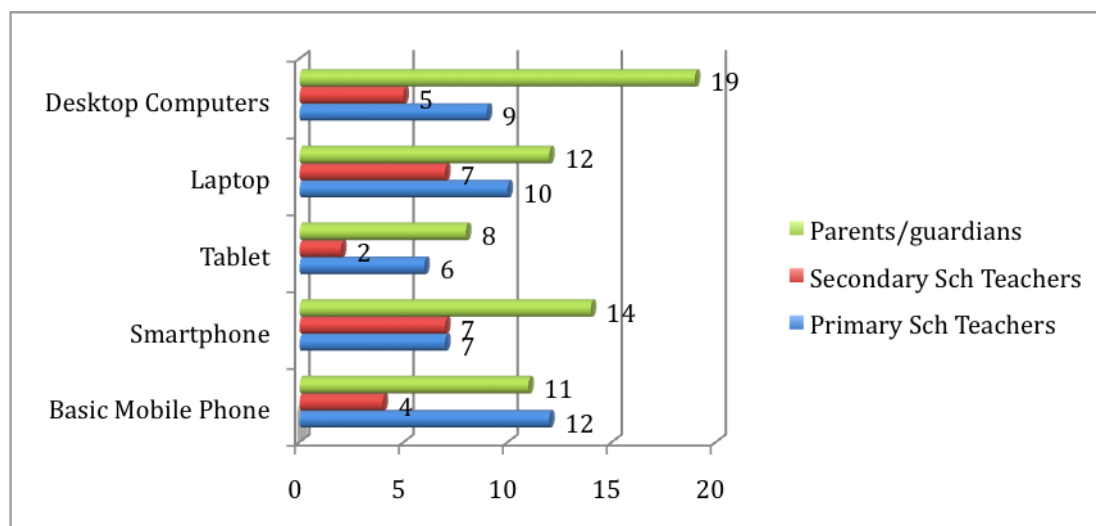
Furthermore, when asked about the most commonly used tool to access digital content, a majority of respondents from the sampled parents pointed out desktop computers as the leading device followed by smartphone, laptops, basic mobile phone then tablets. This can be attributed to the fact that most schools have automated some of their systems for instance, for record keeping and the day to day administrative processes. This agrees with the findings of Oloo (2009) which puts elearning at 7.14%. However, some public schools within the county received support from NGOs such as the *Worldreader*[10] to set up an eLearnng environments (*see figure 4.2.5*). Such an NGO provides basic e-reading devices loaded with relevant course content to learners. Further, most private schools have computer labs where parents pay for their children fees for computer lessons per term.

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[10] *Worldreader* is a non-profit organization on a mission to bring digital books to every child and his/her family, so that they can improve their lives, see more: http://www.worldreader.org/

Figure 4.2.5 Photo of eLearning environment learners using e-readers and desktop computers and laptops.

Source:Worldreader, 2015

Source:KICD, 2015

Data analysed from interviewed experts and teachers indicated that laptops as the leading device, followed by basic mobile phone, desktop computers, smartphones then tablets as the least used. This implies that an ideal digital learning environmemnt should engage learners in three 'C' of learning to a 21st century learner today, that is, *consume* (read and interpret text and imagary), *collaborate* (share and work with others to extend knowledge) and *create* (demonstarte the understanding of knowledge acquired to creatively to build *new* content, innovations). This kind of learning can be best achieved through desktop computers and laptops as eLearning devices. However this does not lock out the other devices, but supports since the government's universal content approach to

eLearning as opposed to device driven approach previously adopted but failed to materialise.

To understand futher why the prefered choise of device, the respondents were asked to give their opinion on how the felt in using the above devices. The responses were coded into four main categories as show in figure 4.2.6 below.

Figure 4.2.6 What was the users experience with the eLearning devices?
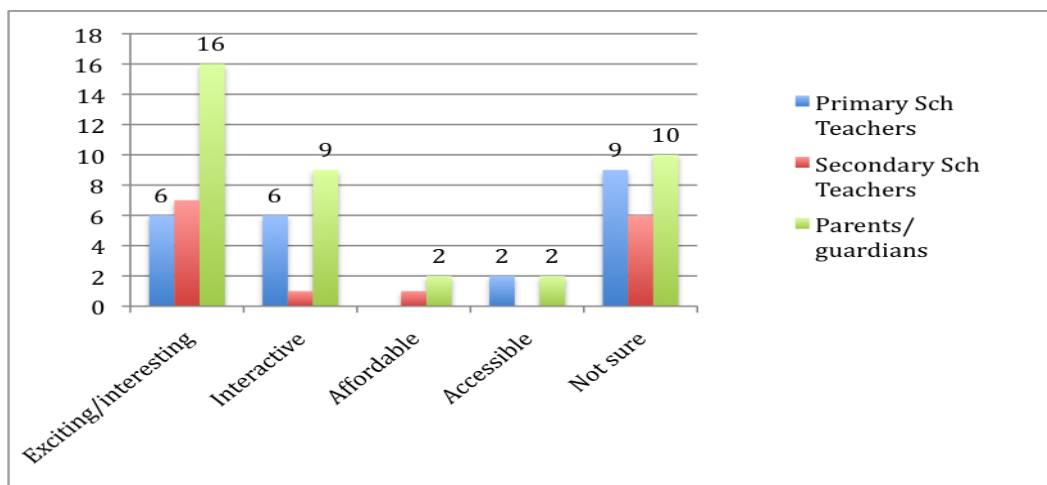
The above findings indicates that teachers and parents/guardians reported that learners got excited while interacting with this mode of education delivery. However, a significant number were not sure of their experience further confirming the findings of this study that there is a less than 5% accessibility levels to eLearning facilities and Oloo (2009) 7.14% in eLearning use in schools. Data analysed from key informants indicate that learners experience depends on their computer skills level and that *"...the higher the skills the more information they are able to get or access, hence ease of use and learning from the content therein"* These findings are in agreement with Aphek (2005), who posits that the mastery of using computers by children at early age are often better than adults. Therefore, the *net-generation* is an important pushers of development through innovations in socio-economic spheres in a society.

4.3   Determining the availability, accessibility and use of eLearning tools in schools.

This section presents data on availability and use of elearning materials in schools. Data analysis concentrated on determining whether there is relevant local digital content for educational purposes; exermining how that content is accessed in terms of platform; extent of what the learners use eLearning tools for and whether parents and teachers alike have come across any specific content which they could recommend for educational purposes.

4.3.1   Examining the availability and use of eLearning materials in schools.

To determine the availability and use of eLearning materials in schools, the researcher first sought to find out the availability of relevant local digital content to learners. Data analysed from interviews and focus group discussions indicated the availability of digital content as significantly minimal. However, a majority 60% questionnaire respondents, comprising parents/guardians and teachers, stated that content is available where 40% disagreed with the question. Furthermore, the respondents were asked whether learners have access to digital content. Figure 4.3.1 below presents the analysis of the findings. Interestingly, a majority of parents/guardian believed there is access to digital content where as teachers both in primary and secondary did point out the unavailability of such educational digital content.

Figure 4.3.1 Do learners have access to digital educational content?
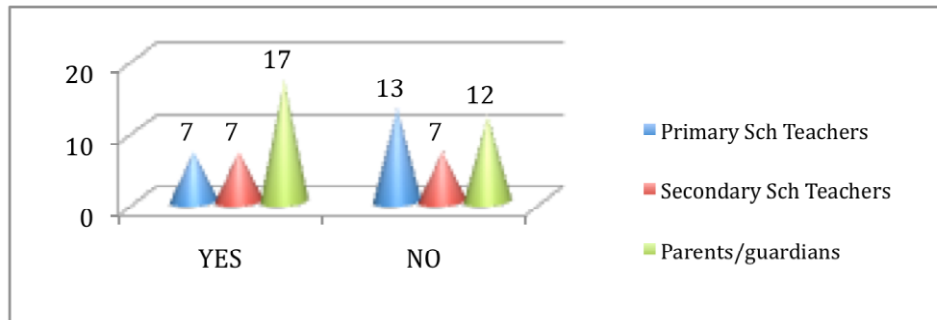
This shows that as much as relevant curriculum based digital content is largely unavailable, sometimes parents take the initiative to direct learners to useful content online, purchase e-books that come in CD/DVDs ROMS platforms or download relevant YouTube free lessons. Therefore the study concludes that, it is important for the government to avail curriculum based digital content alongside standard print course learning materials as part of its mandate. This will enable learners take advantage of the flexibility and dynamic nature of eLearning beyond the confines of a class.

When asked how they accessed the eLearning tools, the respondents said they use offline devices mostly but a considerable group also pointed out use of online devices. A few mentioned other electronic devices such as Radio and TV as ways they interacted with digital content. Data analysis findings are indicated in figure 4.3.2 below. However, the challenges of internet connectivity in terms of bandwidth costs and unavailability of local curriculum based digital content contributed to low percentage in use of online based digital content platforms. This limits the digital learning environment which entails consumption, collaboration and creation as learning outcomes.

Figure 4.3.2 How is digital educational content availed to learners?
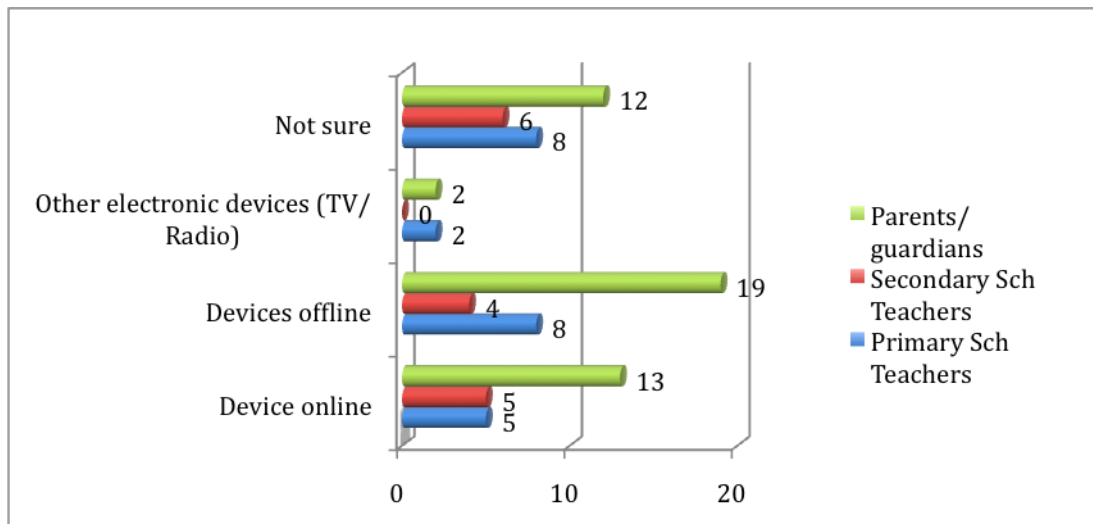
The findings indicates a significant number of respondents in all the categories were not sure about the availability of any of the common eLearning platforms (device online or offline) as well as the availability of relevant digital content. This shows that media literacy levels had a significant influence on their understanding of eLearning import in education delivery. Therefore, this confirms that most public schools lack the eLearning facilities as compared to private schools. This notwithstanding, the government should invest more in awareness creation to win more public support and attract more public private partnership initiatives in this dynamic sector of the society.

Interestingly when asked what learners used more when interacting with the few eLearning devices available to them, data analysis indicates a majority of responses highlighted use of social networking sites and entertainment/games *(see figure 4.3.3).* This was a worrying trend to most respondents indicating there was need for more local educational digital content and increased advocacy by relevant stakeholders on good use of eLearning tools. Key informant experts interviewed and parents reported that children use the devices to arrive at a gratification that comes with the features in the device and the interactive content.

