TECHNOLOGICAL CHALLENGES AFFECTING RADIO BROADCASTS TO SCHOOLS IN KENYA: THE CASE OF PRIMARY SCHOOLS IN RANGWE DIVISION, HOMA BAY COUNTY

BY

ERICK OMULO MUGA RIBBA

ADMIN. NO. K50/70033/2013

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER OF ARTS DEGREE IN COMMUNICATION STUDIES, SCHOOL OF JOURNALISM AND MASS COMMUNICATION, UNIVERSITY OF NAIROBI

NOVEMBER, 2015

DECLARATION

DECLARATION BY CANDIDATE

This thesis is my original work and has not been submitted in any other university for any use.

....

ERICK OMULO MUGA RIBBA DATE

(K50/70033/2013)

DECLARATION BY SUPERVISOR

This thesis has been submitted for the award of a Master of Arts Degree in Communication Studies with my approval as the university supervisor.

……..... .....

DR. JAMES ORANGA DATE

Lecturer,

School of Journalism and Mass Communication,

University of Nairobi, Kenya.

DEDICATION

I give my special thanks to God Almighty for His love and guidance in the undertaking of my Master's degree studies. I dedicate this thesis to my wife Joan Aoko Omollo, my children O'Brien Sinani Muga and Gandhi Telna Ribba, my brothers; George Otieno Ribba and Kennedy Ochieng Ribba. Their encouragements, prayers and support have made me to reach this far. I am also greatful to my mother Annah Adhiambo Ribba and my father Naman Ribba Joash in a very special way for their prayers and encouragements. May the Lord God, bless them all and continue sustaining them with His love.

ACKNOWLEDGEMENTS

My deepest appreciation goes to Dr. James Oranga who supervised this research work. His energetic and helpful pieces of advice, encouragement, and many hours he devoted to the improvement of this research paper have been greatly fruitful and life changing in the academic world. Without his effective supervision and efforts this study would have been extremely difficult.

I wish to register my appreciation too to Dr. Mary Wambaria, Mr. Kwenya Kwenya and Mr. Maranya of KICD for their guidance in the initial stages of the research and their encouraging words.

I am also grateful to Miss. Lillian Were of KICD, who formatted the copy of the proposal. Her typing skills, her great sense of responsibility and patience were simply incredible. She made me to acquire more skills in her job.

A special acknowledgement goes to my wife Joan Aoko Omollo, and my brothers George Ribba and Kennedy Ribba for their patience and moral support they provided, without which I would not have completed my studies. It was very difficult balancing family life and academics, but with the help of my wife, I waded through it up to this level. Thank you and I do appreciate.

Finally, to the learners, teachers, headteachers, Education Officers at the Homa Bay district and at Randung and Rangwe zonal levels, KICD and KBC staff members who participated in this study for their cooperation and meaningful contributions. God bless you all.

ABSTRACT

Radio broadcasts to schools programme has been in existence since 1920's. Kenya Institute of Curriculum Development (KICD) develops Interactive Radio Lessons (IRLs) with education curriculum experts and other stakeholders for learners in primary, secondary and tertiary schools including the general public, apart from the university levels (Abuli et al., 2013). In Kenya, radio broadcast to schools was introduced in 1960's with the aim of widening accessibility to education, improving quality of education, diffusing superior teaching methods to serving teachers and training of teachers at lower cost.

The research study was carried out to find out the technological challenges being faced by radio broadcasts to schools programme in Kenya, with the case of both public and private primary schools in Rangwe Division, Homa Bay County. The study used descriptive survey design. Data collection was done using semi structured questionnaires and observation schedules. The data collected from the field was coded and analyzed both qualitatively and quantitatively using descriptive statistics with the help of Statistical Professional Social Sciences (SPSS).

The overall findings showed that absolute majority of schools in Rangwe division were not using radio broadcasts to schools programme in supplementing learning in upper classes. Most headteachers and teachers including learners attributed this to lack of functional radio sets in schools, lack of electricity power connections in schools, Poor radio signal receptions in other areas, lack of sensitization in schools, lack of prompt distributions of broadcast time tables by KICD to schools, and lack of technical know-how on the operations of radio sets by teachers.

The recommendations of the findings can be used by stakeholders in education sector especially KICD in addressing the technological challenges experienced by schools in integrating radio broadcast to schools programme as a learning tool in schools. The findings also contribute to new knowledge in the field of Interactive Radio Lessons (IRLs) in schools for future research work. The stakeholders of radio broadcasts to schools programme like KICD, MOEST, KBC, TAC Tutors or AEOs, schools and other education sectors should liaise and work together to achieve the common goal of the programme which is equal education for all

.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

AEO:	Area Education Officer
CEO:	County Education Officer
DEO:	District Education Officer
EMS:	Education Media Service
FPE:	Free Primary Education
IRLs:	Interactive Radio Lessons
KBC:	Kenya Broadcasting Corporation
KICD:	Kenya Institute of Curriculum Development
KIE:	Kenya Institute of Education
KNUT:	Kenya National Union of Teachers
MES:	Media and Extension Services
MOE:	Ministry of Education
MOEST:	Ministry of Education Science and Technology
NARC:	National Alliance Rainbow Coalition
RBS:	Radio Broadcasts to Schools
SBD:	Schools Broadcast Division
TAC:	Teachers Advisory Centre
VOK:	Voice of Kenya

CHAPTER ONE

TECHNOLOGICAL CHALLENGES AFFECTING RADIO BROADCAST TO SCHOOLS IN KENYA: THE CASE OF PRIMARY SCHOOLS IN RANGWE DIVISION; AN OVERVIEW

1.1 Introduction

Chapter one is the introduction. The contextual and historical backgrounds of Radio Broadcast to Schools (RBS) are focused in this chapter. The global, regional and local contextual backgrounds are also highlighted. The chapter discusses the statement of the problem and research questions that the study sets to answer. The scope, justifications, limitations and delimitations of the study are discussed too.

1.2 Background of the Study

Radio is one of the Information Communication and Technological (ICT) tools used in mass communication. According to Bosch (2004) radio is used effectively for educational purposes through airing Interactive Radio Lessons (IRLs) to learners in schools and even the general public. It is described as one of those media that utilizes electronics for the end user to access the education content (Saettler, 2004; Kaul, 2008). Radio Broadcast to schools (RBS) provides access to quality educational teaching and learning programmes to learners across a wide range of curriculum areas. The radio lessons provide interactive, complete and ready to use sessions intended to inspire and motivate learners (Wambaria, 2003).

The study focused on technological challenges being faced by radio broadcast to schools programme in Kenya, looking at the case of primary schools in Rangwe Division, Homa Bay County. The major concern for this study therefore, was to find out whether primary schools in Rangwe division, Homa Bay County were accessing radio broadcast to schools programme as envisaged by the government through the Ministry of Education Science and Technology in its implementation (MOEST, 2005). The pertinent issues addressed were; which transmission modes were more accessible, whether the infrastructural development in Rangwe division was adequate for proper transmissions, whether educational hardware and software were available in

schools, whether the geographical location of the region was conducive for signal penetrations and whether there was technological know-how in the operations of the radio sets by the teachers.

The field of education has been affected by ICTs in general and radio in particular, which have greatly affected teaching, learning and research (Yusuf, 2005). In terms of development, ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis & Tearle, 1999; Lemke & Coughlin, 1998).

Radio broadcast to schools has been used around the globe to improve the accessibility and quality of education across a range of school subjects and to serve as a form of learner and teacher development during the Interactive radio Lessons. Interactive Radio Lessons (IRLs) delivers and stimulate interactive learning among the radio teachers and the learners. It also delivers lesson contents from approved curricula and model learner-centered teaching methods (Zuppo, 2012).

IRL was first developed in Nicaragua by a team from Stanford University in the early 1970s (Andrea Bosch, 1997). It sought to combine the low cost and high reach of radio medium with clear understanding of how people learn. Since then, many countries both in the developed and developing world have adopted the programme. In 1920 the radio division of the U.S. department of commerce began to license commercial and educational stations (Dominick, 2005). Soon schools, colleges, departments of education, and commercial stations were providing radio programming to schools. It was first started with National Broadcasting Company (NBC) having ‘Music Appreciation Hour’. ‘American School of the Air’ had very significant contributions in the start by broadcasting daily programmes on science, music, literature, history, and current events. Haaren High School in New York City is credited by being the first to air accounting classes through radio in 1923 (De Fleur & Dennis, 1991).

Even though USA is one of the developed countries, its radio broadcast to schools started with a number of problems. In the beginning, poor audio reception and the cost of equipment were cited as obstacles to use. When these problems were overcame in later years, the lack of fit between the broadcasts and teachers' instructional agenda became more important factors. When television became available, efforts to promote radio instruction in schools were abandoned even with the increase in the number of radio stations in the advent of new FM broadcasting modes or channels by 1945 (Dominick, 2005). In Kenya with the introduction of FM radio stations, the radio signal outreach has really improved and radio broadcast to schools programme is absolutely being received country wide. The challenge has been with audience topology with regards to many mushrooming radio stations each appealing to particular audiences. This has led to audience segmentations according to their preferences (MC Quail, 2005).

In World War II, radio was used as a propaganda tool by the Americans and the Germans. People were being trained on how to use it. The federal government and American industry were faced with the challenging task of providing training for large numbers of military recruits and for new industrial workers. Ways had to be found to train people swiftly and effectively. The U.S. government alone purchased 55,000 film projectors and spent $1 billion on training films. In addition to films, the military used overhead projectors to support lectures, slide projectors to support training in ship and aircraft recognition, and audio equipment for teaching foreign languages. Experience gained from the wartime by the use of these media fueled their subsequent use of radio in schools in the decades to follow (Mowitt, 2011).

In United Kingdom (UK), radio education broadcasting also known as radio broadcasting to schools was started in 1924 when British Broadcasting Company (BBC) started radio educational service for schools (Cain & Wright, 1994). During this time educational radio was being controlled by an educational council appointed by the government. Since then schools broadcasts have had a well- established place in the country. Schools broadcasts' support materials like videos and audio tapes are commonly used in schools due to the Copyright, Designs and Patents Act (GB Statutes, 1988). The Act was passed and allowed education institutions to make recordings, provided they are licensed by the Educational Recording Agency

in UK. In Kenya copyright Act on education materials need to be enforced to discourage any infringement leading to loss of revenue to the government. Previous research studies carried out in the United Kingdom (UK) highlighted some of the reasons why teachers prefer the use of radio broadcast to schools programmes (Capron, 1987). Teachers used radio broadcast to schools programmes in their teachings because they were good for the development of knowledge, skills and concepts (Moses & Croll, 1991). The programmes were able to bring additional expertise and teaching ideas, presenting information in an interesting and stimulating way, giving access to experiences not easily provided by teachers and introducing, extending and reinforcing areas of learning.

With the development of technology in the 21st Century, accessibility and use of radio broadcasts to schools is higher in developed countries as compared to Africa, Kenya included (Chaot & Griffin, 1989). Its acceptability by teachers and schools administrations is also higher as compared to those countries in Africa. The set-up of radio broadcast to schools in Kenya was facilitated by the UK government. Kenya borrowed a lot from the former colonizers; the British government. Some of the lesson programmes which were produced by educational experts from BBC like English sounds and phrases amongst others were recorded as late as 1960s and are still in the KICD archives.

Even though utilization of radio for schools broadcasts started with developed countries, it had seen its extensive use in developing countries. The utilization of educational radio in developing countries was more significant and covered various fields of the development, spanning from agriculture, health, adult education or family planning (Bosch, 2004). The educational elements used to take-the first priority in these countries. Schools broadcasts airing Interactive Radio Lessons in subjects like Mathematics, Science, Civic Education and Language were sometimes taking major chunk of radio broadcasting times in the developing countries.

In India, educational broadcasts started in 1928 and regularized after a decade (Chandar & Sharma, 2003; Kumari, 2004). According to Singh & Sudarshan (2006):

> Bombay was the first station to start school broadcast in 1929 which was occasioned in nature. The Madras station took up in April, 1930. But Calcutta station had its regular school broadcasting programme since November, 1937 (Pg. 59-60).

Radio broadcasts to schools were popular and they use interactive pedagogy known as Interactive Radio Instructions. This allowed learners to not only hear English being spoken, but to also give learners opportunities during the live Interactive Radio Lessons (IRLs) to speak in English. Most primary schools in India had not utilized the radio programmes properly due to various reasons. The medium in India had never received the political attention required to make it widely successful. The technological know-how on the part of the end users was much wanting and the adverse geographical locations of the country with plains, valleys and hills making radio signal receptions not uniform and clear. Radio had played a marginal role compared with that of educational television (Mishra, 2005). Currently, India is placing much emphasis on the development of Internet technologies and infrastructure, making the educational access gap between the privileged classes of people and the poor who are living in rural areas of the society to be on the increase (Agrawal, 2005). Björkman (2006) asserted that the effects of campaign on education quality eroded its gains. There was lack of awareness and technical know-how on the side of teachers, school administrations and learners. The educational authorities, teachers and the learners had not given the radio programmes better attention and commitment it deserved (Pandey et al., 2009).

The lack of awareness and technological know-how experienced in India is much similar to that being experienced in Kenya. There is need for proper awareness to be created and more sensitization to be carried out for the users so as to improve the accessibility and use of radio broadcast to schools programmes in schools (Odera, 2014). Learning environment in India in most parts of the country was not conducive. Learners sometimes were learning under trees and also in noisy places making listening to radio programmes difficult with small functional radio sets having low and limited volume (Banerjee et al., 2010). There was very little if not none in terms of monitoring of the progress of the radio broadcasts making it difficult for any

improvement on the programme. In India, due to the poor radio broadcasts to schools' response, the time allocated for the radio lessons were less as compared to other programmes. This is in contrast with the radio broadcasts to schools in Kenya where the time allocated to radio lessons is generally uniform and constantly. There is normally 20 minutes durations per lesson allocated.

Radio is still the dominant mass-medium in Africa with the widest geographical reach and the highest audiences compared with television (TV), newspapers and other information and communication technologies (ICTs). In Zambia, new IRLs series are developed to reach out to those learners who are out of schools and have become increasingly vulnerable due to poverty and the HIV/AIDS scourge (UNAIDS 2004). Radio broadcasts to schools, airing Interactive Radio Lessons (IRLs) are used to effectively overcome obstacles of access to education by learners in Africa, and increase chances of learners receiving education in any part of the country. IRL still retains its core elements as it continues to evolve to meet new educational and social challenges.

Nigeria started radio broadcasts to schools in 1960 (Jegede, 2002). In 2002 Interactive Radio Lessons (IRLs) was introduced in Nigeria by the Literacy Enhancement Assistance Project (LEAP) which was a USAID-funded project implemented by Education Development Center (EDC), Research Triangle International (RTI) and World Education, with EDC as the lead implementing partner (Solomon, & Sankey, 2010). IRI programs were delivering contents from approved curricula and model learner-centered teaching methods through interactions between the radio characters, teachers and pupils. The IRI methodology was designed to shift focus from the typical teacher centered way of teaching to a more active methodology that engages teachers and pupils in and outside the classroom settings (NERDC, 2009). The objective of LEAP was to improve the ability of Nigerian children to read and write English and to do basic mathematics by the end of primary level in both public and Islamiyya schools. LEAP established close collaboration with the Federal, State and Local communities (Solomon et al., 2010). IRI is being used in developing countries worldwide including Kenya to improve the quality of education across a range of school subjects and to serve as a form for teacher development.

In Uganda, educational broadcast was established in 1964 by the government. A section in the Ministry of Education (MOE) was created to produce educational programmes for all schools and colleges in Uganda. The Ministry of Information was tasked with coordinating and broadcasting the educational radio programmes (Kiwanuka- Tondo, 2006). This later changed after the educational broadcast was interrupted with the political turmoil in Uganda during the reign of Iddi Amin Dada. In 1985 Directorate of Education Broadcast (DEB) was established which resumed the educational broadcasts to schools and colleges (Engoloa, 1985). The radio educational programmes were to supplement the schools and college curricula as audio visual teaching aids. They were also to cater for growing demand of education by then as there were no enough qualified teachers. It was during the time expatriates were leaving Uganda while there were no enough indigenous teachers to replace them. Radio broadcasts to schools programmes were to be used as substitutes for teachers when the colonial masters were leaving the country (UNESCO, 2008). Radio educational broadcast in Uganda has suffered a lot of constraints which were political, economic and social. The political and economic constrains had taken the lion share. Uganda suffered politically under the dictatorship rule of Iddi Amin Dada leaving the country in a deplorable economic state with lack of technical experts, poorly developed infrastructure and lack of political good will. The political situation became stable when President Yoweri Kaguta Museveni took over in 1986. Since then the country has enjoyed peace and a lot of development transformations like radio infrastructural development, modes of transmission and technical know-how have taken course, strengthening the accessibility of the radio broadcasts to schools programme (UNESCO, 2008).

Tanzania started broadcasts to schools programme in 1954 with limited accessibility due to a small transmitter which could only cover few areas. The coverage improved after two years with the acquisition of a bigger transmitter. Currently there are over 9000 schools benefiting from radio broadcasts to schools programme (Singh & Sudarshan, 2006). Schools radio broadcast was being administered by the Ministry of information and Broadcasting through the Director of Radio Tanzania in 1977. The actual production of radio educational programmes was done by educational broadcasters from the Ministry of National Education (MONE) with the formation of a media education unit in the office of Commissioner of National Education, School of National Education (MOE&VT, 2007). The technical side and transmission of the production was done by

Radio Tanzania. The Ministry of National Education prepared and distributed educational support materials to schools. There were sub- committees formed for actual planning of the programmes in conjunction with other stakeholders in the education sector (Harry, 2007). The aim of the educational broadcasts to schools was to bridge the knowledge gap. Due to lack of enough competent teachers and other teaching resources like text books in rural areas, its access was vital mostly in the affected areas (UNICEF, 2000). The radio lessons were being broadcasted for two hours in every school going days with each programme covering twenty minutes duration, on air for six days in a week. This translates to 576 radio programmes being broadcasted annually to primary schools, while those in secondary schools were only 240 radio programmes (MOE&VT, 2007; Steadman Group, 2007).

In Kenya Radio Broadcast to Schools (RBS) programme started in 1963 when the Schools Broadcast Division (SBD) of the Ministry of Education (MOE) was established as a small unit (KIE, 2008). Its aims were to widening access to education, improving quality of education, training of teachers at lower cost and diffusing superior teaching methods to serving teachers. It was expanded in 1976 into an Educational Media Service (EMS) which is currently known as Media and Extension Services (MES), established at Kenya Institute of Curriculum development (KICD) (KIE, 2005; Mainye, 1985). The mandate of MES still is to produce educational support materials and broadcast educational programmes in both Radio and Television and disseminate them through the KICD EDU channel to all learners in schools (Odera, 2005). Currently the TV digital signal is being carried by SIGNET, a digital platform service provider based at Kenya Broadcasting Corporation [KBC] while the radio one is through KBC English Service Channel (KIE, 2008). For the English Service Channel to be received on a digital platform, KBC or KICD should be able to subscribe to either SIGNET or any other digital platform service provider to be able to carry their signal. Media and Extension Services Department at KICD produces educational support materials for schools in electronic and print forms. It is well equipped with state of the art facilities necessary for the productions of educational programmes.

In 1995 Radio Broadcast to schools through the national broadcaster was discontinued due to high costs of airtime after KBC had obtained its corporate status in 1992. The Ministry of

Education could not meet this cost through the exchequer. During this period MES was mostly producing radio programmes and packaging them on CDs, DVDs and Audio Tapes which were then disseminated through the outreach programmes at fees. The radio programmes are still packaged the same way and charged different fees according to the formats of the packages for the clientele (Edwin, 2007).

In 2002 Radio broadcast to schools resumed through World Space. World space was considered an alternative mode of transmission by the Ministry of Education Science and Technology (MOEST) through KICD due to its cost and wider coverage by the use of satellite transmissions (MOEST, 2005; KIE, 2005). The contents of Interactive Radio Lessons (IRLs) aired to schools were being broadcasted via World Space Satellite (Afristar) using digital audio receivers. KICD was providing the broadcast content of educational programmes while World Space was transmitting the programmes via their satellite. This was visionary and a productive step in the education sector for learners, teachers, the general public and other stakeholders as it was the time free primary education was initiated by the government. But it never lasted for long as it had with it some teething problems (Odera, 2013).

In 2007 KICD in consultation with the Ministry of Education and KBC, revived the radio broadcasts to schools through the national broadcaster channel KBC. The revival followed the lack of World Space to meet the objectives of the radio broadcast to schools. The radio broadcast was not reaching all the schools in Kenya due to lack of educational hardware like the World Space radio receivers which had not yet been distributed to 30,000 schools as was planned. The maintenance cost was expensive to schools as the receivers were running on batteries, and there was lack of technical know- how in World Space radio receivers in terms of their operations (Dorcah et al., 2014). World Space transmission at long run became more expensive for the government than when it was being done through KBC radio. The Ministry of Education through KICD had to pay a total of Kshs. 238 million per year to World Space while currently it pays around Kshs. 40 Million to KBC for airing radio broadcast to schools programme (KIE, 2008).