Figure 4.3.3 what do learners use eLearning devices for most?
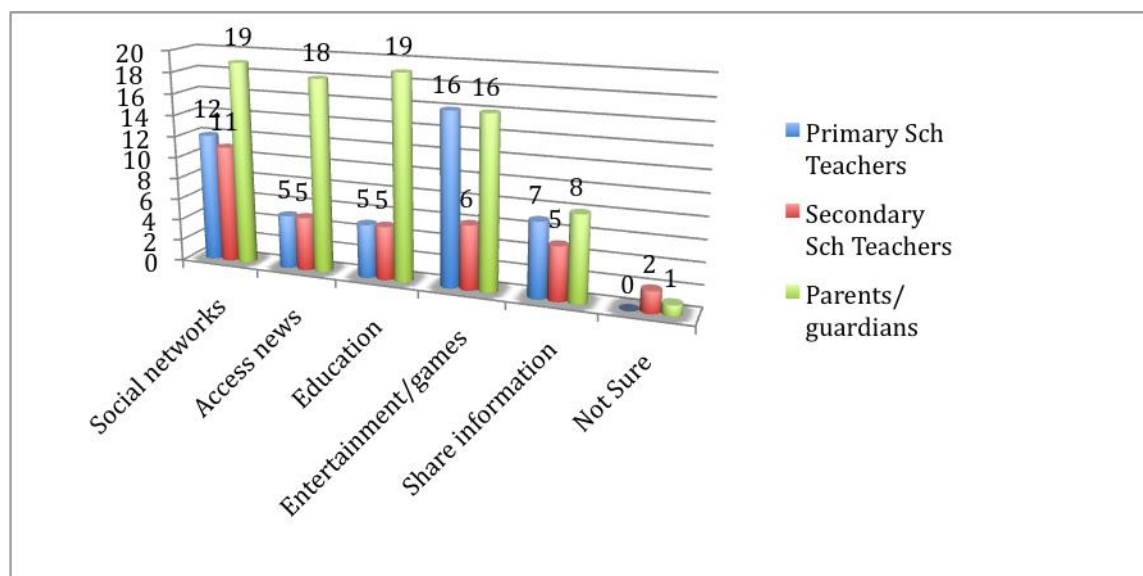
In both scenarios, use of devices for educational purposes by pupils/students scored less percentages as reported by teachers and parents. The above implies that the learners used eLearning devices for social media and games more than for educational purposes because there isn't curriculum based educational content. Learners also are also not taught or guided through the basic competencies in online information search as well as its usefulness or dangers. This findings highlight the theory of Expectancy-value that posits gratification sought by users is pegged on the expected value users place on the content or eLearning tools. It also agrees with cognitive theory of multimedia Learning (CTML), which postulates that people learn deeply from word and pictures than from word alone which are the key features of an eLearning model. Data from a key informant puts it as*"…a positive learning through discovery.' Gamified' learning solutions are especially engaging and fun to learners…"*

Furthermore, data from key informants interviewees and focus group discussions indicated that use of devices by learners is dependent upon their level of education. This could be another reason why most primary school children would prefer playing games and seeking entertainment gratification whereas secondary school students would prefer

social networking sites and Google more. This could be attributed to the following issues: there is less curriculum based e-content, most school going children visit estate gaming/cyber cafes without responsible adult supervision, or use parent's devices or personal ones where close monitoring on the proper usage of computing devices is not guaranteed. This explains why the government is currently running an awareness campaign to educate the population on the need to be on guard as to what children are exposing themselves to when going online by using data enabled phones or computers. This study therefore concludes that learners should be taught in school about information search and retrieval and use. In addition to putting in place a properly documented guide to learners on how to safely interact with digital content at their disposal.

In most schools, lack of devices, lack of a conducive eLearning environment, inadequate digital content, lack of relevantly-skilled teachers and/or technicians make computers classes achieve minimal impact on learners. In most cases they are taught basic computer skills. However, when asked whether they've come across any kind of digital content, significantly a majority reported yes. This is indicated by the findings below (*see figure 4.3.4*).

Figure 4.3.4. Have you come across any form of digital content or tools that were particularly useful for learning purposes (SMS, Mobile apps, Video games, etc)?
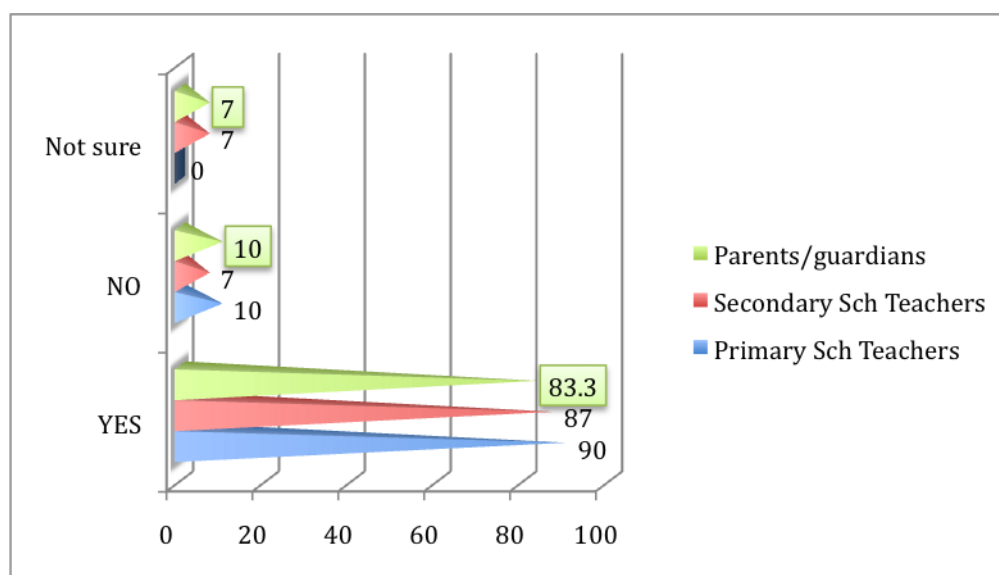
Data analysed indicates that most respondents have come across content or tools that could be of help to learners during education delivery. Common platforms named by respondents included: Mobile apps such as *Worldreader, binu, kytabu* and *ekitabu which* are majorly online repositories which are hardly accessed offline; *Khan Online Academy*; *Moodle* and *COURSERA* websites; local digital content providers/publishers such as KLB, Longhorn, OUP and MountainTop eBooks and video books (*vooks*).

This is explains the need for technology adoption for learning purposes to mitigate the challenges of accessibility and equality in education as pointed out in the Nairobi City Council Task force report on Education of 2014. Furthermore, Ndemo (2015) argues that the aim should be to make an education system that is dynamic and responsive to the needs of the beneficiaries. This therefore means the focus on eLearning implementation should incorporate its influence on learning outcomes as argued in the cognitive theory of multimedia learning by Mayer (2005).

4.4 Analysis of the influence of eLearning to education delivery in a standard classroom-based learning.

Data in this section presents the influence of eLearning on education delivery in standard classrooom-based learning. The researcher sought to find out the features that distinguish digital content from printed content and whether eLearning makes learners active partcipants. This will assist the researcher assess the import of eLearning to standard classroom-based learning.

4.4.1 Exploring the influence of eLearning to education delivery in standard classroom-based learning.

Respondents were asked to identify the unique features that digital content has which printed content didn't. This is to find out how digital content could be accessed and how it has improved learning processes.

Data analysed indicates 22% of responses considered fast and easy access to contents as the most unique feature the digital content has over print books, in total 81% could identify the unique features. However, 19% mentioned could not mention any *(see table 4.1)*. Data analysis findings could be attributed to fact that most key stakeholders mostly in governement have inadequate knowledge on the import of eLearning to education and are mostly driven by private interests. Thus confirming the negative attitude and perception among the key decision makers in the education sector. This is due to the lack of an all-inclusive stakeholders participation during policy fomulation and in the development of schools curriculum. The frequency table 4.1 below presents the data analysed on the distinguishing features of digital content that puts it ahead of printed content.

Table 4.1 Distribution of responses regarding unique features of digital content

Features	Frequency	%
Flexibility/portability	12	12%
Enables multiple access/collaboration	10	10%
Fast access to content	22	22%
Provides a variety of knowledge/information	13	13%
Interactivity	13	13%
Simplification of complex concepts	11	11%
Did Not Answer	19	19%

This notwithstanding, data findings projects eLearning as the ideal way to a realise an education delivery method that is effective and efficient. By way of addressing barriers to education delivery, time constraints, entrance requirements, and geographical distances, socio-economic, cultural and gender issues pointed out by Omwenga *et al* (2004) in his findings.

Responses from focus group discussions on features of eLearning content

Below are sampled responses from focus group discussions when to highlight the features that make digital content in eLearning a component that brings in effectiveness and efficiency during the learning process.

- *"Unlike print books, digital content is easily accessible and used anywhere, anytime…errors can be detected and corrected promptly"*
- *"It makes learners curious about the content and the device operations thus making learning an interesting exercise"*
- *"A single device can carry an entire library which is good for us when learning or revising"*
- *"The interactive nature of eLearning keeps the us alert during the learning process…it is not boring like flipping pages"*

Sampled responses from key informant interviews on features of eLearning content

- *"You can easily refer to something within a huge volume of books or even Google-it".*
- *"Digital content make certain features appear real and bring life to abstract notions/concepts for example video or animated content"*
- *"It allows seamless learning…"*

Figure 4.4.1 do eLearning tools make learners active participants?
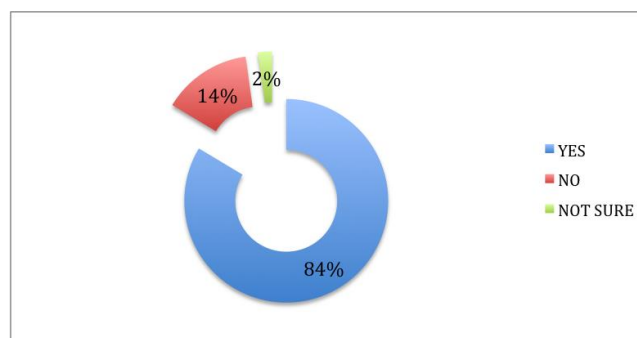
Concequently, respondents were asked whether eLearning tools made learners active participants during the learning process. Data analysed showed that a majority of respondents 84% believed it does while 14% thought it does not make learners active. This shows that eLearning is the ideal way to address the three 'Cs' (*consume, collaborate and create*) of 21st century learning today as pointed out by *intel* corporation (www.K12BluePrint.com). Futhermore, this could contribute in building their literacy and numeracy skills to learners at basic levels which are dwindling in Kenya. eLearning could help lower the high rate of pupils in class two who do not have the basic competencies in numeracy and literacy as reported by *UWEZO* Survey (2013)[11].

Data presentation above is confirmed through the following sampled responses given below from key informant/experts interviews as well as an open ended question in the questionnaires regarding their opinion on whether learners become active participants during the learning process.

Sampled responses from key informant interviews influence of eLearning to education delivery.

- *"By boosting interest among learners eLearning makes them active knowledge seekers"*

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[11] The evidence has remained constant…Many children in East Africa have no learning basic competencies during the early years of primary school (as per national curricula). See more country specific reports at *www.uwezo.net*

- *"Learners are less detracted as they can concentrate on a given session hence adapt the learning to their individual learning behavior"*

- *"It encourages independence but on the contrary it has made learners lazy by enabling them to copy paste information direct from online sources such as Google…"*

- *"Accessing content, collaboration and feedback mechanism makes learning interesting thus making them active participants"*

- *"Retention to information is high…inclusion of immediate feedback allows for active learning and interaction"*

- *"There is a high expectation that they should through collaboration"*

- *"Some tech-savvy learners want to show off their skills making the other learners eager to participate in the learning process including their teachers."*

- *"eLearning tools such as the laptops and desktop computers facilitate production and consumption unlike other devices (tablets and phones) which promote purely consumption only." … Learners become more active and innovative when a learning environment provides a platform for providing solutions for example computer programming or coding"*

Sampled responses from open ended question in the questionnaire

- *"The interactivity and navigation processes allow them to discover a lot of things however we must put in place control mechanisms"*

- *"eLearning environment is very motivating from learning how to navigate the content, playing games to operating the devices is quite fulfilling…"*

- *"Learning that takes care of all the sensory organs is fascinating to learners"*

- *"Learners become active participants when the content is delivered in a user friendly mode." "… A presentation that is tailored to arouse curiosity in the learners mind prompts a participatory approach to problem solving during learning process"*

- *"Fun learning makes learners active participants in class."*

The responses above imply eLearning can mitigate some of the perennial challenges in standard classroom based learning.