The improvement of education and increased student learning in Kenya and any other part of the world are dependent on a number of factors which must work together. Some of the key factors that schools must put in place to make technology a meaningful part of the educational experience include; adequate technological development, trained personnel to operate or use the technology, time within which the school day allocate to its use, technical assistance to respond to questions and provide help when problems arise (Rogers, 2005). Means for efficiently repairing of equipment when faulty, a training plan for ensuring that new personnel receive training and that continuing personnel increase their knowledge and skills on the use of equipment, and equipment upgrade plans to ensure prompt and efficient replacement before being obsolete are very vital for the smooth running of the programme.

It must however, be acknowledged that even when a country seemingly does everything right , other factors, both inside and outside the education system affect the country's ability to reap the full potential or rewards of its investments (Republic of Kenya, 2012). Accessibility of the media does not end at the teachers levels. For the broadcast lessons to be of importance, it has to reach learners who are the major consumers. There should be awareness and capacity building created for schools so that teachers and learners are able to know that Interactive Radio Lessons are being aired currently through KBC English service channel to all the learners in primary and secondary schools, including teachers' education and training institutions in Kenya. They should also know how to operate their radio sets if at all the sets are there in schools. The distributions of schools broadcast time tables which are yearly prepared and disseminated to schools by KICD should be checked to know whether or not they are reaching schools in good time for prompt use by the schools. The radio broadcast time tables are having information concerning the mode of transmissions of the programmes in accordance with the frequency range of an area. The time tables should be picked from District Education Offices all over the country or downloaded through KICD website; www.kie.ace.com.

Since resuming radio broadcast to schools by Kenya Institute of Curriculum Development (KICD) in 2007 through KBC, there has been a lot of transformations in the education sector in line with the promulgation of the Constitution of Kenya in 2010 (Dorcah et al., 2014). According

to the Kenya Gazette Supplement No. 11 (Acts No. 4) of 2013 by the act of parliament, KICD which was formerly KIE went through the transformational changes in its mandate and operations, acquiring a new status and name in accordance with the constitution of Kenya, 2010. Its mandate was expanded to include and not limited to; develop, disseminate and transmit programmes and curriculum support materials through mass media, electronic learning, distance learning and any other mode of delivering education and training programmes and materials, and promote equity and access to quality curricula and curriculum support materials (KICD, 2013).

In the radio unit at KICD, electronic support materials are being produced for dissemination to schools. These electronic curriculum oriented programmes are produced to support; key learning areas within the curriculum, difficult areas for both learners and teachers within individual syllabuses, health, environmental education and other emerging issues for schools and the general public, and new and innovative methods of learning and teaching in specific subject areas (KIE, 2008). With the development of the digital platform in Kenya overseeing the switching over of analogue signal to digital signal, KICD is rightfully poised to transmit its own IRLs to its target audience. The development of digital radio programmes and e-learning materials put the feature for packaging and accessing learning materials on other platforms like internet live streaming and mobile telephony through cloud computing by relevant operating service providers like Safaricom, Intel and Airtel among others.

1.3 Statement of the Problem

Radio broadcasts to schools programme was introduced in 1960's by the Kenyan government with the aim of widening accessibility to education, improving quality education, diffusing superior teaching methods to serving teachers and training of teachers at lower cost (MOEST, 2004). This has been a national priority in Kenya since the inception. The broadcast to schools was re-established in 2003 by the NARC government to mitigate some of the challenges which were brought about by Free Primary Education (FPE). The introduction of Free Primary Education (FPE) saw with it a high enrollment rates in primary schools against the backdrop of poor teaching resources and lack of enough qualified teachers amongst other challenges (KIE, 2008).

According to Bosch, (2004) radio is still a tool in bridging the education gap. Even though in the MacBride Commission report; "One World, Many Voices", only a paltry 10% of the radio spectrum was allocated to developing nations, it is still a medium for informing and educating the masses in this digital era (UNESCO,1980). Thomas (2001) stated that in many areas of the world especially in the developing countries, radio is still the only medium through which educators are able to reach a mass audience, simultaneously and at relatively low cost.

Schools in several parts of Kenya, especially in rural areas are not using radio broadcast to schools programmes and yet learners in these remote area schools are very much affected in terms of access to quality and equitable education (Odera, 2014; Bosch, 2004). These schools do not have access to radio broadcast to schools programme and are not able to make the best use of live Interactive Radio Lessons (IRLs) which are supposed to supplement learning in schools (Odera, 2014; Wambaria, 2003).

The government of Kenya is investing a lot in radio broadcast to schools programme in terms of human resources, money and infrastructural development. Annually, KICD spends around Ksh.40 Million for the transmissions of the programmes alone exclusive of the production costs of the radio programmes (KIE, 2008). Despite all this spending by the government, available records still show that its accessibility and proper utilization in schools is low due to some major technological challenges being faced by the programme (Odera, 2014; KIE, 2008).

According to UNICEF (2000) learning occurs anywhere, but the positive learning outcomes sought by educational systems happens in quality learning environments with good infrastructure such as having quality school facilities, adequate instructional materials and textbooks, good working conditions for learners and teachers, and the ability of teachers to undertake certain instructional approaches, and lastly class size which in some cases are lacking in rural areas.

The radio broadcast to schools is to increase access to quality and equitable education for all learners in primary, secondary and tertiary colleges especially in rural areas which are hard hit economically (Kiruhi et al., 2009). There is therefore need for monitoring and evaluation to be carried out in order to quantify the progress of the programme in achieving the mandate of the government for access to quality and equitable education for all. The evaluation is key in helping to addressing some of the social and economic problems bedeviling some of the learning institutions in Kenya. Education is the socio economic pillar in the Kenyan Vision 2030. In order for Kenya to spur her economic and social growth and to be at par with other developing nations there is need for the adoption and development of technology in most of her sectors like education and agriculture among others.

Even though radio broadcast to schools programme has been on for a long time now, some studies which have been done have shown that the programme is still having its shares of challenges (Odera, 2014; Wambaria, 2013). Most of these studies in Kenya focused on the general aspects while for any meaningful diffusion of technology or innovation, the technological development is important in its rapid growth. Looking at the technological challenges with a view of addressing those challenges is a process in the right direction given that radio is one of the ICT tools and the world is now a global village. According to Umoru-Onuka (2002), the effective use of radio for instructional education has been affected by its technological challenges limiting its availability and access.

In African countries, some of the reasons behind this poor utilization of radio broadcast to schools programme by schools have been attributed to the technological challenges faced by these schools in their respective regions (World Bank, 2009; UNESCO, 2008; Yusuf, 2005; Sharma, 2003). With the technological development in the world where use of even e-learning has taken shape in education, it is relevant to look at the technological aspect of radio in learning. Looking at some of the technological challenges affecting use of radio broadcast to schools in Kenya will go a long way in addressing other ICT modes of educational instructions in the 21st century?

According to the Republic of Kenya (2007), Kenya recognizes that the education and training of all Kenyans is fundamental to the success of the Vision 2030 and equips citizens with understanding and knowledge that enables them to make informed choices about their lives and those of the society. The education policy in Kenya vision 2030 emphasizes on the provision of globally competitive quality education, training and research to her citizens for development and enhanced individual wellbeing (Republic of Kenya, 2012). Access to quality education is a driving force towards the realization of the Vision 2030. Quality education includes an environment that provides adequate resources and facilities amongst others (UNICEF, 2000). Technology has changed the educational way of learning. Instructional education or learning through ICT tools like radio, television, internet and even mobile phones are the way to go nowadays.

The previous study designs had not also focused on the feedback process in addressing some of these challenges. In this research, it has accommodated the feedbacks from KICD and KBC apart from those from the schools' administrations. The feedback process design has not been applied in some known researches which have been done here in Kenya even though it is more objective and a good test for validity. The research has addressed some of the technological aspects to promote proper access and use of radio broadcast to schools programme as an instructional technology in schools (Butcher, 2003; MOEST, 2004).

Therefore, the purpose of this study is to evaluate the technological challenges faced by all primary schools in Rangwe division, Homa Bay County on radio broadcast to schools programme, and to identify ways of mitigating them so as to improve on its accessibility to quality education for all learners in the region. This will go a long way in improving the socio economic status of the young people in the area which is currently very low (World Bank, 2007). In ascertaining the levels of technological challenges faced by these primary schools will help in quantify the progress of the programme which has been geared towards achieving the educational goals set by the government and considered very import in the realization of the Vision 2030.

1.4 Objectives

1. To establish the mode(s) of transmissions of KBC radio broadcasts to schools programme.
2. To identify the infrastructural development within Rangwe division.
3. To identify the educational hardware and software in primary schools within Rangwe division.
4. To establish the geographical location of Rangwe division in relation to radio signal distributions.
5. To determine the technological know-how on radio operations by the teachers who are in this case the end users of the radio broadcast to schools programme.

1.5 Research questions

1. What is/are the mode(s) of transmissions of KBC radio broadcasts to schools programme?
2. Are there infrastructural technological developments of transmission by KBC in Rangwe Division, Homa Bay County?
3. Are there educational hardware and software in schools within Rangwe Division?
4. How is the geographical location of Rangwe Division affecting the receivership of KBC radio signals distribution strengths in schools?
5. How is the technological know-how on operating the radio sets by teachers affecting the radio broadcast to schools programme in the region?

1.6 Justification of the Study

The technological challenges affecting radio broadcast to schools in Rangwe division is not known and the research gap was covered by this research. The government of Kenya through KICD is spending colossal amount of money annually on the project besides other requirements in preparing and broadcasting the radio lessons. A county like Homa Bay has not had any follow

ups to ascertain the technological challenges of the radio broadcast to schools programme despite its adverse geographical locations (KIE, 2005; 2008). The topography of the area is composed of plains, valleys and hills. It is always necessary with a running project to do follow ups. The follow ups are to quantify and know how successful, acceptable and accessible the project is doing.

Access to quality education will go a long way in improving the performance and change in the mindset of the young people. Young people are the engine to drive the economy of a country and with better education being offered it is possible to realize this.

Homa Bay County is situated along Lake Victoria region. Some of its places are on the plain, valleys and others on the hilly side. Radio signal receptions on the leeward side of the hills are generally poor. Rangwe division has the same topography making it necessary to ascertain the technological and infrastructural development of the region. This will go a long way in knowing the radio signal strengths and its distributions in schools within the region. Radio signal reception is vital in the adoption process of radio broadcast to schools programme in the area. A strong radio signal will encourage the users of the programmes to be more interested in the those programmes being aired through the KBC English service channel with other factors being kept constant.

Radio broadcast to schools has got a lot of benefits both to the learners and teachers as well. This distance education is good in rural areas where poverty rate is high and the quality of education is compromised due to lack of enough qualified teachers and lack of learning resources. Pupils in rural areas should be able to get equitable and quality education like the rest in urban areas. According to Nyutho in the Curriculum Watch Journal by KIE (2007), he said:

> [Any technological systems like use of radios for IRLs, that does the reverse of bridging kowledge gap]..... is entrenching inequalities and disenfranchising the

learners, especially from peripheral regions who have limited education resources (Pg. 21).

Improved technological development leads to improved access to quality education, having a lot of benefits to the country as a whole. Kenya as a country is able to achieve her middle income status and be at par with the rest of the world if it has well-endowed manpower to steer it to prosperity ladder (Republic of Kenya, 2012). This well-endowed manpower is realized by a well robust education system and a positive increase in the level of education. Education is a key instrument to any country's economic and social development (Maliyamkono, 1999).

With quality education being offered by radio broadcast to schools programme, its proper utilization can only be achieved by making sure that the country is well developed technologically. To achieve this, the infrastructure should be put in place, people are empowered through training, and a lot of awareness and sensitizations created.

The accessibility of these quality radio lessons when enhanced by availing teaching and learning resources, transforms behavior, perceptions and attitudes of youths. They will start thinking of new ideas and ways of doing things differently and better to make a decent living, alleviating the levels of poverty and reduce the prevalence rates of HIV/AIDS cases in the division and to the country at large. The impact of HIV and AIDS is often magnified in conditions of poverty and to eradicate poverty is to empower people educationally (Gillespie et al, 2009; Dinkelman, Lam, & Leibbrandt, 2007; Mishra et al, 2007). It is the citizen of a nation that drives the economy of the nation. The more educated and healthier the citizens are with more positive inputs they contribute in driving the economy of the country, the wealthier a nation becomes. Therefore, education is the backbone in the development of a nation.

For the success of radio broadcast to schools in the region, there has to be support from the schools administration, the government and the society in general. The Kenyan government is

supporting the programme by investing heavily in radio broadcast to schools. The infrastructure and human resources that are being put in the productions and broadcasting of radio educational programmes for schools and the general public by KICD is enormous. Only high accessibility levels and proper utilization of radio broadcasts to schools programmes both from the teachers' angle and the learners justify the kind of heavy investments put in place by the government towards achieving quality education. Without the proper monitoring mechanisms put in place towards its achievements then the radio broadcast to schools programme is not worth its salt.

The study will provide information on the technological challenges being faced by the radio broadcast to schools programme in primary schools within Rangwe division. Many schools within the division are performing poorly academically (KNEC, 2013). The findings of the research should be used by the relevant authorities in addressing such challenges like poor performances so as to help schools faced with such problems to improve their academic standards. Through the findings, education stakeholders like KICD, the government and the private sectors among others are also able to address other challenges like accessibility, equity and quality of education in Kenyan schools.

1.7 Limitations and Delimitations of the Study

The research was carried out in Rangwe Division, Homa Bay County. The division has got two zones namely Rangwe and Randung zones with each 21 and 19 primary schools respectively, including the private ones.

The study used a descriptive survey design where 25 primary schools in Rangwe Division, Homa Bay County were randomly sampled, representing 59.5% of the population. The respondents were; 2 Area Education Officers at the zonal levels, 2 KICD radio programme managers, 2 KBC radio technical/ engineering staffs, 25 public and private primary school headteachers, 50 private and public primary school teachers and 150 pupils of different gender in classes 7 and 8. Cluster sampling technique was used in selecting schools and headteachers. Purposive sampling was also used in selecting teachers and classes 7 and 8 pupils who were randomly sampled in their classes. Observations were made by the researcher. Data collection was done using semi

structured questionnaires for the Area Education Officers, headteachers, teachers, learners, KICD radio programme managers and KBC engineering staff members.

Attitudes of learners and teachers could jeopardize the validity of data collected for analysis and interpretations. Measures were put in place to safe guard the validity of the data collected through the employment of triangulation. The study used observations as well as one of its methods of data collection. Triangulation helps in increasing credibility and validity of the research at it captures different dimensions of the same phenomenon under study.

Rangwe Division in Homa Bay County was purposively selected for several reasons. It is one of the divisions where monitoring and evaluation by KICD has never been done despite the poor performance in KCPE and KCSE by the schools in the region (KIE, 2005; KIE, 2008). In the region there is lack of evidence to ascertain the technological and infrastructural development concerning radio broadcast to schools programme. Rangwe division is one of the 3 divisions in Rangwe constituency, Homa Bay County. Other divisions are Upper Nyokal and Lower Nyokal. Homa Bay County has 7 constituencies namely; Rangwe, Mbita, Suba, Rachuonyo, Kasipul Kabondo, Homa Bay town and Ndhiwa. Rangwe covers an area of 259.90 Sq. Km. It boarders Rachuonyo to the south; Homa Bay, Gwasi and Ndhiwa to the North, Suba and Mbita to the West and Kisii County to the East. The composition of schools in the region is very rich in generating ample, varied and comparative information because some of the schools fall within the urban areas as well as in the rural areas. The region has also both public and private schools.

1.8 Operational Definitions

Accessibility: This is the extent to which an ICT tool like radio is made available for use in the radio instructional programmes by learners for learning purposes. It measures the availability of Interactive Radio Lessons to learners and teachers in different schools.

Analogue Radio Signal:	This is continuous modulated radio signal which contains time-varying quantities. The signal is received and transmitted from any media station through an analogue machine or analogue converter.
Broadcast to Schools Time Tables:	These are charts showing the subjects that are being aired through the radio with their slotted times and classes. They also give the frequency spectrum for tuning the radio sets in different locations.
Digital Radio Signal:	This is discrete radio signal produced by any digital machine or digital converter and received through the digital transmitters of any station. Digital signal has got discrete value of 0 or 1 at each sampling point.
Educational Hardware:	These are equipment used as signal carriers or to transmit educational learning materials to learners. Examples are functional radio sets, CD/DVD players and mobile phones among others.
Educational Software:	These are learning materials and aids being used in the radio broadcast to schools programme by teachers and learners. Examples are Interactive Radio Lessons (IRLs) of different learning subjects which are curricula based, radio broadcast time tables and teachers guides.
Geographical Location:	This is a demarcated area within a region with different signal receptions due to its topography, like in the case of Rangwe division.
Interactive Radio Lessons (IRLs):	These are radio lessons which are more participatory. Learners are able to exchange their views and opinions with the radio teacher as well as the class room teacher.

Jubilee Government:	A political coalition party in Kenya, formed by two main political parties which are; The National Alliance (TNA) party and United Republican Party (URP) and other small political parties.
Radio Broadcast Frequencies:	These are the frequency spectrum of the radio signal receptions in different locations which are Short Wave (SV), Medium Wave (MV) and Frequency Modulation (FM).
Radio Broadcast:	This is a programme which is run by KICD to all schools in primary, secondary and tertiary levels through KBC English radio channel and even the general public.
Radio Teaching Resources:	These are radio broadcast support materials such as broadcasting time tables and teachers' guides that facilitate the use of radio broadcast to schools programmes.
Resources:	These are teaching aids such as; Markers, Manilla paper, masking tapes, printer/ruler, tape measures, pictures, racing cars and charts on distance that support and enhance radio programmes.
Teachers' Guides:	These are instructional teacher handbooks that describe the lessons, teaching and learning experiences and instructional timings.
Technological Challenges:	These are challenges brought about by inadequate development of technological infrastructure and the hardware among others hampering the adoption process of technology as a tool for development.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

This chapter contains a review of relevant literature according to the objectives of the study. It identifies the gaps in the literature which the study sought to contribute to and put them in perspective in line with the concept of the study. The rationale of the study based on the reviewed literature is also discussed. The last two sections of this chapter present both theoretical and conceptual frame work of the study.

2.1 Interactive Radio Lessons (IRLS)

The Radio Broadcasts to Schools (RBS) programme being aired through KBC English service channel has been in existence since 1963 (KIE, 2008). The radio lessons are very interactive providing learners with opportunities to interact with the radio teachers. The lessons are highly educative and well prepared by KICD curriculum experts in collaboration with other stakeholders like quality assurance experts from the Ministry of Education and teachers in their respective subject areas (KICD, 2013). The radio broadcast programme was started by the government of Kenya in order to increase access to quality and equity in education for all learners in primary, secondary and tertiary colleges especially in rural areas which are economically hard hit (Kiruhi et al., 2009). This has not been without challenges. This literature review looks at other research work in line with the study exploring the technological challenges affecting accessibility of KICD radio broadcast to primary schools in Kenya.

2.1.1 Transmission Mode

Radio broadcast to schools programme in Kenya is being transmitted through Kenya Broadcasting Corporation (KBC) English channel. The KBC radio signals are transmitted via Short Wave (SW) which is nowadays not being used, Medium Wave (MW) and Frequency Modulation (FM) transmitters (CCK, 2009; KICD, 2013). Radio broadcast to schools programme being transmitted through KBC English service channel is received through the Medium Wave (MW) and Frequency Modulation (FM) modes (See Appendix M).

KBC being a national broadcaster, and the first one to start operating in Kenya started its transmission in Short Wave (SW) mode. The mode was not well developed due to rapid technological changes and high requirements of resources to build the infrastructure. Short Wave (SW) was not also clear in terms of its signal receptions which led to its upgrade (UNESCO, 1965). Other challenges were the bandwidth space which was limited and was being consumed more by the mode. Due to all these challenges, KBC embarked on the upgrade process which was also necessitated with the development of technology. The upgrade brought with it the Medium Wave (MW) and later on the Frequency Modulation (FM) modes.

The lack of enough bandwidth allocations were partly due to unfair airwaves allocations by the developing nations under the International Telecommunication Union (ITU). According to Sean MacBride report titled "Many Voices, One world" of the New World Information and Communication Order (NWICO or NWIO), the monopoly status of transnational corporations in terms of communications technology was perceived as a threat to national independence. There were unfair divisions of the radio spectrum and the allocation of the geostationary orbit parking spots in space for satellites. A small number of developed countries controlled almost 90% of the radio spectrum. Much of this was for military use. Satellite broadcasting of television signals into third world countries without prior permission was widely perceived as a threat to national sovereignty (Golding, P. et al 1997). The UN voted in the early 1970s against such broadcasts. NWICO was formed in the late 1970s by United Nations Education, Scientific and Cultural Organization (UNESCO) under the umbrella body of United Nations (UN) with the mandate of coming up with a set of recommendations to make global media representation more equitable for the free flow of the media.