4.5 Analysis of the appropriate solution to the challenges facing eLearning uptake.

Data presentation in this section analyses the challenges and possible solutions that influence eLearning adoption in the education sector. It examines the obstacles, solutions and priority areas that could address the issues of concern in the delivery of educational content.

Table 4.2 Distribution of responses on obstacles that hinder eLearning uptake.

Significant Obstacle	Frequency				
	Pry Sch. Teachers	Sec Sch. Teachers	Parents/g uardians	Total score	%
1) Inhibitive initial & maintenance costs	8	10	17	35	**32%**
2) Low computer literacy skills among teachers, school administrators and learners (technophobia)	11	8	16	35	**32%**
3) Unavailability of proper digital content	0	0	2	2	**2%**
4) Inadequate infrastructure (electricity, storage rooms)	9	8	9	26	**24%**
5) Internet connectivity	0	0	2	2	**2%**
6) Did Not Answer	4	1	3	8	**8%**

Data above indicates that inhibitive initial and maintenance costs at 32%, low computer literacy skills at 32% and inadequate infrastructure at 24% are the major issues slowing down eLearning adoption in schools. Surprisingly, digital content availability and Internet

connectivity scored low at 2% each. This implies that stakeholders view digital content and connectivity as secondary to the major issues such as costs and low computer literacy skills, which directly impact the entire education delivery. This could be attributed to the fact that most respondents didn't quite comprehend what entails eLearning pedagogy.

Similarly key informant interview respondents pointed out the chronic negative attitude towards technology for education in Kenya contributed to improper policy formulation and implementation by the legislature and the executive arms of government. For instance, citing the *Jubilee* laptop project (now *Digischools* project) for class one has failed to materialize due to various issues key among them being endless procurement bottlenecks and lack of a clear implementation strategy. Therefore, the relevant bodies tasked with the provision of eLearning devices to schools should come up with a clear strategy open to public scrutiny on how to implement eLearning in schools.

Further, the researcher sought to find out what could be done to solve the problems preventing eLearning adoption in schools. Data presented below *(see Table 4.3)* shows that respondents believed it's the government's duty to provide and facilitate effective and efficient basic education as provided for in the constitution[12]. Data analyzed also placed mostly teachers and parents as part of the problem that impedes eLearning adoption. This is due to the negative perceptions on ICTs use in an education system and inadequate competencies in eLearning technologies. Therefore, there is a need to create more awareness on eLearning as it is entrench as a complementary method of education delivery to standard classroom based education.

Sampled responses from key informant interviews regarding issues bedeviling eLearning

- *"Most schools do not have adequately skilled ICT personnel to support/supplement teachers"*

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[12] Constituion of Kenya 2010, Article: 53 1 (b), 43 1 (f), 54 1 (b), 55 1 (a) and (b).

- *"Inadequate training for teachers … Teacher Training Curriculum on computer studies is concentrates on basic Ms Office skills…"*

- *"There is no syllabus or a defined curriculum guide for primary school pupils on eLearning or computer studies."*

- *"Lack of realistic controls/roadmap on access to harmful information"*

- *"There is no clear policy or even an implementation strategy on eLearning in schools"*

- *"There is a great impediment as a result of negative attitude on eLearning among stakeholders"*

- *"Lack of serious GoK support"*

- *"Most schools do not have adequately skilled ICT personnel to support/supplement teachers"*

- *"Politicization of education issues is rampant in this country"*

Sampled responses from focus group discussions regarding issues bedeviling eLearning

- *"Most public primary schools lack computer labs unlike their counterparts in private primary schools. This disadvantages the learners in public schools"*

- *"We are only taught how to use computers to draw using Ms Paint and to type using Ms Word"*

- *"Time allocated for computer lessons is not enough and the course content not good"*

Table 4.3 Distribution of responses on the major solution to obstacles.

Possible solutions to the obstacles	Frequency				
	Pry Sch. Teachers	Sec Sch. Teachers	Parents/g uardians	**Total score**	**%**
Full GoK support for eLearning uptake (e.g. provide facilities, infrastructure etc).	18	11	22	51	**55%**
Training teachers and learners.	10	8	13	31	**34%**
Did Not Answer	4	1	5	10	**11%**

Table 4.4 Distribution of responses on what needs to be prioritized by education stakeholders to facilitate eLearning.

Priority Areas	Frequency			
	Pry Sch. Teachers	Sec Sch. Teachers	Parents/g uardians	Total score
1) Training teachers on eLearning	10	8	10	**28**
2) Provide adequate ICT Infrastructure (electricity, storage and maintenance, connectivity, etc)	8	12	20	**40**
3) Provide eLearning devices	10	4	3	**17**
4) Awareness creation on digital learning	3	1	7	**11**
5) Encourage involvement of PPP	0	0	1	**1**
6) Make quality local content available	3	1	4	**8**
7) Did Not Answer	1	1	4	**6**

Figure 4.5.0 Distribution of responses on what needs to be prioritized by education stakeholders to facilitate eLearning in percentages.
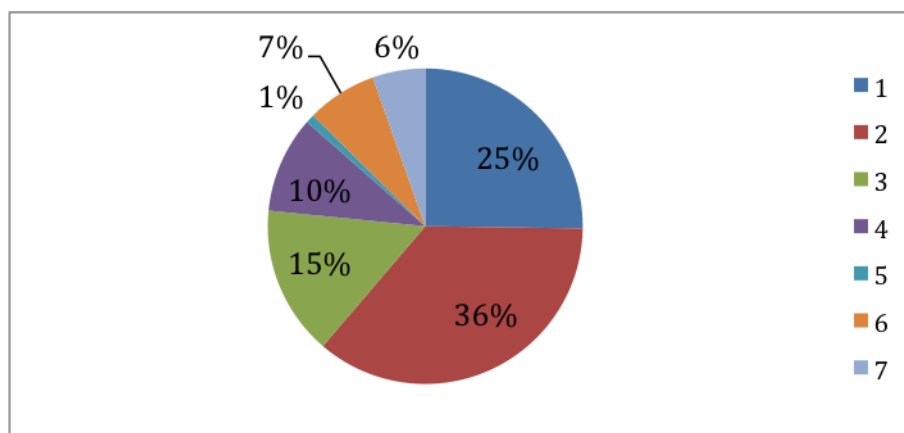
Data findings above indicate 36% and 25% of responses places much emphasis on provision of adeqauate eLearning facilities and training of teachers as critical to eLearning use success. 15% and 10% responses indicate provison of eLearning devices and awareness creation as important in ensuring smart learning in schools. Data presentation in table 4.4 and figure 4.6 implies that the priority areas are clear and that the government going forward needs to put in place a proper strategic policy to guide the implementation of eLearning in schools. Therefore, the stakeholders' in the education sector especially the

government needs to channel enough funds and efforts towards development of global friendly strategies[13]. Castells (1996-1998) in his theory of globalisation, postulates development today as one that is following the new system of information capitalism brought about by the internet and innovations in sectors such as education. The study concludes that to yield an ideal human capital ready to participate in the dynamic global arena, the education system should embrace ICTs and ensure local contend is available in plenty.

Sampled responses from key informant interviews on solutions to obstacles

- *"Government need to increase awareness on the capabilities of eLearning in schools for education delivery… and teach teachers on technology in education"*

- *"GoK needs to come up with clear policy on eLearning and a realistically sustainable implementation strategy"*

- *"Encourage PPP and zero rate all possible eLearning devices"*

- *"Teacher training should be revamped to include how to and use of multimedia/digital content"*

- *"Create room for new nontraditional models of education delivery to encourage innovations."*

- *"Change the approach from device driven to digital course content driven approach to eLearning adoption in schools"*

- *"Sensitize stakeholders in the education sector and make them part of the teams to coming up with an ideal solution in education sector."*

- *"Key donors and partners in such as WorldBank, DFID and USAID have been concentrating on provision of funding for schools infrastructure. They have now added educational content as an area of concern due to the extremely low literacy*

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[13] Globally, eLearning plays a vital role in the provision of education services and is fast becoming an important aspect of all educational systems and the most cost-effective way of providing education. *Dr. Aida Opoku, Special Advisor, Post-2015 Development Agenda, UNECA see more: eLA Report 2014.*

and numeracy levels witnessed in Kenya and other sub Saharan countries pressing

stakeholders of the need to have a sustainable provision of quality content"

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Sampled responses from focus group discussions on solutions to obstacles

- *"Introduce reward systems to encourage teachers and learners as way to encourage computer literacy skills adoption"*

- *"Create a conducive learning environment for eLearning in schools, for instance, have proper desks, storage facilities, power supply among others to enable proper use of devices in schools."*

- *"Avail moderated digital course content"*

- *"Let us have easy to use devices in our schools"*

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0   Introduction

The study looked at development communication in education focusing on eLearning in selected primary and secondary schools and its influence on the standard classroom-based mode of education delivery. This chapter presents the summary of the key findings, conclusion, recommendations and suggestions for further research.

5.1   Summary of the study

The purpose of this research was to interrogate development communication in education by conducting an analysis on eLearning in selected schools in Nairobi County while explore the import of eLearning paradigm in the education system. In addition, the study aimed at interrogating the possible ways of making the education system responsive to the dynamic and technology savvy children growing up in the 21st Century information Age. Four research objectives were formulated. Research objective one sought to establish the role and influence of eLearning in education delivery. Research objective two aimed at determining the availability, access and use of eLearning materials in schools in Nairobi County. Research objective three sought to explore the influence of eLearning to standard classroom-based learning and education delivery in NCC. Finally research objective four sought to interrogate the appropriate solutions to the challenges facing eLearning uptake in schools.

This study used a mix of qualitative and quantitative research techniques that comprised collection of data using questionnaires, key informant interviews and focus groups. The total sample size was therefore 10 key informants, 35 teachers, 30 parents/guardians and 60 learners in both primary and secondary schools totaling up to 135 respondents.

Findings of the study show that a majority of stakeholders acknowledged eLearning

is very useful for learning purposes. 80% of respondents understood the potential benefits of eLearning while 20% did not. However, there is a huge mismatch in the perception of its usefulness among the respondents. This was attributed to several factors for instance, the fact that most teachers lack basic competencies in ICTs and others were influence by the fear of technologies. There are unending wrangles and politicization of education matters by some key stakeholders. This has occasioned bottlenecks in the procurement of the educational facilities.

Furthermore, the study findings indicated that the existing lapse in the adoption of eLearning in most schools especially those that are owned by the public was due to lack of eLearning equipment's and educational facilities. A majority of respondents did indicate the access levels to eLearning facilities at less than 5% in all schools sampled. However, due to curiosity expressed by the learner, majority indicated that on various occasions they used estate cyber cafes, parents/guardian and friends gadgets to access information while perfecting their competencies in computer use. Moreover, the study revealed that secondary school learners access social media websites and search engines such as Google more than educational content while the primary school pupils indicated playing games and entertainment.

The study findings also indicated that several critical factors influenced the current condition of eLearning in schools within the county. They were: lack of a responsive curriculum for computer studies in primary school level and an inadequate syllabus for secondary school level; inadequate infrastructure to support eLearning in most learning institutions; low computer literacy skills among the trainers/teachers; inhibitive initial and maintenance costs associated with eLearning devices; the lack of relevant local digital course content; negative attitude and perceptions on use of technology for educational purposes by key stakeholders.

Further the findings indicated that a need to create more awareness on the potential benefits of eLearning in schools must be prioritized in order to mitigate perennial challenges such as lack of school textbooks. The findings also points out that there is need to avail relevant local content and creation of a conducive learning environment for eLearning in schools, for instance, having proper desks; storage facilities; power supply among others to enable proper use of devices in schools. Learners in a digital environment consume, collaborate and create *new* content; therefore, digital content developers can facilitate positive learning through discovery by way of *'Gamifying'* learning solutions.

Further the study found out that learners enjoy using computing devices during learning as well as for leisure purposes. Therefore the need to have relevant local digital content production enhanced must be prioritized to enable proper utilization of eLearning in schools. This creates an opportunity for innovative solutions that aim to improve on education delivery for instance, development of mobile applications, software and digital content provision.

5.3   Conclusions

Based on the findings, the study concluded that there was significant knowledge on eLearning and its import to education delivery by a majority of the stakeholders in the education sector. However measures to equip teachers with relevant skills must be given priority in addition to provision of eLearning infrastructure and devices. This will enable teachers meet the expectations of parents and that of a tech savvy 21st Century learner, whose learning environment is defined by three critical competencies namely: consume, collaborate and create.[14]

The need to reverse the low access level to eLearning facilities requires the following to be done: *'Depoliticisation'* of issues in the education sector, having all the stakeholder on board during deliberations of technology adoption and having a consistent

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[14] See www.K12BluePrint.com

presentation model for all. Further the study shows that most learners visit cyber cafes and use parents or friend's devices to play games and visiting social websites, which poses a risk to young minds if exposed to harmful information bringing in the need to seal loopholes by educating learners on the proper use of eLearning devices.

Public schools are worst affected due to lack the basic learning facilities, hence impacting negatively towards eLearning adoption in schools. This means the government, which is mandated by law to provide basic education should to invest more and invite PPP in building eLearning infrastructure in schools, train teachers and learners on relevant competencies in computer skills acquisition. This will help achieve equity and equality in education and improve on the quality of content delivered to learners at an early stage.

Data further concluded that eLearning uptake requires a change of attitude towards technology and the identification of priority areas by the government and other key stakeholder. The study puts provision of adequate infrastructure at 36%, relevant training on eLearning for teachers at 25% and making devices available to learners at 15% as critical success factors to the implementation of eLearning in schools. There is also a need to create more awareness on the potential benefits of eLearning in schools in order to mitigate perennial challenges such as lack of school textbooks and other learning materials.

The study concluded that there is need to avail relevant local content and creation of conducive learning environment for eLearning in schools, for instance, having proper desks; storage facilities; power supply among others will enable proper use of eLearning devices in schools. This therefore means, through its mandate KICD should provide proper guidelines to content developers on digital content development and its evaluation criteria. The institution together with all the stakeholders in the education sector should come up with strategic policy and an appropriate eLearning model to guide the proper implementation of eLearning in schools.

KICD should also endevour to develop a robust curriculum that is responsive to needs of dynamic and rapidly growing tech-savvy generation in Kenya. The study also concluded that eLearning is envisioned as the almost unlimited access to knowledge, information and global communication. Therefore, to yield a quality human capital ready to participate in the dynamic global arena, the education system should embrace ICTs and ensure local digital content is available in plenty.

5.3 Recommendations

Based on the findings in this study, the following recommendations were made:

a) ELearning should not only be introduced to the education system in terms of the technologies therein but more as an effective and efficient mode of learning (eLearning pedagogy). This therefore means an eLearning model acceptable to all stakeholders should be put in place.

b) To change the mindset of some stakeholders in education sector, the government of Kenya in conjunction with the county government of Nairobi should prioritize awareness creation and conduct civic education to make it clear to all what entails eLearning in schools. The focus should be on its importance to education delivery as well as the potential benefits, which outweighs the negative impact of ICTs in education.

c) To ensure sustainable access and availability of eLearning in schools, the government should provide eLearning equipments. This should be guided by the felt needs of the beneficiaries. For example, provide electricity, Internet connectivity, proper classrooms and desks, networking devices, storage facilities among others.

d) The government should provide support for local content development by providing a robust ICT infrastructures and reduction of taxes on ICT equipment for education. This should encourage more including learners to venture into digital content provision and produce enough dynamic local content that is attractive to learners. This will enable

learners find educational value in the eLearning tools, therefore putting them into proper use. Furthermore, KICD should provide proper guidelines to content developers on digital content development.

e) GoK and NCC governments should develop an implementable strategic policy on eLearning in schools. Such a blue print will provide clear guidelines on procurement procedures, funds allocation, timelines among other things geared towards smooth implementation of eLearning in schools. For instance, the policy should clearly state amount of funds required per school, what equipment's to purchase, what competencies are needed on among other things.

f) The government should embark on proper training of teachers on eLearning pedagogy. The scope of training curriculum should be widened from basic computer skills to incorporate competencies in eLearning devise operations, content creation and peer review.

g) To meet the high costs that come with such ventures mentioned above, the government and schools should integrate PPP, NGOs and donors agencies in the implementation of eLearning projects in schools. In addition, the central government must play a supervisory role in order to avoid duplicity of roles, wastage of resources or introduction of inappropriate content to learners and keep in check the negative influences of globalization.

5.4   Suggestions for further research

In light of the limitations and delimitations of this study, the following suggestions for further research were made:

a) That a study on an ideal eLearning model for the Kenyan learner be conducted in order to provide a road map for sustainable implementation of eLearning in schools country wide.

b) That there be a comparative study on the eLearning pedagogy in public schools verses private schools and how it affects the transition from one educational level to the next.

c) A study on eLearning pedagogy and its import to development of an ideal human capital in a technologically driven global environment, should be conducted.

d) A study on the influence of digital learning environment to children be conducted to investigate the relevance of competencies to the development agenda.

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APPENDIX I: Sample questionnaire

Researching eLearning in selected schools within Nairobi County

I am a Postgraduate student at the University of Nairobi, pursuing a Master of Arts Degree in Communication Studies-Development Communication option. I am conducting a research study titled ***Development Communication in Education: An analysis of eLearning in selected schools in Nairobi County.***

The general objective of this study is to explore the influence of eLearning (ICTs) in education delivery and find out its contribution towards social change for sustainable development. It also attempts to interrogate the possible effective ways of making the education system responsive to the needs of the dynamic tech-savvy children growing up in the 21st Century information Age.

PART A: BIO DATA *(Please tick √)*

District...	

SEX	MALE ☐ FEMALE ☐
AGE	*18-24* ☐ *25-29* ☐ *30-34* ☐ *35-39* ☐ *40-55* ☐ *>55* ☐
HIGHEST LEVEL OF EDUCATION REACHED	*O - Level education* ☐ *Tertiary College* ☐ *A – level education* ☐ *University education* ☐ *Others,* *Specify...*

The information given herein will be treated with utmost confidentiality. The identity of the respondent and all matters connected related to this discussion will remain confidential.
Please note;
- *Please attempt to answer all questions.*
- *There is no **right** or **wrong** answer therefore be as spontaneous as possible.*

PART B QUESTIONS:

1. **Examining the role of eLearning in education.**

   a. Do schools have access to eLearning facilities?
   (Please tick √) Yes ☐   / No ☐

   (i)   How are the access levels in percentages? *(Please tick √)*

   Over 100% ☐ *80%* ☐ *60%* ☐ *40%* ☐ *20%* ☐ *10%* ☐ *Less than 5%* ☐

   b. Do you think eLearning/ICT facilities could be of help in education

   delivery?

(Please tick √) Yes ☐ / No ☐

c. Which ICT tools/devices do learners commonly use to access digital content either in school or at home? (***Multiple answers accepted***) *(Please tick √)*

Laptop ☐ ***SmartPhone*** ☐ ***Desktop Computer*** ☐ ***Tablet*** ☐ ***Basic mobile phone*** ☐ Others *(Please specify)*

_____

d. What was their experience with the above device (s) if any?

e. How useful is eLearning in schools for education purposes? *(Please tick √ one)*

Very useful ☐ ***Useful*** ☐ ***Undecided*** ☐ ***Less useful*** ☐ ***Not useful at all*** ☐

f. Is the school administration adequately aware of the potential benefits of eLearning for education delivery? *(Please tick √)* Yes ☐ / No ☐

2. **Determining the availability, access and use of eLearning materials in schools.**

   a. Do learners use or have access to digital content? *(Please tick √)* Yes ☐ / No ☐

   b. How do they access eLearning facilities? _____

   c. What do learners use eLearning devices for most? (***Multiple answers accepted***) *(Please tick √)*

	(√)
1. Social networks/private communication (Facebook, Instagram, Twitter etc)	☐

2. Access information/news	☐
3. Education/Training	☐
4. Entertainment/games	☐
5. Share information	☐

    d.   Have you come across any specific content or tools (Websites, SMS service, ebook, Mobile Application, Video game etc) that are particularly useful for learning purposes? *(Please tick √)* Yes ☐ / No ☐

3. **Analysing the influence of eLearning to education delivery in standard classroom-based learning.**

    a. Do you know of any unique features that digital content have that printed books don't have?

    b. Does eLearning tools/devices make learners active participants during the learning process?

4. **What is the appropriate solution to the challenges facing eLearning uptake.**

    a.   What do you consider as the most significant obstacle that prevents eLearning adoption in schools?

b. What would be the solution to the obstacles you have mentioned?

c. Is there enough support to develop or increase digital skills and media

literacy in schools? *(Please tick √)* Yes □   /No □

Who is providing this support?

d. What do you think should be prioritized by the government (central and

county) to boost eLearning literacy skills in schools?

----------------THANK YOU FOR YOUR TIME-----------

APPENDIX II: Sample key informant interview protocols

Researching eLearning in selected schools within Nairobi County

I am a Postgraduate student at the University of Nairobi, pursuing a Master of Arts Degree in Communication Studies-Development Communication option. I am conducting a research study titled, ***Development Communication in Education: An analysis of eLearning in selected schools within Nairobi City County.***

The general objective of this study is to explore the influence of eLearning (ICTs) in education delivery and find out its contribution towards social change for sustainable development. It also attempt to interrogate the possible effective ways of making the education system responsive to the needs of the dynamic tech-savvy children growing up in the 21st Century information Age.

Place of interview…………………………… *<Time/Date>*…………………………………….
<Region>…………………………………….*<District>*…………………………………….……

The information given herein will be treated with utmost confidentiality. The identity of the respondent and all matters connected related to this discussion will remain confidential.

Guiding Questions

Opening remarks *(Introductions. Give a background. Thank you for agreeing to meet with me. Am interested in your views regarding eLearning use in schools in Nairobi County).*

What is the role of eLearning in education?

1. How is the access to eLearning facilities schools in Nairobi County? What's the percentage?

2. Do you think eLearning could be of help to education delivery in the Nairobi County?

3. How does the information and knowledge from the eLearning tools/media influence learners' behaviour?

4. Are educators aware of the potential benefits of eLearning in education delivery?

How are the availability, access and use of eLearning facilities in schools?

1. How do learners access and/or use eLearning facilities?

2. Is there an ideal device/tool you would recommend for eLearning purposes? Why?

3. Do you think learners have adequate access to digital content?

4. How effective is eLearning in schools for educational purposes?

Do eLearning facilities enhance delivery of education in a standard classroom-based learning?

1. What features distinguish eLearning from standard-class room education delivery?

2. Do you think eLearning tools/devices make learners active participants during the learning process?

3. Are educators/educational stakeholders in aware of the potential benefits of eLearning in schools?

4. Are there specific content or tools (ebook, Websites, Mobile Application, SMS Service, online/offline Video Games etc) that are particularly useful for learning purposes?