While only a paltry 10% of the radio spectrum was allocated to developing nations, radio was and is still a medium for informing and educating the masses. Thomas (2001) states that in many areas of the world, radio is still the only medium through which educators are able to reach a mass audience, simultaneously and at relatively low cost. The effective use of radio for instructional education has been affected by its technological challenges limiting its availability and access (Umoru- Onuka, 2002). There are technological challenges like the transmission

modes and infrastructural development among others which affect the accessibility of radio broadcast to schools acting as stumbling blocks towards achieving its goals of quality and equitable education.

The field of education has been affected by ICTs in general and radio in particular, which have undoubtedly affected teaching, learning and research (Yusuf, 2005). In terms of development, ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change in their teaching methodology (Davis & Tearle, 1999; Lemke & Coughlin, 1998; cited by Yusuf, 2005).

According to KIE Curriculum Watch (2007, Pg.21) Nyutho says "for developing countries, sound ICT investments are inevitably the fastest way of bridging the knowledge divide that hampers economic take-off". Interactive Radio Lessons delivered, stimulate interactive learning among the radio teachers and characters. The IRLs deliver contents from approved curricula and model learner-centered teaching methods through interactions between the radio teachers and learners. The IRLs methodology is designed to shift focus from the typical teacher centered way of teaching to a more interactive one that engages teachers and learners in and outside the classroom settings (UNESCO, 2008). Learners are required to react to questions and exercise through verbal or physical responses to radio artists under the guidance of the radio teacher, supervised by the classroom teacher (Bosch, 2004).

According to Mohammed (2013) on the challenges and opportunities in the use of radio broadcast for development in Ethiopia, the radio reception quality with the use of Short Wave (SW) frequency was a challenge to people when tuning to various stations. The frequency had got poor signal quality making it difficult for listeners to be able to tune and get the information being broadcasted.

According to Bosch, (2004) radio is still a tool in bridging the education gap. However, in Kenya some schools do not have access to radio broadcast to schools programme and are not able to make the best use of live Interactive Radio Lessons (IRLs) due to the poor mode of transmission making the signal difficult to be received clearly (Odera, 2014; Wambaria, 2003).

With the development of technology and freeing of the airwaves by the Kenyan government in line with ITU, Frequency Modulation (FM) mode was developed (KIE, 2005; CCK, 2009). According to Njeru (2005) the KBC Medium Wave (MW) transmitters which were installed in 1993 could not continue providing quality radio signal receptions in the face of mushrooming FM transmitters which are capable of providing high quality stereo sounds and good signal receptions. Another drawback to Amplitude Modulation (AM) radios is the high power required for transmission which made KBC to reduce the number of its transmitters hence reducing its previous coverage from 80% to 50%. Listeners currently do not tune to AM radio stations for their lack of clear signal transmissions (Njeri, 2005). Frequency Modulation (FM) transmission started in 1996 when Kenya telecommunication sector was liberalized. KBC was the first to commission a metro FM station which was the first commercial FM channel to be started in Kenya. This was followed closely by Capital FM radio station which is a private station. Currently there are many FM radio stations in Kenya mostly owned by private entities. At the same time GSM operators, ISPS and other ICT providers entered into the market (Njeru, 2005).

Dikshit (2002) said that using terrestrial FM radio transmitters has got lots of advantages. The FM radio transmitters in conjunction with satellite radio transponders can enable the global distribution of local content. FM radio when used as a teaching tool with the accommodation of text data transfer technology, the listener or receiver is able to receive delivered text via a computer network. In short, the introduction of this new technology creates a new radio/ text environment. The convergence of radio with computer technology now allows learners to send and receive text messaging to the radio station. A dynamic which greatly enables and enhances learning using low cost FM radio delivery technology as it allows feedback to take place. Chaudhary (1996) concurred with this technological delivery in an experiment he conducted using radio-text at Yashwant Rao Chavan Maharashtra Open University, Nasik, India. In the

study, he found out that there was a high satisfaction of more than 80% among learners who were using radio-text technology. Thus FM radio stations are positioned as ideal mode for fulfilling a country's educational, developmental, and socio-cultural aspirations and needs. In Ethiopia, Frequency Modulation (FM) radio stations have developed very well and are being received in almost all the parts of the region. This has been due to its ease of setting the network stations (Ward, 2011).

Currently the world is on digital platform. All television and radio signal have been moved from the analogue signals to digital signals. This is in line with the ratifications of ITU and other world information and Communication bodies to move all the world transmissions from analogue to digital platform. Digital platform is a mode of transmission which has been around since the start of the computer era. The digital mode uses the OFF and ON switch by use of binary digits of 0 and1 respectively to send information. Most digital modes require a computer to be interfaced with the radio to assist with sending and receiving the data. The modes also require Terminal Node Controllers (TNCs) with chips that support particular modes.

KICD is tasked with the mandate of producing and disseminating educational support materials in both print and electronic form. In that connection, KICD operates both Radio and Television education channel to disseminate education contents to learners in primary, secondary up to tertiary levels of education through the KICD EDU channel (Odera, 2005). The TV digital signal of EDU channel is being carried by SIGNET; a digital platform service provider based at Kenya Broadcasting Corporation [KBC] while the radio one is still through KBC English service channel (KIE, 2008). The use of radio programmes in teaching and learning has been recognized as useful in instructional education, for it motivates students to learn (Ball, 1974; Walugere, 1983).

Taking transmission problems in to consideration, KBC embarked on wireless technology which came in handy in providing cheaper transmission and receptions solutions. With the development of this VSAT technology, KBC restored its listenership and viewership by boosting on the

quality of both radio and TV signals making them more clearer and accessible to anyone with a satellite dish. The satellite dish is normally out of reach of the majority poor as it is more expensive than the terrestrial television receivers making it available for the rich and the middle class people (Njeru, 2005).

2.1.2 Infrastructural Development

The level of accessibility and use of any ICT tools like radio mostly depend on the infrastructural development of the whole network. Uses of latest technological hardware and software resources are key features in the diffusion of technology (MC Quail, 2005; Gulbahar, 2005). Education is one of the socio-economic pillars in any country. Kenya is not left behind as education forms a major part of government policies and even well reflected well in the Kenyan Vision 2030. Now the country's educational technology infrastructure needs to be on top of the national telecommunications and information technology infrastructure in order to make quality education accessible to all, especially the rural majority.

Availability of adequate infrastructure development to support the deployment of ICTs in schools is a tremendous challenge being faced by most schools in Kenya. Apart from the high initial cost of purchasing and setting up the requisite infrastructure like transmitting stations, boosters and masts, the maintenance and upgrade costs are quite high. More so the cost and efforts of supporting such infrastructure are roadblocks to the successful usage of ICTs in schools, especially in poor and remote areas. According to Mohammed (2013), in Ethiopia the poor radio signal reception had been necessitated by lack of relay systems to receive and transmit the radio signal in some parts of the region to ensure good quality signal receptions in those areas where the signal had been poor.

KBC being a national broadcaster and the first one in Kenya to operate both radio and TV stations, boasts of well endured infrastructural development in the country. Despite this endorsement, there are still challenges being experienced by KBC transmission frequencies or signals. There is therefore a need to monitor and access the technological challenges that might

be experienced across the county with a view of addressing them. The research was to evaluate some of these technological challenges in Rangwe division of Homa Bay County concerning radio broadcast to schools programme.

However, with the massive masts of KBC already in place throughout the country, it has come in handy as a common carrier provider. Many broadcast stations in Kenya do share the KBC broadcast infrastructure at minimal costs. This has been in line with the formally CCK (2009) directive that directed broadcast operators to relocate their installations to common sites in order to minimize Radio Frequency (RF) effects on the population, for easier monitoring and maintenance costs and for saving on installation costs by other stations. Even mobile service providers also co-host with KBC to ensured faster and uniform expansion of broadcast/ GSM services to most areas of the country (Njeru, 2005).

According to UNESCO (2008) another basic requirement for the use of technology is the availability of electricity power and telephony. Countries within the South Asian region were having large areas which were still without a reliable supply of electricity power, and the nearest telephone booths or places were miles away. Power situations in rural and remote-rural areas even in some advanced countries in the region were still undependable. All these challenges affect the functioning of any ICT initiative. Different and frequent power cut schedules can really play down the use of radio broadcast to schools programme and other ICT tools. Power outages and its fluctuations add to the high maintenance costs of the educational hardware like radio sets and computer hardware (ICT Global Alliance, 2009).

Kenya as a country is investing a lot in radio broadcast to schools programme in terms of money and infrastructural development (MOEST, 2005). The Ministry of Education Science and Technology policy framework of 2005 indicated that there were a number of challenges concerning access to and use of ICT in Kenya, including high levels of poverty, limited rural electrification, and frequent power disruptions (MOEST, 2006). Currently, Kenya has embarked on rural and schools electrification programme of which all schools within the republic are to be

connected to the grid by 2016. Every school is to be connected with the electricity power according to the Jubilee's government 2013 election pledge which promised free laptops to primary school pupils. This has recorded high boost in terms of infrastructural development in the country. His Excellency the President, Uhuru Kenyatta said:

> In 2013, only 8,104 of our primary schools were connected to electricity power. To create social equity, and to improve the quality of education, my government has in the last two years connected an additional 14,251 primary schools, meaning that 95% of our primary schools are now connected. Indeed, in the next two months, the remaining 5% will be connected (Standard Newspaper, 21 September, 2015, Pg.13).

The cost of electricity power has also been reduced by 30% by the government due to the diversification in the power generation. The diversification in the production of electricity power has seen Kenya also relying in geothermal power generation plants apart from the hydro power generation ones.

The Kenyan government also supports financially the instructional education through radio broadcast to schools programme. The annual transmission costs are always paid by the government through KICD which is under the Ministry of Education. According to UNESCO (2008) most governments in the developing countries, given the current budgetary and resource constraints lacked the will for widespread investment in ICTs for education purposes. It is, therefore, critically important to better understand the cost-benefit equation of the wide range of ICT options and uses in order to effectively target-spend the scarce resources. Economies of scale are achievable in distance education, although such Programmes typically require large up-front investments. Some of these costs may be shifted from the public sector to the private ones, but this in itself raises significant equity and access issues (World Bank, 2005).