What is the appropriate solution to the challenges facing eLearning uptake in Nairobi County?

1. What do you consider to be the most significant obstacle preventing eLearning adoption for education delivery?

2. What skills are necessary for one to be able to use eLearning tools/facilities?

3. Is there enough support in schools to develop or increase eLearning skills and media literacy? Who provides this support?

APPENDIX III: Sample focus group discussion questions

Researching eLearning in selected schools within Nairobi County

I am a Postgraduate student at the University of Nairobi, School of Journalism pursuing a Master of Arts Degree in Communication Studies-Development Communication option. I am conducting a research study titled ***Development Communication in Education: An analysis of eLearning in selected schools within Nairobi City County.***

The general objective of this study is to explore the influence of eLearning in education delivery and find out its contribution towards social change for sustainable development. It also attempt to interrogate the possible effective ways of making the education system responsive to the needs of the dynamic tech-savvy children growing up in the 21st Century information Age.

Place of Discussion…………………………………… *\<Time/Date\>*…………………………………… *\<Region\>*…………………………………………………*\<District\>*…………………………………………… ……	
STUDENTS …………… **PUPILS** ………………	Form ………………………… *Class* ………………………… Male ………………………… *Female* …………………………

The information given herein will be treated with utmost confidentiality. The identity of the respondent and all matters connected related to this discussion will remain confidential.

Guiding Questions

Opening remarks *(Introductions. Give a background. Thank you for agreeing to meet with*

me. Am interested in your views regarding eLearning use in schools in Nairobi County).

What is the role of eLearning in education?

1. Have you used eLearning tool(s)/device before? Which one?

2. What was your experience?

3. How useful is eLearning in delivery of education in schools?

4. How does the information and knowledge from the eLearning tools/media

   influence your learning?

5. Is your school administration adequately aware of the potential benefits of

   eLearning facilities for education?

How are the availability, access and use of eLearning materials in schools?

1. Do you use or have access to digital content?

2. What content were you accessing?

3. What kind of eLearning device/tool did you use to access the digital content?

4. What do your opinion about eLearning in general?

5. Which device/tool do you prefer for eLearning purposes? Why?

Does eLearning enhance the delivery of education in standard classroom-based learning?

1. What features did you like about digital content compared to print books?

2. Do you think eLearning tools make learners active participants during the learning process?

3. Have you come across specific content or tools (SMS service, Websites, ebook, Mobile Application, Video game etc) that are particularly useful for learning purposes?

What is the appropriate solution to challenges facing eLearning uptake in Nairobi City County.

1. What are the challenges facing eLearning adoption in your schools?

2. What do you consider as the most significant obstacle that prevents adoption of eLearning in schools?

3. What skills are necessary for one to be able to use eLearning tools/facilities?

4. Is there enough support in your school to develop or increase your eLearning skills and media literacy? Who is providing this support?

APPENDIX IV: List of secondary schools in Nairobi county

Public Secondary Schools in Nairobi County

1. AQUINAS HIGH SCHOOL – Boys Boarding
2. HIGHWAY SECONDARY SCHOOL – Boys Day
3. HURUMA GIRLS' HIGH SCHOOL – Girls Day & Boarding
4. OUR LADY OF MERCY SECONDARY SCHOOL SOUTH B – Girls Day
5. OFAFA JERICHO HIGH SCHOOL – Boys Boarding
6. NILEROAD SECONDARY – Girls Day
7. ST. TERESA'S BOYS SECONDARY SCHOOL – Boys Day
8. MAKONGENI SECONDARY SCHOOL – Mixed Day
9. RUARAKA HIGH SCHOOL – Mixed Day
10. BURUBURU GIRLS SECONDARY SCHOOL – Girls Boarding
11. OUR LADY OF FATIMA SECONDARY
12. BABA DOGO SECONDARY SCHOOL – Mixed Day
13. C.G.H.U SECONDARY SCHOOL – Mixed Day
14. EASTLEIGH HIGH SCHOOL – Boys Day
15. MAINA WANJIGI SECONDARY SCHOOL – Mixed Day
16. UHURU SECONDARY SCHOOL – Boys Day
17. KAMUKUNJI SECONDARY SCHOOL – Mixed Day
18. O.L.M SHAURI MOYO GIRLS SEC. SCHOOL – Girls Boarding
19. JAMHURI HIGH SCHOOL – Boys Day
20. PARKLANDS SECONDARY SCHOOL – Boys Day
21. PUMWANI SECONDARY SCHOOL – Boys Boarding
22. NGARA GIRLS' HIGH SCHOOL – Girls Boarding
23. ST TERESA'S GIRLS SECONDARY SCHOOL – Girls Day
24. NDURURUNO SECONDARY SCHOOL – Mixed Day
25. MURANG'A ROAD MIXED DAY SECONDARY SCHOOL – Mixed Day
26. PUMWANI GIRLS SECONDARY SCHOOL – Girls Day
27. LANG'ATA HIGH SCHOOL – Mixed Day
28. KAREN ' C ' SECONDARY SCHOOL. – Mixed Day
31. DAGORETTI HIGH SCHOOL – Boys Boarding
32. UPPER HILL SCHOOL – Boys Boarding
33. MOI GIRLS' SCHOOL NAIROBI – Girls Boarding
34. PRECIOUS BLOOD RIRUTA – Girls Boarding
35. MUTUINI HIGH SCHOOL – Boys Day
36. RUTHIMITU SECONDARY SCHOOL – Mixed Day
37. NEMBU GIRLS HIGH SCHOOL – Girls Boarding
38. RUTHIMITU GIRLS SEC SCHOOL – Girls Day
39. DAGORETTI MIXED SEC SCHOOL – Mixed Day
40. PARKLANDS ARYA GIRLS HIGH SCHOOL – Girls Boarding
41. STATEHOUSE GIRLS H. SCH – Girls Boarding
42. KANGEMI HIGH SCHOOL – Boys Boarding
43. HOSPITAL HILL HIGH SCHOOL – Mixed Boarding
44. ST. GEORGE'S GIRLS' SECONDARY SCHOOL – Girls Boarding
45. NAIROBI MILIMANI SECONDARY SCHOOL – Boys Day
46. LAVINGTON MIXED SECONDARY SCHOOL – Mixed Boarding
47. HIGHRIDGE MIXED SECONDARY SCHOOL – Mixed Boarding
48. KAHAWA GARRISON SECONDARY SCHOOL – Mixed Day
49. KAMITI SECONDARY SCHOOL – Mixed Day
50. KAYOLE SECONDERY SCHOOL – Mixed Day
51. EMBAKASI GIRLS SECONDARY SCHOOL – Girls Boarding
52. PETER KIBUKOSYA SECONDARY SCHOOL – Mixed Day
53. KAYOLE SOUTH SECONDARY SCHOOL – Mixed Day
54. DANDORA SECONDARY SCHOOL – Mixed Day
55. MUHURI MUCHIRI BOYS HIGH SCHOOL – Boys Boarding
56. HON. DR. MWENJE SECONDARY SCHOOL – Mixed Day
57. USHIRIKA SECONDARY SCHOOL –

29. OLYMPIC HIGH SCHOOL – Mixed Day 30. RAILA EDUCATIONAL CENTRE – Mixed Day	Mixed Day 58. JEHOVA JIRE SECONDARY SCHOOL – Mixed Boarding 59. DRUMVALE SECONDARY SCHOOL – Mixed Boarding 60. GEORGE ATHI SECONDARY SCHOOL – Mixed Boarding

Private secondary schools in Nairobi:

1. Aga Khan High School, Nairobi	1. Malezi High School
2. Al Maktoum Foundation	2. Marion Group of Schools
3. Apostolic Carmel Secondary Sch.	3. Mugumo-Ini Girls Secondary School
4. Authentic Academy	4. Munadhamat Al Dawa Al Islamia
5. Batian Christian School	5. Mwiki Mixed Secondary School
6. Bright Star High School	6. Nairobi Muslim Academy
7. Brookfield Secondary School	7. NPC Academy, Buru Buru
8. Brookshine School, Nairobi	8. Nairobi Queens Educational Centre
9. Brucewood Education Centre	9. Ngei P.A.G Secondary School
10. C.G.H.U. Girls Secondary School	10. Pan African High School
11. Charity Student Centre Nairobi	11. Premier Academy
12. Consolata School	12. Prince Johns Mixed Day & Boarding Sch
13. Corner Brook School	13. Queen of Apostles Seminary
14. Cresent Girls Secondary	14. Racecourse Education Complex Kayole
15. Dawnstar Educational Centre-Nairobi	15. Rasul Al Akram Academy
16. Domus Mariae School	16. Redeemed Education Centre
17. Don Bosco Boys Town School	17. Riara Group of Schools
18. Don Bosco Secondary School	18. Riara Springs Girls High School
19. E.M.F Excellent Education Centre	19. Riruta Central Secondary School
20. Elgonridge Schools Ltd (Allumini Academy)	20. Riverside Academy
21. Embakasi High School	21. Sharda High School
22. Enna School	22. Shauri Moyo M.H. Secondary Sch
23. Exeter Academic Complex	23. Shilce Secondary School
24. Fedha School	24. Silver Brige School
25. Forest View Academy	25. SSD Secondary School
26. Gateway High School	26. St. Bernard Secondary School
27. Gladys Girls High School	27. St. Christopher School
28. Global Vision Secondary School	28. St. Deborah School
29. Good Samaritan High School	29. St. Dominic Savio's Secondary School
30. Good Shepherd High School	30. St. Edward's High School
31. Guru Nanak (GN) Academy	31. St. Elizabeth Secondary School
32. Guru Nanak (GN) Secondary School	32. St. Florence Girls Secondary School
33. High Link Secondary School	33. St. Hannah's Boy's School
34. Imprezza Secondary School	34. St. Hannah's Girls School
35. Jucky Secondary School	35. St. Hannah's Schools
36. Kahawa Secondary School	36. St. John's High School
37. Kangundo Complex School Karengata Academy	37. St. Juliet Preparatory
38. Karen South School	38. St. Lucie Kiriri Girls Secondary School
39. Kariobangi South Secondary School	39. St. Lukes Sec. School, Sigona
40. Karura S.D.A. Secondary School	40. St. Martin's School
41. Kayole Girls High School	41. St. Mary's Academy
42. Kenya Muslim Academy	42. St. Mary's Ruaraka School
43. Khalsa Girls Secondary School	43. St. Mary's School
44. Kimana Central Academy	44. St. Tito High School
45. Kingsize Academy	45. Stanmore High School
	46. Star Shake Academy
	47. Strathmore School

46. Kitisuru High School 47. Le Pic Senior School 48. Le Pic Senior School 49. Light Academy 50. Lili Vision High School 51. Loreto Convent, Msongari 52. Loreto Convent, Valley Road 53. Makina High School	48. Sunflower Secondary School 49. Sunshine Secondary School 50. Talanta Preparatory School 51. Temple Road High School 52. Wakulima Secondary School 53. Welkim Senior Academy 54. Wamy High School

(Source www.softkenya.com)