Berman and McLaughlin (2004) found that a significant level of complementing infrastructure support was important, and that innovations attempted was not possible without proper complementing infrastructure. Kritek (2006) contended that the problems of complementing infrastructure insufficiency are not likely to be solved by providing only more money but positive attitude on the parts of administrators and teachers are believed to maximally increase the smooth implementation of innovations.

In his doctoral dissertation, Ottesen (2006) said that one fundamental problem facing ICT Policy implementation and integration in schools was the lack of complementing infrastructure. In a related study Norris et al., (2003) reveal that appropriate access to technology infrastructure is another key factor in the effective technology implementation process. The study reveals substantive correlation between technology access and use. In another study, Yildrim (2007) revealed, teachers agreed that access to World Space Radio (WSR) complementing infrastructure like network boosters, power and radio sets and other ICT infrastructure is one of the effective means to integrate WSR in classrooms. The study helped in identifying other complementing infrastructure in Rangwe division and established the development of the geographical infrastructure of the region.

In some African countries, there are areas with poor radio signal reception because of undeveloped infrastructure. In Oyoo state in Nigeria the radio signal reception had been very poor (Nzioka, 1981). The ministry of education in Oyoo had full knowledge of poor signal reception being received but made no efforts to alleviate the problem. This kind of attitude found its roots to the lower school levels. Nzioka says that teachers and learners were not finding the technological innovation much exciting and valuable. According to McQuail (2005) the audiences are nowadays active and they select what to listen. When the audiences are being deprived of their satisfactions through poor signal receptions in one medium, they look for an alternative media where their needs can be granted. Through the study, the researcher was able to analyze the steps KICD was taking in order to gratify the interest of their target audience.

According to Glass (2005) and Balanskat et al. (2006) teachers are more likely to integrate ICTs into classrooms if they have access to adequate equipment and a solid technology structure. In some areas the physical locations of technology like radio will act as a barrier to teachers in adopting the technology. When the radio signal receptions in schools are very poor, no teacher will bother to use the radio sets for live interactive radio lessons in classrooms (Vijay, 2006; Tina, 2004). In Africa some schools lack proper radio signal distributions due to low signal strengths making it difficult to use radio for learning in those schools (Vijay, 2006).

Some of the recent and reliable surveys agreed that radio is still the dominant mass-medium in Africa, with the widest geographical reach and the highest audience attractions compared with TV, newspapers and other ICTs (BBC WST, 2006; RIA, 2005). Radio broadcasts to schools in Kenya has seen two different broadcast stations. The broadcast stations have been KBC and World Space Radio with varied geographical scope (KIE, 2008). World Space Radio receivers were using satellite with wider coverage for transmissions than KBC, even though World Space Radio was a very expensive venture (Odera, 2010; KIE, 2001; Wambaria, 2003).

According to KIE (2001) pilot study report of World Space broadcast to schools, it was noted that the World Space antennae was taking time to pick the signals which the majority of the audience felt was not easy to tune. The antennae required long aerial extension cables to able to easily permanently install them. Poor visibility experienced by the signal receptions due to obstructions by tall trees, buildings and valleys in some regions was cited as one of the hindrances affecting receptions in some schools within those regions. Another problem which was identified was the movement of the antennae from one location to another as the radio programmes were going on. This was time consuming, cumbersome and making the antennae prone to damages.

However, according to Odero (2010) the World Space Radio digital satellite signal meant no fading, noise or interference. The system delivers crystal clear digital quality sound in a coverage area of 14 million square Kilometers. As long as you are in line of sight with the satellite, you

will never miss the World Space Radio high quality sound (Odero, 2010). This supported the argument by KIE (2005), but had a contradiction where there are barriers in the line of sight at it was also found out in the KIE report. The contradiction was due to lack of putting external factors like tall buildings and trees in to consideration among other factors. In the monitoring of schools broadcasts through World Space in primary schools in Kenya which was done by KIE (2005) covering 10 districts where 6 former provinces were purposively sampled bringing the total number of schools sampled to 100, majority of the respondents were having World Space radio receivers. The respondents were 48 headteachers, 53 teachers and 103 primary pupils.

According to the case study research work which was done within Thika municipality by Wambaria (2003) on the constraints in the use of radio programmes in primary schools in Kenya, she found out that the quality of reception of the World Space receivers were good where students and learners were able to operate them. Among the 120 teachers and 200 learners interviewed which translated to 75% and 76% respectively, they indicated that they were not able to receive the broadcast signals. They attributed this to their inability to operate the radio antennas properly to receive the signals. Only 20.8% of the teachers and 48% of the learners interviewed agreed that the radio receptions were good in their schools. Those who agreed that the receptions were good in their schools improvised the length of the aerials with extension cables so that they could permanently install the antennas. This confirmed the findings of monitoring which was done by KIE, (2005) that found out that for there to be good radio signal receptions, the antennas of the World Space radio receivers had to be improvised. There should be more improved broadcasting infrastructure to make sure that the radio broadcast to schools programmes are received in all parts of the country when public broadcast station like KBC or any other station is being used. The provision of an educational channel provided for under the communication policy of Kenya Information and Communication Amendment Act, 2013 catering for schools broadcasts should be put in place and properly managed, especially during this digital broadcast era (MOEST, 2008).

In another monitoring and evaluation of schools broadcasts through KBC in primary schools done by KIE (2008), it was reported that KBC signal was being received clearly. The monitoring

was carried out in 14 districts in the then 8 provinces and it was clear that 87% primary schools sampled were receiving good radio signals apart from few schools which were improvising the antennas to enhance the signal reception strengths.

According to Dorcas et al. (2014), they found out that an overwhelming majority of the respondents who were 96% agreed that the KBC radio signal was clearly being received by schools in Tharaka North division. The geographical location of the division is generally on a mountain terrain making radio waves to be received very clearly apart from some areas which are on the rare valleys in the region. The valley regions were coupled with poor signal receptions making schools in those regions not to be able to receive clear radio signals. The report had limitations in shading more light on any information coming from technicians or engineers from KBC station, given that the station was and still is a signal distributor. There was lack of feedback from the station on the radio signal strengths in the region as other parts of the region were not able to receive good radio signals. KBC response was vital in ensuring that the report was balanced and whether there were some work being done towards the improvement of radio signal strengths in the affected areas according to the study. The information from the report was inadequate in addressing what signal distributor was doing about the situation and whether they were aware of such kind of challenges existing in Tharaka North division. Due to the lack of empirical evidence on the side of KBC in the previous research, this research was able to get relevant information on the infrastructural development of KBC in Rangwe division, Homa Bay county, from the technicians/ engineers of KBC radio station.

2.1.3 Educational Hardware and Software

There is need for schools to acquire radio sets, cassette players and recorders and DVD players since the radio lessons prepared by KICD are transmitted through KBC English radio channel. Having a functional radio set as one of the hardware tools is a prerequisite for accessing live transmissions of radio broadcast to schools programmes. The radio lessons are also made available or packaged on tapes, CDs and even DVDs formats. Media and Extension Services (MES), a department in KICD which is charged with the productions and transmissions of both radio and TV educational programmes normally packages the programmes on CDs, DVDs and

audio tapes. The programmes are disseminated through the outreach programmes and sold to clients at a fee (KIE, 2005; Edwin, 2007).

Learners learn effectively from any medium if it is used properly with available learning materials. Radio is economical to use and supports the production of educational support programmes which are prepared, recorded and used as many times as required. It is making repeats to be cheap and possible (Rashid, 2010). Research shows that adopting and using ICT in schools leads to significant expansion of education and pedagogical outcome which are beneficial to both teachers and learners (Mingaine, 2003). According to Sharma (2003) radio is one of the various kinds of ICT products available, having relevance to the education sector. It brings accessibility closer to its audiences. In radio, services such as audio conferencing, radio lessons, radio broadcasts, interactive radio lessons, interactive voice response system, audiocassettes and CD ROMs among others have been used in education for different purposes (Sanyal, 2001; Bhattacharya & Sharma, 2007). The radio programmes are listened to anywhere even in homes making them more available, accessible and convenient. The radio programmes are used as complete teaching courses, or integrated into face-to-face teaching courses, or used in conjunction with distance education courses (Mishra, 2005).

Schools with large number of pupils in classes find it difficult to use radio as a mode of instruction to learners due to lack of concentration by learners and its audibility. Some of the pupils who are far away from the radio sets are not able to hear properly and follow the instructions of the radio teacher (UNESCO, 2008). Schools with double streams having one radio set are finding learning to be difficult and not enjoyable. It is evident that in a classroom of more than 100 pupils listening to a radio lesson, many will not take the lessons seriously (Bosch. 2004). There is lack of concentration among the learners making the radio programmes to be poorly utilized. Such a congested classroom is not good for radio lessons and something needs to be done to accommodate all learners (Onyango, 1982).

Radio as a communication tool is portable and flexible. With the introduction of transistorized radios, the sets are easily transportable. It overcomes the barriers of space and time and has an emotional impact by bringing dramatic feelings to the listeners. It reaches a wide range of audiences over a wide distant according to the power strength of the radio system. Other media such as television, computers and mobile phones are now available to even low income persons in developing countries. However, their high costs in affordability and the technical know- how in operations especially computers compared to radio sets still leave radio to dominate. Emerging media platforms are employing the technology in education which was developed by radio. Radio sets are readily available and reasonably cheap even for those schools in the rural parts of the country. According to Schramm (1977) there are big differences in cost among the media tools. Computer assisted instructions cost 10 to 50 times as much as instructional television, which itself costs 3 to 10 times as much as instructional radio.

According to Grise et al. (1974), most developing nations have broadcast capabilities to cover their geographical regions and the main technological challenge is the absence of receivers or radio sets for all people. They contributed this challenge to some governments having restrictions on the importation of radio sets or transistors for use by the populace. However, this kind of governance and control of information has changed in most countries. The technological development in the world has opened democratic space, making the world a global village.

More than two-third of the rural households are not active listeners in Ethiopia simply because they do not have radio receivers at their homes (Jemal, 2013). The dearth of radio receivers were therefore one of the major impediments in the use of radio broadcast for development in Ethiopia. Due to this, such media scenarios would likely create a huge disparity between the rural people and the urban elite. White (2008, Pg. 11) asserts “There is a huge communication gap between the modernized elite sector and the vast majority who live in peasant farming, the informal economy is on the verge of survival.” According to Mohammed (2013), he posits that it would be good to supply radio sets that work with solar power and winding up as most areas of sub Saharan continent lacked electricity power.

Integrating technology into curricula with the intent of positively influencing teaching and learning has been in a state of evolution driven by software and hardware evolution since the inventions of instructional technologies like radios, TV and computers (Dias & Atkinson, 2001). According to previous research studies carried out in the UK (Capron, 1987; Moses & Croll,1991; Chaot & Griffin, 1989) highlighted some of the reasons why teachers preferred the use of radio broadcast to schools programmes. Teachers were using radio broadcast to schools programmes in their teachings because they were good for the development of knowledge, skills and concepts, bringing additional expertise and teaching ideas, presenting information in an interesting and stimulating way, giving access to experiences not easily provided by teachers and introducing, extending and reinforcing areas of learning. Moreover, in UK accessibility and use of radio for broadcast to schools was found to be higher as compared to Africa where the technology is currently still developing. The acceptability of radio broadcasts to schools by teachers and schools administrations was also higher as compared to those countries which were using Interactive Radio Lessons (IRLs) in Africa.

According to KIE, (2008) monitoring report on the broadcast to schools through KBC, it was found out that in some schools radio sets were available but most of them were not functional. According to Dorcas et al., (2014) the school administrations have the responsibilities to ensuring that there are functional radios in schools and other learning materials like time tables, teachers' guides. School administrations should encourage teachers to actively support and use Interactive Radio Lessons (IRLs) during their class lessons and organize for repair, safety and availability of power source for the radio sets. In this carried out research, the researcher was interested in knowing what headteachers were doing in encouraging teachers and learners to use radio broadcast to schools programmes during their teaching and learning sessions.

According to Abuli, et al (2013), 50% of the sampled schools in Vihiga County, Western region lacked functional radio sets for listening to the Interactive Radio Lessons (IRLs) despite the high availability of mains electricity power in primary schools, clearly hampering the extensive use of radios in the schools. Only 8% of the schools sampled were using radio sets in Vihiga county. The study sampled 20 schools representing 32% of the population. The respondents were 20

headteachers, 60 science teachers and 1000 form three students. The report further noted lack of technical know-how on the side of teachers on the use of radio broadcasts programmes in their classes and on technical details concerning tuning the radio receivers. Headteachers did not know how to organize radio listening in their schools. However, the researchers did not come out clearly on the reasons why the schools in Vihiga county lacked functional radio sets in their conclusions. The flaw was substantive as the percentage of the schools lacking functional radio was half the population sampled.

In reality, educational hardware goes hand in hand with its software. There is no way the discussion in the hardware can fail to give some information about the software part. This is not exceptional with the radio broadcast to schools programme in Kenya and around the world in general. Kenya Institute of Curriculum Development (KICD) develops quality curriculum and curriculum support materials for learners in primary, secondary and tertiary levels of education apart from the university levels. The support materials in the Media department are the radio lessons and some other electronic learning materials which are supposed to supplement on what the teachers are teaching learners in schools. Other materials are teachers' guides and broadcast time tables amongst other educational materials which are used by teachers and learners to facilitate learning in schools (KICD, 2013). These are software support materials which are developed by KICD for learning purposes.

According to KIE (2002) pilot study report on the broadcasts to schools through World Space Satellite, it was found out that even though the content is relevant, it lacked support of the teachers' guides. An evaluation carried out on the effectiveness of Radio programmes in teaching English language in Kenya found out that only 18% of the 50 teachers got teachers guides in time for proper planning of their work, while 82% of teachers either got the teachers guides late or never got them at all (Onganga, 1982). This study was able to identify whether teachers in Rangwe division were able to receive broadcasts time tables in time in order to plan for their lessons in class. In Oyoo state in Nigeria teachers complain of lack of prompt distribution of educational broadcast time tables making it hard for even teachers to schedule the radio programmes in the schools' time tables (Nzioka, 1981).

A study which was carried out in Tharaka North Division on the factors affecting use of radio broadcast to schools confirmed the same findings other researchers such as KIE (2001), Abuli et al. (2013) and Odera (2010) came out with, showing that lesson support materials were lacking, making scheming for the radio programmes by majority of the teachers a real challenge (Dorcas et al. 2014). In some of the schools the support materials necessary for the scheming of the radio lessons were never received (Odera, 2010). 38.7% of the respondents who were teachers lacked radio support materials. The research randomly sampled 6 primary schools in which 12 class teachers, and classes 7 and 8 learners were purposively sampled. Even though the researchers found out the there was lack of support materials necessary for scheming of the radio lessons like the teachers guides and the broadcast time tables in schools, they never found out or give out their accounts on what necessitated this in their research work.

While broadcast time tables being produced by KICD are distributed for free in public and also private primary schools in Kenya annually, teachers' guides are to be bought by schools at a reasonable fee. Schools are also able to access and download the broadcasts time tables through the KICD website; www.kie.ace.com. Lack of these support materials are a stumbling block for the proper use of Interactive Radio Lessons (IRLs) by teachers. This brings poor utilization of the radio programmes in schools teaching methods owing to the fact that teachers could opt to use radio lessons without scheming for those lessons as is required of them, disrupting the learning process.

According to Abul Washington and Florence Odera (2013) there were also lack of pamphlets and visual aids in the schools, apart from the resource materials which were discovered lacking by Dorcas, et al (2004). According to Butcher, N. (2003), the body responsible for the running of the technology should have the end users at the back of the mind in the adoption process. Butcher says:

> Those deciding to use technologies to support education need to understand the nature of the communication between educators and learners in order to seek ways to support and enhance these processes (Pg.29).

Lack of availability of pamphlets and visual aids in schools were also discovered by KIE (2008) in their monitoring report. In that report there were challenges including the inefficient support mechanisms in the implementation process. The study sampled 14 districts in Kenya, 50 primary schools, 43 headteachers in those primary schools, 113 teachers and 118 learners.

Emile and John (1980) observed that the educational radio broadcasts greatly boosted education especially in Europe which lacked enough trained teachers and also had insufficient teaching and learning resources. Sydney (1974) observed that radio lessons targeted primary and secondary school learners and teacher training colleges. Schools received teachers' guides and course pamphlets for lesson preparation free of charge. Leaders in Mandera expressed concern over dismal performance and blamed it on inadequate number of teachers and lack of learning facilities (Barasa, 2013). They also noted that most teachers from outside the county declined deployment to Mandera due to harsh conditions and insecurity caused by terrorists attacks which had claimed many innocent lives (Daily Nation Newspaper, 22nd November, 2014).

According to KIE, (2005) few teachers incorporated the radio programmes in their lesson plans while most of the headteachers were using their radio sets without incorporating the programmes in the lesson plans due to lack of broadcast time tables. This was attributed to lack of awareness and prompt distribution of broadcast time tables by KICD, formally KIE. The research had got limitations in the selections of the sampled schools. Its sample was subjective restricting it to those schools which had received the World Space Radio receivers, excluding even the private schools.

According to the research which was carried out by Wambaria (2003) on World Space radio broadcasts to schools in Thika municipality, she found out the broadcast content was relevant despite the content lacking support of teachers' guides for scheming purposes by the teachers. For the schools to be able to schedule their radio programme lessons in different classes, the broadcast time tables should be released well in advance and distributed to schools so that teachers are able to incorporate the radio broadcasts lessons in their schools' time tables. The

time schedule for each of the radio lessons in both primary and secondary schools is about 20 minutes long (see KICD schools broadcast time table in Appendix M). 85% of teachers who used radio lessons in teachings indicated that the broadcast time tables came on time while the rest of the teachers indicated that the time tables came late and sometimes were missing completely. Only 24% of the 120 teachers who were interviewed indicated that the radio broadcast lessons were accommodated on the schools' time tables while the remaining 76% said that the lessons were not accommodated on the schools' time tables. They cited lack of receiving radio broadcast time tables in time so as to be able to incorporate the radio lessons in the schools' time tables for the smooth running of the broadcast lessons devoid of any time clash. The teachers suggested that the radio lessons to be following the syllabuses and the schemes of work used by teachers.

2.1.4 Topography of the Region

Homa Bay County where Rangwe division is situated has varied topographical features of plains, valleys and hills with uneven radio signal distribution strengths. This therefore, calls for the need to check the radio signal reception patterns of the region to ascertain the clarity of the radio signal receptions within the schools in Rangwe division, for the smooth access and use of radio broadcast to schools programme.

Radio is universal with wider signal coverage. Radio signal is transmitted through FM (Frequency modulation), Medium Wave and Short Wave spectrums. The signal can also be transmitted via satellite like the World Space Radio. Generally, most radio caption mode is FM because its signal reception is the best even in bad terrains (Kumar, 2007). This is because its signal is modulated even in those bad geographical terrains to yield good results. However, in other geographical areas they experience transmitter coverage problem (Selinger, M., 2009). According to Abul et al. (2008) the quality of signal reception in some regions is poor due to lack of visibility and far distance from the transmitters. This makes the accessibility of radio broadcasts to schools not to be uniformly distributed during live transmissions leading to inequality in providing services like the instructional education and entertainments.

KBC, like any other telecommunication installations in Kenya faces uneven terrain obstacles in setting up remote radio and television stations. The geographical locations in Kenya are not uniform. The geographical locations in Kenya are composed of hills, valleys and plains making the strength and penetration of transmitted signals to be uneven. Another factor that also affects the signal transmission is obstructions from tall buildings in the line-of- site. All these make the achievement of line-of-site which is 360 degrees around any transmitter very hard even with the abundant of high altitudes areas spreading out in various locations as ideal areas for transmitter installation sites. Some low altitude areas still have very poor signal reception quality. To be able to rectify this, it requires that multiple booster stations are erected in every other few kilometers to fill the transmission gaps (Njeru, 2005).

According to Jemal (2013), the average reception coverage for most of the regional state radio broadcasters was not covering the whole country of Ethiopia. This meant that most of the respective towns and rural areas in Ethiopia were yet out of their reach. This limited coverage, unquestionably became a reason for the exclusion of the rural folks who were usually the majority and deserving to be served.

According to Odera et al. (2005), the government of Kenya in 2003 embarked on transmitting radio broadcast to schools programme through the World Space Radio. It was a form of electronic media using satellite technology to broadcast directly to people across the globe. For many years radio programme have been used in Kenyan schools for distant learning with full support of the Kenyan government. However, in 1995, schools broadcast was discontinued due to the high cost of radio production and transmission problems which were being faced by the government. The transmission challenges made the Kenyan government in 2003 to decide on the use of World Space Radio (WSR) to transmit radio broadcast to schools programme. This was due to the ability of the transmission to have a wider clear line-of-site signal reach as the radio signal was being beamed through the satellite and received by the Afristar satellite receivers (KIE, 2005).