APPENDIX V: List of primary schools in Nairobi county

NAIROBI CITY COUNTY: EDUCATION DEPARTMENT DATA ON NAIROBI PUBLIC ECD CENTRES & PRIMARY SCHOOLS AND LOCATIONS

S/NO.	NAME OF SCHOOL	DISTRICT	ZONE	LOCATION
1	MBAGATHI ROAD PRIMARY	DAGORETTI	RIRUTA	KEMRI ROAD OFF MBAGATHI RD
2	NEMBU PRIMARY	DAGORETTI	RIRUTA	MUTHAMA - KIKUYU RD
3	KAWANGWARE PRIMARY	DAGORETTI	RIRUTA	KAWANGWARE NEAR CHIEFS OFFICE
4	TOI PRIMARY	DAGORETTI	RIRUTA	JOSEPH KANGETHE RD. NEAR WINNERS CHAPEL
5	RIRUTA HGM PRIMARY	DAGORETTI	RIRUTA	NAIVASHA RD. AFTER PRECIOUS BLOOD RIRUTA
6	DAGORETTI MUSLIM PRIMARY	DAGORETTI	RIRUTA	DAGORETTI MUSLIM - MUTHIORA ROAD.
7	KINYANJUI ROAD PRIMARY	DAGORETTI	RIRUTA	RIRUTA SATELLITE - KINYANJUI ROAD
8	JOSEPH KANGETHE PRIMARY	DAGORETTI	RIRUTA	WOODLEY - BEFORE JOSEPH KANGETHE RD.
9	JAMHURI PRIMARY	DAGORETTI	RIRUTA	NGONG ROAD. NEXT TO UNIVERSITY OF NAIROBI KENYA SCIENCE CAMPUS
10	GATINA PRIMARY	DAGORETTI	RIRUTA	KAWANGWARE GATINA
11	MUTUINI PRIMARY	DAGORETTI	WAITHAKA	DAGORETTI MARKET ALONG MUCHUGIA RD
12	MUKARARA	DAGORETTI	WAITHAKA	WAITHAKA NEAR MUKARARA PCEA CHURCH
13	DAGORETTI GIRLS REHABILITATION	DAGORETTI	WAITHAKA	ON BOUNDARY OF KIAMBU WEST & DAGORETTI DISTRICT AFTER MUHURI ROAD FORMER ROUTE 87
14	DAGORETTI SPECIAL SCHOOL	DAGORETTI	WAITHAKA	DAGORETTI CHILDREN CENTRE INSIDE THE FEED THE CHILDREN DAGORETTI MARKET
15	KAGIRA PRIMARY	DAGORETTI	WAITHAKA	WAITHAKA AFTER RUTHIMITU PRIMARY SCHOOL
16	KIRIGU PRIMARY	DAGORETTI	WAITHAKA	DAGORETI - MUTUINI
17	RUTHIMITU PRIMARY	DAGORETTI	WAITHAKA	RUTHIMITU
18	WAITHAKA SPECIAL SCHOOL	DAGORETTI	WAITHAKA	MUTUINI - NEAR KIRIGU PRIMARY
19	DR. MUTHIORA PRIMARY	DAGORETTI	WAITHAKA	MUTUINI
20	GITIBA PRIMARY	DAGORETTI	WAITHAKA	DAGORETTI MARKET BEFORE ST. JOSEPH CTHOLIC CHURCH
21	RIRUTA SATELLITE PRIMARY	DAGORETTI	RIRUTA	RIRUTA SATELLITE
22	KABIRIA PRIMARY SCHOOL	DAGORETTI	RIRUTA	OFF KABIRIA ROAD, WAITHAKA LOCATION
23	SHADRACK KIMALEL PRIMARY SCHOOL	DAGORETTI	RIRUTA	KENYATTA GOLF COURSE NGUMMO LAINI SABA
24	NDURARUA PRIMARY	DAGORETTI	RIRUTA	RIRUTA, NDURARUA GROUNDS ON KINYANJUI ROAD
25	UPPER HILL DAY NURSERY	DAGORETTI	RIRUTA	UPPER HILL AREA ALONG ELGON ROAD
26	UMOJA PRIMARY	EMBAKASI	DANDORA	UMOJA ESTATE PHASE I ALONG MOI DRIVE ROAD
27	RONALD NGALA PRIMARY	EMBAKASI	DANDORA	DANDORA PHASE IV/V
28	USHIRIKA PRIMARY	EMBAKASI	DANDORA	DANDORA PHASE V - NEXT TO RONALD NGALA PRIMARY
29	KARIOBANGI SOUTH PRIMARY	EMBAKASI	DANDORA	KARIOBANGI SOUTH ALONG MUTARAKWA ROAD
30	TOM MBOYA PRIMARY	EMBAKASI	DANDORA	DANDORA
31	GITUAMBA PRIMARY	EMBAKASI	DANDORA	RUAI SEWAGE
32	PETER KIBUKOSYA PRIMARY	EMBAKASI	DANDORA	UMOJA II ESTATE - SITE STAGE
33	ATHI PRIMARY	EMBAKASI	DANDORA	5KM FROM MAIN KANGUNDO RD. IN NGUNDU/ATHI ZONE
34	RUAI PRIMARY	EMBAKASI	DANDORA	ALONG KANGUNDO RD. AT RUAI SHOPPING CENTRE
35	JEHOVAH JIREH PRIMARY	EMBAKASI	DANDORA	MAILI SABA
36	NGUNDU PRIMARY	EMBAKASI	DANDORA	KAMULU - NGUNDU ALONG KANGUNDO RD.
37	UNITY PRIMARY	EMBAKASI	KAYOLE	UMOJA INNERCORE
38	UTAWALA ACADEMY	EMBAKASI	KAYOLE	WITHIN ADMINISTRATION POLICE TRAINING COLLEGE - EMBAKASI
39	KAYOLE I PRIMARY	EMBAKASI	KAYOLE	KAYOLE OFF KANGUNDO ROAD
40	TUMAINI PRIMARY	EMBAKASI	KAYOLE	UMOJA II OFF MOI DRIVE
41	OUR LADY OF NAZARETH PRIMARY	EMBAKASI	KAYOLE	MUKURU KWA NJENGA
42	MAUA PRIMARY	EMBAKASI	KAYOLE	KANGUNDO ROAD - NJIRU COKAA BURUBURU FARM
43	VISIONS PRIMARY (MIHANG'O)	EMBAKASI	KAYOLE	MIHANG'O LOCATION
44	EMBAKASI GARRISON PRIMARY	EMBAKASI	KAYOLE	EMBAKASI GARRISON BARRACKS COMPUND ALONG TO UTAWALA
45	MWANGAZA PRIMARY	EMBAKASI	KAYOLE	KAYOLE
46	EMBAKASI PRIMARY	EMBAKASI	KAYOLE	EMBAKASI VILLAGE
47	THAWABU PRIMARY	EMBAKASI	KAYOLE	KAYOLE
48	BONDENI PRIMARY	EMBAKASI	KAYOLE	KAYOLE SOUTH NEXT TO KAYOLE CATHOLIC CHURCH - (DIVEN WORD PARISH)
49	KOMAROCK PRIMARY	EMBAKASI	KAYOLE	KOMAROCK ESTATE OOF SPINE ROAD
50	KIFARU PRIMARY	EMBAKASI	KAYOLE	UMOJA II - MOI DRIVE
51	EDELVALE PRIMARY	EMBAKASI	KAYOLE	DOONHOLM PHASE V AT JACARANDA ESTATE ROUND ABOUT - TAKE THE EARTH ROAD
52	IMARA PRIMARY	EMBAKASI	KAYOLE	KAYOLE SOWETO RD. OPP. KAYOLE CHIEF'S OFFICE - MUGENDI STAGE
53	DOONHOLM PRIMARY	EMBAKASI	KAYOLE	DOONHOLM ESTATE NXT. TO RIKINA SUPERMARKETS
54	BUSARA PRIMARY	EMBAKASI	DANDORA	UMOJA ESTATE - MOI DRIVE ROAD
55	A.E.F. REUBEN PRIMARY	EMBAKASI	KAYOLE	OFF INTERPRISE AFTER HILL-LOCKS HOTEL IN REUBEN SLUMS
56	KWA NJENGA PRIMARY	EMBAKASI	KAYOLE	KWA NJENGA WARD OFF AIRPORT ROAD AT A.A. OF KENYA HEADQUARTERS
57	DANDORA PRIMARY SCHOOL	EMBAKASI	DANDORA	DANDORA PHASE ONE, ALONG KOMAROCK RD. OPP. SENIORS SCH, ADJACENT TO TOTAL PETROL STATION
58	SIMBA DAY NURSERY	EMBAKASI	KAYOLE	UMOJA
59	MUGUMO DAY NURSERY	EMBAKASI	KAYOLE	NEAR PETER KIBUKOSYA PRIMARY SCHOOL
60	MWANGAZA DAY NURSERY	EMBAKASI	KAYOLE	NEAR PETER KIBUKOSYA PRIMARY SCHOOL
61	UNITY DAY NURSERY	EMBAKASI	KAYOLE	UMOJA INNERCORE
62	UMOJA I DAY NURSERY	EMBAKASI	DANDORA	IN UMOJA NEXT TO DIVISON OFFICE UMOJA I ESATE
63	ST. DOMINIC'S PRIMARY SCHOOL	EMBAKASI	DANDORA	MWIKI
64	KAYOLE NORTH PRIMARY	EMBAKASI	DANDORA	KAYOLE NORTH (MATOPENI) AREA NEAR KAYOLE POLICE STATION
65	KANGUNDO ROAD PRY	EMBAKASI	DANDORA	OPPOSITE MAMA LUCY KIBAKI HOSPITAL
66	JAMES GICHURU PRIMARY	EMBAKASI	DANDORA	DANDORA PHASE II
67	WANGU PRIMARY	EMBAKASI	DANDORA	DANDORA PHASE II OPPOSITE CO-OPERATIVE BANK ON MUIGAI KENYATTA ROAD
68	DRUMVALE PRIMARY	EMBAKASI	DANDORA	KAMULU OFF KANGUNDO ROAD, SIR HENRY'S DRIVE - PEARL STREET(Drumvale)
69	NJIRU PRIMARY	EMBAKASI	DANDORA	ON YOUR WAY TO MWIKI BETWEEN NJIRU CHIEF'S CAMP / D.Os OFFICE AND QUARRY
70	EASTLEIGH AIRPORT PRIMARY	KAMUKUNJI	EASTLEIGH	2ND AVENUE OFF 3RD ST. NEXT TO MAINA WANJIGI SECONDARY
71	MUTHURWA PRIMARY	KAMUKUNJI	BAHATI	ALONG SAKWA RD. NEXT TO KMC
72	UHURU ESTATE PRIMARY	KAMUKUNJI	BAHATI	UHURU ESTATE ON UHURU RD. NEXT TO UHURU SECONDARY
73	HESHIMA ROAD PRIMARY	KAMUKUNJI	BAHATI	AMBIRA ROAD - MAKONGENI
74	OUR LADY OF MERCY GIRLS - SHAURI MO	KAMUKUNJI	BAHATI	AMBIRA RD. OFF JOGOO ROAD
75	BAHATI UHURU PRIMARY	KAMUKUNJI	BAHATI	HESHIMA AVENUE ZEMBAKASI CRESENT, ZEMBAKASI LANE
76	KIMATHI PRIMARY	KAMUKUNJI	BAHATI	KIMATHI ESTATE
77	MORRISON PRIMARY	KAMUKUNJI	BAHATI	BAHATI
78	DR. LIVINGSTONE PRIMARY	KAMUKUNJI	BAHATI	JERUSALEM ESTATE
79	NAIROBI RIVER PRIMARY	KAMUKUNJI	BAHATI	OUTERING RD. ESTATE OFF MUMIA SOUTH RD.
80	NEW EASTLEIGH PRIMARY	KAMUKUNJI	EASTLEIGH	EASTLEIGH NORTH
81	ZAWADI PRIMARY	KAMUKUNJI	EASTLEIGH	EASTLEIGH SECTION 3 NEAR EASTMAT No. 4 BUS STAGE
82	MOI AIR BASE PRIMARY	KAMUKUNJI	EASTLEIGH	KENYA AIR FORCE EASTLEIGH - NAIROBI
83	MOI FORCES ACADEMY	KAMUKUNJI	EASTLEIGH	NEXT TO MOI AIR BASE - JUJA ROAD
84	ST. TERESA'S BOYS PRIMARY SCHOOL	KAMUKUNJI	EASTLEIGH	EASTLEIGH SECTION I WITHIN THE CATHOLIC CHURCH NEAR MLANGO KUBWA
85	BAHATI DAY NURSERY	KAMUKUNJI	BAHATI	AT BAHATI SHOPPING CENTRE NEXT TO UHURU BAHATI PRIMARY SCHOOL
86	NEW PUMWANI PRIMARY	KAMUKUNJI	EASTLEIGH	FROM RING ROAD NGARA CONNECT TO KINYANJUI ROAD - SCHOOL IS BEFORE THE KARIOKOR WWII COMMONWEALTH CEMETARY
87	BURUBURU I PRIMARY	KAMUKUNJI	BAHATI	BURUBURU PHASE I OFF MUMIAS ROAD NEXT TO ORANGE HOUSE
88	ROYSAMBU PRIMARY	KASARANI	KAHAWA	ZIMMERMAN

89	KAHAWA PRIMARY	KASARANI	KAHAWA	KAHAWA WEST NEXT TO FARMERS CHOICE FACTORY
90	KAMITI PRIMARY	KASARANI	KAHAWA	INSIDE KAMITI PRISONS
91	KAWAHA GARRISON PRIMARY	KASARANI	KAHAWA	KAHAWA BARRACKS ALONG THIKA RD.
92	GITHURAI PRIMARY	KASARANI	KAHAWA	GITHURAI 45 ROUND ABOUT NEXT TO CCN STONE MARKET
93	GARDEN ESTATE PRIMARY	KASARANI	KAHAWA	OFF THIKA RD. ON YOUR WAY TO WIDSOR
94	KENYATTA UNIVERSITY PRIMARY	KASARANI	KAHAWA	INSIDE KENYATTA UNIVERSITY GROUNDS
95	MAHIGA PRIMARY	KASARANI	KAHAWA	OPP. KAMITI PRISON BOUNDARY ON ENTRY TO KAHAWA WEST SHOPPING CENTRE
96	KIWANJA PRIMARY	KASARANI	KAHAWA	NEXT TO KENYATTA UNIVERSITY NYAYO HOSTELS ON KIWANJA RD. OFF KAHAWA RD. AFTER FARMAERS CHOICE
97	MARARUI PRIMARY	KASARANI	KAHAWA	AT MARARUI VILLAGE NEXT TO THOME ESTATE OFF THIKA ROAD
98	NJATHAINI PRIMARY	KASARANI	KAHAWA	NGOMONGO OPP. POLICE STATION OFF KAMITI ROAD
99	NGUNYUMU PRIMARY	KASARANI	RUARAKA	KOROGOCHO SLUMS-NGOMONGO
100	MATHARE 4A PRIMARY	KASARANI	RUARAKA	MATHARE 4A VILLAGE
101	THIKA ROAD PRIMARY	KASARANI	RUARAKA	BETWEEN N.Y.S. & KENYA COLLEGE OFF THIKA RD.
102	G.S.U. PRIMARY	KASARANI	RUARAKA	G.S.U. HEAD QUARTERS RUARAKA CAMP THIKA RD.
103	DANIEL COMBONI PRIMARY	KASARANI	RUARAKA	KOROGOCHO
104	MUTHAIGA PRIMARY	KASARANI	RUARAKA	THIKA ROAD OPP. MATHARI HOSPITAL
105	MARURA PRIMARY	KASARANI	RUARAKA	KARIOBANGI NORTH NEAR THE KARIOBANGI MARKET
106	M.M. CHANDARIA PRIMARY	KASARANI	RUARAKA	BABA DOGO
107	KASARANI PRIMARY	KASARANI	KAHAWA	KASARANI MWIKI RD. OPP. WARREN ENTERPRISES LTD.
108	KARIOBANGI NORTH PRIMARY	KASARANI	RUARAKA	KARIOBANGI NORTH NEAR CITY COUNCIL MARKET
109	MUREMA PRIMARY	KASARANI	KAHAWA	KASARANI - HUNTERS
110	MATHARE NORTH PRIMARY SCHOOL	KASARANI	RUARAKA	MATHARE NORTH AREA II
111	BABA DOGO PRIMARY SCHOOL	KASARANI	RUARAKA	ALONG BABA DOGO ROAD, NEXT TO M.M. CHANDARIA PRY, OPPOSITE PREMIER FOOD INDUSTRIES
112	DRIVE-IN PRIMARY SCHOOL	KASARANI	RUARAKA	MATHARE NORTH NEAR RUARAKA HIGH SCHOOL
113	TREESIDE SPECIAL SCHOOL	KASARANI	KAHAWA	MWIKI ON YOUR WAY TO STADIA HOTEL
114	KAREN 'C' PRIMARY	LANG'ATA	KAREN	ALONG LANGATA RD.
115	NGONG FOREST PRIMARY	LANG'ATA	KAREN	NGONG ROAD WITHIN NGONG FOREST OPP. LENANA SCHOOL
116	ST. MARY'S KAREN PRIMARY	LANG'ATA	KAREN	KAREN SHOPPING CENTRE ALONG LANGATA RD.
117	AYANY PRIMARY	LANG'ATA	KAREN	SARANG'OMBE WARD
118	LANGATA ROAD PRIMARY	LANG'ATA	NAIROBI WEST	ALONG LANGATA RD.
119	RAILA EDUCATION CENTRE	LANG'ATA	KAREN	KISUMU NDOGO AREA ALONG RAILWAY LINE NEXT TO RAILA EDUCATIONAL CENTER
120	NGEI PRIMARY	LANG'ATA	NAIROBI WEST	KITENGELA RD. MUGUMU
121	KONGONI PRIMARY	LANG'ATA	NAIROBI WEST	SOUTH 'C'
122	LANGATA WEST PRIMARY	LANG'ATA	NAIROBI WEST	OTIENDE SHOPPING CENTRE NEXT TO LANGATA HEALTH CENTRE
123	UHURU GARDENS PRIMARY	LANG'ATA	NAIROBI WEST	LANGATA RD. OFF KITENGELA ROAD
124	MADARAKA PRIMARY SCHOOL	LANG'ATA	NAIROBI WEST	IN MADARAKA ESTATE
125	OLYMPIC PRIMARY	LANG'ATA	KAREN	KIBERA SLUMS, SARANG'OMBE NEXT TO RAILWAY LINE
126	LANGATA BARRACKS PRIMARY	LANG'ATA	NAIROBI WEST	INSIDE THE LANGATA BARRACKS MILLATRY CAMP
127	KIBERA PRIMARY	LANG'ATA	KAREN	KIBERA DRIVE - KARANJA ROAD
128	NAIROBI WEST DAY NUSERY	LANG'ATA	NAIROBI WEST	NAIROBI WEST SHOPPING CENTRE NEXT TO UCHUMI SUPERMARKET - SOUTH 'B'
129	RABAI ROAD PRIMARY	MAKADARA	BURUBURU	RABAI RD. OPP. METROPOLITAN HOSPITAL JERICHO MARKET
130	BARAKA PRIMARY	MAKADARA	BURUBURU	BTW. BURUBURU PHASE V & III MUMIAS RD. NEAR BLESSED SACRAMENT CATHOLIC CHURCH
131	HARAMBEE PRIMARY	MAKADARA	BURUBURU	HARAMBEE ESTATE MUMBI RD. OFF RABAI ROAD
132	OFAFA JERICHO PRIMARY	MAKADARA	BURUBURU	JERICHO ESTATE
133	ST. MICHAEL'S PRIMARY	MAKADARA	BURUBURU	ALONG NILE ROAD OFF JOGOO RD.
134	ST. ANNE'S PRIMARY	MAKADARA	BURUBURU	NEXT TO GOVERNMENT QUARTERS JOGOO RD.
135	DR. KRAPF PRIMARY	MAKADARA	BURUBURU	MARINGO OFAFA ESTATE RUAKA STREET
136	JOGOO ROAD PRIMARY	MAKADARA	BURUBURU	MAKADARA ALONG JOGOO ROAD

137	ST. PAUL'S PRIMARY	MAKADARA	BURUBURU	MBOTELA ESTATE
138	MARTIN LUTHER PRIMARY	MAKADARA	BURUBURU	MAKADARA HAMZA
139	MARIAKANI PRIMARY	MAKADARA	VIWANDA	MARIAKANI ESTATE SOUTH 'B'
140	STAR OF HOPE LUNGA LUNGA	MAKADARA	VIWANDA	LUNGA LUNGA
141	JOSEPH APUDO PRIMARY	MAKADARA	VIWANDA	MAKONGENI RAILWAY QUARTERS
142	MAKONGENI PRIMARY	MAKADARA	VIWANDA	ALONG JOGOO RD. WITHIN MAKONGENI RAILWAY QUARTERS
143	OUR LADY OF MERCY SOUTH 'B'	MAKADARA	VIWANDA	SOUTH 'B' NEAR QUEEN OF PEACE CHURCH
144	PLAINSVIEW PRIMARY	MAKADARA	VIWANDA	SOUTH 'B'
145	ST. ELIZABETH LUNGA LUNGA	MAKADARA	VIWANDA	ALONG LUNGA LUNGA RD. NEAR MAREBA COMPANY IN LUNGA LUNGA SLUM
146	ST. BAKHITA PRIMARY	MAKADARA	VIWANDA	INDUSTRIAL AREA - OPP. EXPRESS
147	MUKURU PRIMARY	MAKADARA	VIWANDA	INDUSTRIAL AREA - KAYABA VILLAGE
148	NAIROBI SOUTH PRIMARY	MAKADARA	VIWANDA	SOUTH 'B' OPP. MARIAKANI COTTAGE NEXT TO O.L.M. PRIMARY SCHOOL
149	NILE ROAD SPECIAL SCHOOL	MAKADARA	BURUBURU	MARINGO ESTATE ALONG NILE RD - ON JOGOO ROAD
150	ST. JOHN'S PRIMARY	MAKADARA	VIWANDA	ALONG JOGOO RD. MAZIWA STAGE OPP. KOBIL PETROLS STATION OFF KILIMA MBOGO STREET
151	BIDII PRIMARY	MAKADARA	BURUBURU	BURUBURU SHOPPING CENTRE ALONG MUMIAS ROAD
152	KALOLENI PRIMARY	MAKADARA	VIWANDA	KALOLENI ESTATE
153	ST. PATRICK'S PRIMARY SCHOOL	MAKADARA	BURUBURU	MARINGO ESTATE 200m EAST OF MAKADARA D.Cs OFFICE
154	TANA DAY NURSERY	MAKADARA	BURUBURU	JERICHO - LUMUMBA
155	NJORO CLOSE DAY NURSERY SCHOOL	MAKADARA	BURUBURU	JERICHO
156	OFAFA DAY NURSERY	MAKADARA	BURUBURU	MARINGO
157	KALOLENI DAY NURSERY	MAKADARA	VIWANDA	KALOLENI ESTATE - JOGOO ROAD
158	MBOTELA DAY NURSERY	MAKADARA	BURUBURU	MBOTELA ESTATE- BEHIND THE HALL, FROM JOGOO ROAD
159	ST. CATHERINE'S PRIMARY	MAKADARA	VIWANDA	ON DUNGA ROAD NEAR KENYA INSTITUTE OF MASS COMMUNICATION
160	CANON APOLO PRIMARY	MAKADARA	BURUBURU	ON DUNGA ROAD OPPOSITE MATER HOSPITAL
161	RIVER BANK PRIMARY	STAREHE	CENTRAL	GAUTAMA RAMESH RD. IN NGARA OFF. MURANG'A RD. BTW. NGARA SECONDARY AND MURANG'A RD. PRY.
162	PUMWANI PRIMARY	STAREHE	CENTRAL	PUMWANI NEAR MUSLIM PRY. & PUMWANI BOYS HIGH
163	S.S.D. PRIMARY	STAREHE	CENTRAL	CITY CENTRE
164	MURANG'A ROAD PRIMARY	STAREHE	CENTRAL	MURANG'A RD
165	PARKLANDS PRIMARY	STAREHE	CENTRAL	BTW. FOREST RD. & KOLOBOT RD. NEAR STIMA PLAZA
166	DR. AGGREY PRIMARY	STAREHE	CENTRAL	GENERAL WAURINGE
167	MATHARI PRIMARY	STAREHE	CENTRAL	MATHARI MENTAL HOSPITAL
168	NDURURUNO PRIMARY	STAREHE	JUJA ROAD	HURUMA KIAMAIKO WARD
169	AINSWOTH STREET PRIMARY	STAREHE	JUJA ROAD	EASTLEIGH OFF MURATINA ROAD
170	ARYA PRIMARY	STAREHE	JUJA ROAD	MURANG'A RD OFF TAITA RD NEAR GLORY PALACE HOTEL NGARA
171	KIBORO PRIMARY	STAREHE	JUJA ROAD	ALONG JUJA ROAD
172	NG'ETHU WATER WORKS	STAREHE	JUJA ROAD	NGETHU TREATMENT PLANT
173	RACECOURSE PRIMARY	STAREHE	JUJA ROAD	PANGANI ESTATE - ATHUMANI ROAD
174	VALLEY BRIDGE PRIMARY	STAREHE	JUJA ROAD	KIAMAIKO NEXT TO SUNFLOWER ACADEMY ALONG OUTERING ROAD
175	SALAMA PRIMARY	STAREHE	JUJA ROAD	BEHIND HURUMA FLATS ON HURUMA SERVICE ROAD
176	MUSLIM PRIMARY	STAREHE	JUJA ROAD	PUMWANI AREA
177	ST. TERESA'S GIRLS PRIMARY	STAREHE	JUJA ROAD	ALONG JUJA ROAD OPP. ST. TERESA'S CHURCH
178	ISLAMIA PRIMARY	STAREHE	CENTRAL	PUMWANI ROAD OPP. KAMUKUNJI POLICE STATION
179	ST. BRIGIDS PRIMARY	STAREHE	CENTRAL	ALONG GEN. WARUINGE RD. NEXT TO STAREHE BOYS CENTRE
180	PANGANI PRIMARY	STAREHE	JUJA ROAD	KARIOKOR - NEAR PUMWANI BOYS SEC. SCHOOL
181	HURUMA PRIMARY	STAREHE	JUJA ROAD	HURUMA ESTATE OFF JUJA ROAD BEHIND HURUMA FLATS
182	MOI AVENUE PRIMARY	STAREHE	CENTRAL	TOWN CENTRE -MOI AVENUE
183	ST. PETER CLAVERS PRIMARY	STAREHE	CENTRAL	ALONG RACECOURSE ROAD NAIROBI
184	CITY PRIMARY	STAREHE	JUJA ROAD	MURANG'A ROAD-LIMURU ROAD JUNCTION, NGARA

185	PARK ROAD PRIMARY	STAREHE	JUJA ROAD	RACECOURSE ROAD - 100M FROM PANGANI POLICE STATION
186	C.G.H.U. PRIMARY	STAREHE	CENTRAL	TOWN CENTRE - RONALD NGALA STREET AND VYOMA STREET
187	JUJA ROAD PRIMARY	STAREHE	JUJA ROAD	PANGANI - HOMBE ROAD
188	PUMWANI PRIMARY SCHOOL	STAREHE	CENTRAL	PUMWANI
189	CENTRAL DAY CURSERY	STAREHE	CENTRAL	CITY CENTRE NEAR CASINO CLINIC, NDUBERI LANE
190	PARKLANDS DAY NURSERY	STAREHE	CENTRAL	PARKLANDS ALONG FOREST ROAD
191	NGARA EAST DAY NURSERY	STAREHE	CENTRAL	PARKROAD BETWEEN NGARA HEALTH CLINIC AND RAILWAY QUARTERS
192	STAREHE DAY NURSERY	STAREHE	JUJA ROAD	KARIOKOR MARKET TO GIKOMBA MARKET- KINYANJUI ROAD
193	ZIWANI DAY NURSERY	STAREHE	ZIWANI	ZIWANI ESTATE OPPOSITE ZIWANI WARD OFFICE
194	DAIMA PRIMARY	STAREHE	JUJA ROAD	NEAR KENYA ASSEMBLY OF GOD CHURCH HURUMA ALONG JUJA ROAD
195	MATHARE TECHNICAL SPECIAL	STAREHE	JUJA ROAD	ALONG JUJA ROAD AFTER EASTLEIGH SECOND AVENUE BEFORE REACHINF THE WATER KIOSK
196	KABETE VET LAB PRIMARY	WESTLANDS	KILIMANI	UTHIRU NEXT TO KABETE POLICE STATION OPP. ST. JOSEPH ACK CHURCH
197	KIHUMBUINI PRIMARY	WESTLANDS	KILIMANI	KANGEMI
198	NAIROBI PRIMARY	WESTLANDS	KILIMANI	MAMLAKA OFF NYERERE RD.
199	MILIMANI PRIMARY	WESTLANDS	KILIMANI	KILIMANI ON KIRICHWA ROAD
200	LAVINGTON PRIMARY SCHOOL	WESTLANDS	KILIMANI	LAVINGTON MUGUMO ROAD
201	STATE HOUSE PRIMARY	WESTLANDS	KILIMANI	KILIMANI AREA ABORETUM ROAD
202	KILELESHWA PRIMARY	WESTLANDS	KILIMANI	ALONG MANDERA RD. NEXT TO KILELESHWA POLICE STATION GICHURU RD.
203	MUTHANGARI PRIMARY	WESTLANDS	KILIMANI	JAMES GICHURU RD. MBAMBANE RD LAVINGTON
204	NEW KIHUMBUINI PRIMARY	WESTLANDS	KILIMANI	KANGEMI SHOPPING CENTRE ALONG WAIYAKI WAY
205	KILIMANI PRIMARY	WESTLANDS	KILIMANI	KILIMANI - ARKWING KHODEK ROAD
206	AGA KHAN PRIMARY	WESTLANDS	PARKLANDS	5TH PARKLANDS ALONG LIMURU RD. OPP. CITY PARK HAWKERS MKT
207	FARASI LANE PRIMARY	WESTLANDS	PARKLANDS	ALONG LOWER KABETE ROAD
208	VISA OSHWAL PRIMARY - NAIROBI	WESTLANDS	PARKLANDS	WESTLANDS MPAKA ROAD
209	BOHRA PRIMARY SCHOOL	WESTLANDS	PARKLANDS	WESTLANDS BROOKESIDE DRIVE
210	KABETE REHABILITATION SCHOOL	WESTLANDS	PARKLANDS	LOWER KABETE RD. 1KM IMMEDIATELY AFTER LOWER KABETE CAMPUS FROM TOWN / OR ON LOWER KABETE ROAD 200 METRES AFTER K.I.A. FROM NAIROBI TOWARDS WANGIGE
211	HOSPITAL HILL PRIMARY	WESTLANDS	PARKLANDS	PARKLANDS ROAD
212	HIGHRIDGE PRIMARY	WESTLANDS	PARKLANDS	4TH PARKLANDS AVENUE OPP. DIAMOND PLAZA
213	JACARANDA SPECIAL SCHOOL	WESTLANDS	PARKLANDS	KILELESHWA - KISII RD. OFF SIAYA RD. OFF OTHAYA RD NEXT TO KENTON COLLEGE
214	NORTH HIGHRIDGE PRIMARY	WESTLANDS	PARKLANDS	6TH PARKLANDS NEAR KESI COLLEGE
215	MUGUGA GREEN PRIMARY	WESTLANDS	PARKLANDS	WAIYAKI WAY
216	WESTLANDS PRIMARY	WESTLANDS	PARKLANDS	WESTLANDS - SCHOOL LANE NEAR SARIT CENTRE
217	KARURA FOREST PRIMARY	WESTLANDS	PARKLANDS	KARURUA FOREST HEAD OFFICES - KIAMBU ROAD
218	CHELETA PRIMARY	WESTLANDS	PARKLANDS	RUNDA ESTATE
219	LOWER KABETE PRIMARY	WESTLANDS	PARKLANDS	LOWER KABETE RD. NEXT TO K.I.A.
220	KANGEMI PRIMARY	WESTLANDS	KILIMANI	KANGEMI, GICHAGI ALONG THIONG'O ROAD
221	ST. GEORGE'S PRIMARY	WESTLANDS	KILIMANI	DENIS PRITT ROAD AFTER STATE HOUSE
222	LORESHO PRIMARY	WESTLANDS	PARKLANDS	LORESHO RIDGE -KITSURU WARD
223	STATE HOUSE DAY NURSERY	WESTLANDS	KILIMANI	STATE HOUSE ROAD, NEXT TO STATE HOUSE PRIMARY SCHOOL
224	KILELESHWA DAY NURSERY	WESTLANDS	KILIMANI	KEILELSHWA ESTATE NEAR KILELESHWA POLICE STATION
225	LADY NORTHEY DAY NURSERY	WESTLANDS	KILIMANI	NEXT TO MILIMANI A.I.C. CHURCH ALONG STATE HOUSE ROAD

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Kenya

REF: CERTIFICATE OF FIELD WORK

This is to certify that all corrections proposed at the Board of Examiners' meeting held on ___8 | APRIL | 2015___ in respect of M.A./Ph.D final Project/Thesis defence have been effected to my/our satisfaction and the student can be allowed to proceed for field work.

Reg. No: ___KSO/69919/2013___

Name: ___NGUGI. MARTIN KABUGO___

Title: ___DEVELOPMENT COMMUNICATION IN EDUCATION:___

AN ANALYSIS OF ELEARNING IN SELECTED SCHOOLS IN NAIROBI COUNTY.
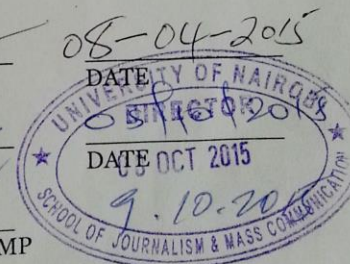
Dr Michael Mwangi
SUPERVISOR   SIGNATURE   08-04-2015
                                        DATE

Dr Samuel Sirungi
PROGRAMME COORDINATOR   SIGNATURE   DATE OCT 2015

Dr. Ndeti Ndati
DIRECTOR   SIGNATURE/STAMP   9.10.20

UNIVERSITY OF NAIROBI
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Nairobi
Kenya

OUR REF:

YOUR REF: **DATE:** September 10, 2015

TO WHOM IT MAY CONCERN

RE: NGUGI, Martin Kabugo - K50/69919/2013

This is to confirm that the above named is a bona fide student of the University of Nairobi's School of Journalism and Mass Communication registered for Master of Arts degree in Communication Studies.

Mr. Martin has completed his course work and is currently going to collect data for his research project leading to a Master of Arts Degree in Communication Studies.

Any assistance accorded to him will be highly appreciated.

Immaculate Akinyi
Administrative Assistant
School of Journalism & Mass Communication

/dm

APPENDIX VIII: UoN certificate of corrections

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Nairobi, GPO
Kenya

REF: CERTIFICATE OF CORRECTIONS

This is to certify that all corrections proposed at the Board of Examiners meeting held on __8/10/2015__ in respect of M.A/PhD. Project/Thesis Proposal defence have been effected to my/our satisfaction and the project can now be prepared for binding.

Reg. No: __K50/69919/2013__

Name: __NGUGI Martin Kabugo__

Title: __Development Communication in Education: An analysis of__
__eLearning in selected schools in Nairobi County.__

Dr Michael Mwangi
SUPERVISOR   SIGNATURE   15-10-2015 DATE

Dr Samuel Siringi
M.A. COORDINATOR   SIGNATURE   16-10-2015 DATE

Dr. Ndeti Ndeti
DIRECTOR   SIGNATURE/STAMP   16-10-2015