World Space Radio was the first to create multimedia education programmes via satellite radio in Kenya. The aim of World Space Radio was to broadcast on the African learning channel with an actual audience reach of six million people with education and information on critical subjects such as HIV/AIDS, along with well-structured programmes for women on micro-enterprise. The World Space Radio digital satellite signal quality has no fading levels, noise or interference whatsoever. The system delivers crystal clear digital quality sound in a coverage radius of 14 million square Kilometers. As long as you are in line of sight with the satellite, you will never miss to receive the World Space Radio high quality sound (Odera et al., 2005).

However, World Space Radio came with its own challenges which made the government to resume radio broadcast to schools programme through KBC radio English channel. In 2007 the government through KICD in consultation with the Ministry of Education and KBC, revived the radio broadcast to schools programme through the national broadcaster English channel. The revival followed the lack of World Space to meet some of the requirements which were put forth for equitable access to radio broadcast to schools lessons in all schools in Kenya. The radio broadcast to schools was not reaching all the intended schools in Kenya due to the World Space hardware issues. The World Space radio receivers had not yet been distributed to 30,000 schools as it was planned. The maintenance cost was also expensive to schools as the radio receivers were running on batteries. There was also technological challenge which was being experienced by teachers regarding the operations of the World Space radio receivers. The teachers lacked technical know- how in the operations of the receivers (Dorcah et al., 2014). Transmitting radio broadcast to schools lessons through World Space radio at long run became more expensive than it was through KBC radio (KIE, 2008).

According to Wambaria (2003) in her study on constraints in the use of radio programmes in primary schools in Kenya; a case study of Thika municipality, she found out that the quality of reception of the World Space receivers were poor due to the geographical location of Thika region. Thika region is a cosmopolitan town with tall buildings and surrounded with mountains and hills making some part of it to be out of sight with World Space satellite transmissions. This made the students and learners to use the improvised antennas in order to boost the radio signal

receptions. Only 20.8% of the teachers and 48% of the learners interviewed agreed that the reception was good in their schools. Those who agreed that the reception was good in their schools improvised the length of the aerials with extension cables so that they could permanently install the antennas which confirmed the findings of KIE, (2005). There should be more improved broadcasting infrastructure to make sure that the radio broadcast to schools programmes signal reaches all parts of the country if public broadcast station like KBC is to be used. The provision of an educational channel provided for under the communication policy of Kenya Information and Communication Amendment Act, 2013 to cater for schools broadcasting should be put in place especially during this digital broadcast era (MOEST, 2008).

According to the study by Dorcah et al. (2014), the majority of the respondents (96%) overwhelmingly agreed that the radio signal was clear and audible. They attributed this to partly the geographical location of the area under study as Tharaka North division is generally located on a mountainous terrain there by making the radio waves to be received well in the region. However a few schools which are located on the rare valleys in the region had poor radio signal qualities and the radio sounds were not clear due to poor visibility from the KBC transmitter stations.

2.1.5 Technical Know-how

According to Becta (2004) technological challenges were classified in to: school level barriers such as lack of time, resources, effective training, technical support; and teacher level barrier such as lack of time, confidence, resistance to change, no perception benefits and lack of resources. Bengimlas (2009) also classified these barriers into teacher and school levels barriers. They included lack of access, resistance to change, lack of time, training, and technical support.

Makewa et al. (2013) asserted that school administration was a key determinant for the realization of desired outcomes and success in both public and private schools. They concurred with Gray and Smith (2007) that the main education managers in the schools in the 21st Century encountered myriad forces originating from technology related experiences. Andrew Moemeka

noted that the teachers' attitudes in Nigeria inhibited the effective use of instructional radio. Teachers who are supposed to guide learners in their classrooms as they listen to live radio broadcast lessons were not trained to do so. They were seeing the use of radio in learning as a major challenge to them. This made them to develop negative attitudes towards the use of radio which they also saw as a waste of time and money.

According to Ramothea, L. (1982) on a study of assessment of the effectiveness of the schools education broadcast in Lesotho Junior Secondary School, he said that producers of the radio broadcast programmes should be able to ask the teachers to select and suggest the topics to be included in the radio broadcasts so as to be able to tackle topics or areas in which teachers generally have problems. This participatory approach would enable teachers to embrace the technology with immense benefits as they feel part and parcel of it. This view is difficult to implement in Kenya because; first, teachers are many and their views will be varied and trying to satisfy their needs will be a hard task to meet. But, it is a method worth emulating in KICD radio broadcast to schools programme. Secondly, it will not be orderly as each and every teacher will be requesting different learning lessons at the same time. Finally this will be time consuming and can turn out to be expensive at long run in Kenya. However, there should be a feedback channel put in place to be able to get the views of the learners and teacher to help in enriching the programmes and the audiences to feel part and parcel of the programme.

According to Wambutta (1992) in the study on problems encountered in teaching Home Science to primary schools' pupils in Langata division in Kenya through radio broadcast, it was evident that 86% of the lessons were not supervised by the teachers. Teachers were only taking the radio sets in the classrooms and then leaving them there with learners to learn on their own. This was not productive, effective and helpful to both the learners and teachers. In this research, the researcher was to observe any live Interactive Radio Lesson (IRL) taking place in class with a teacher.

According to Nzioka, G. (1981) on factors affecting learning in Nigeria, none of the schools visited were using radio. This was being attributed to lack of interest among teachers and the officers of the Ministry of Education who were concerned with the radio broadcast to schools programme. The lack of interest on the side of teachers was being contributed by the inability of the ministry to supply much needed support materials to the schools, failure of them to inform schools about the available facilities such as tape copying services and failure to involve teachers in deciding topics to be taught through radio live broadcast.

Nzioka (1991) noted that if top leadership both at the ministry level and the school level are not committed to the success of radio broadcast to schools' programmes, it will be difficult for the teachers who sit in classrooms with pupils to feel motivated to use the educational radio programmes. It is therefore important to investigate and establish the effect of ICT use in the secondary schools to ascertain the extent to which ICT affects educational performance and standards management.

The current movement towards putting the latest technology into classrooms is causing educators to re-examine the programmes, the policies and the impact of ICT on teaching and learning (Whitchead et al, 2013). In fact ICT application in the schools is part of the action plan for modernizing educational management as well as getting towards electronic government [e-government] and electronic learning [e-learning] (MOEST, 2005). The innovations are not just mere aesthetics but are meant to establish workable and recognizable performance and achieve good standards, scoring the objectives of the government of Kenya in rolling out radio broadcast programme.

According to Dhanarajan (1998) some of the schools heads in Oyoo state in Nigeria are not encouraging the use of radio broadcast lessons in their schools blaming it on the poor performance by the branch of the Ministry of Education charged with running educational programmes. The perceptions and fears of the classroom teachers are the challenges being faced in the use and spread of technology in education instruction system. There are those teachers and

even headteachers who are not able to embrace the new technology due to the fear that the technology comes with it terms of control and lack of knowledge. This makes the perceptions of the users to vary, with majority of teachers developing negative perceptions in the use of radio broadcast to schools programmes and other instructional modes. Some teachers see the radio technology as denying them total control of the teaching and learning environment while others see it as a threat to their jobs making them unhappy with the whole development of technology.

Most teachers do not prepare their lesson plans in line with the radio lessons which are normally following the teachers' guides. An evaluation study which was carried out on effectiveness of radio programmes in teaching English in Kenya by Odera (2013), about 48% of the teachers observed prepared pupils for the radio lessons through introduction while 52% started without introducing the topic. However, in her researcher's findings there was no reason attributed to the observations made. Lack of proper lesson plan makes learners not to be aware of what the teachers are to teach, shifting learners' attentions to other activities apart from learning (Ngonga, 2002; Bett, 2008). The surveys undertaken by Audience Research Unit (ARU) of All India Radio (AIR) from time to time proved that the educational authorities, teachers, pupils were not giving adequate attention to this programme for various reasons such as lack of proper class environment and lack of monitoring or supervisions by the relevant authorities (J. K. Das, 2008).

According to Dorcas et al. (2014) in her research report she found out that the school administrations were not supporting the radio broadcast to schools being aired by KICD through KBC English service, despite the radio signal receptions in the region being clear. A study on the role of classroom teacher in using Swahili language Instructional programme found out that although teachers used to make use of radio broadcasts lessons some years back, they decided to drop them since they were always on the air at odd times when their teaching times indicated different lessons as those being aired other than Swahili programmes (Chimerah, 1982).

Other studies carried out in schools in Malaysia found out that successful and effective use of technology enhanced teaching depend heavily on the support, innovativeness and creativity of

the school administrators and teachers (Kumar et al., 2008). Technical support is critical for the successful adoption of technology by teachers which go a long way in making sure that the integration of technology in classrooms is achieved (Deanney & Hennessy, 2007). Lack of technical staff and know-how to assist teachers in their quest to employ technology based pedagogy in teaching and learning is an obstacle towards the use of technology (Pelgrum, 2001).

Teachers play a vital role in the implementation of instructional technology like radio as part of electronic communication media in schools. Teachers attitudes are predictors of the utilization of the technology in an instructional setting (Almusalam, 2001; Al- Zaidiyeen, Mei & Fook, 2010). The perceptions of teachers on the use of technology affect their beliefs about the way the subject content should be taught and whether they are willing to change their styles of teaching (Mumtaz, 2000; Anderson, 2005). Rogers (2005) argues that the diffusion of an innovation is a societal process. The compatibility with the social values, beliefs and past experiences are factors determining the rate of adoption of an innovation. Lack of professional development and integration in terms of use of instructional technology on the side of teachers hinder the use and spread of technology (Li & Ni, 2011). In another study conducted by Chigona and Chigona (2010) on the factors affecting the use of ICT for teaching in Western Cape School, it was found that these were personal, social and environmental factors. Teachers may lack confidence and time to practice on the use of instructional technology (Cuban et al., 2001).

According to Mingaine (2003) adopting and using ICT in schools leads to significant expansion of education and pedagogical outcome which are beneficial to both teachers and students. Teachers have limited time to teach and cover the syllabus. There were positive sets of attitudes for teachers in Britain in the use of radio broadcast to schools programmes as the lessons provided information for teachers and pupils, contributing a lot to learning (Sharp, 1995).

According to mass communication experts, headteachers act as opinion leaders in their schools and should be targeted for diffusion of the use of Interactive Radio Lessons in schools. Due to this teachers were targeted in finding out the roles they play towards the accessibility of radio

broadcast to schools in this research. There should be policies in schools encouraging teachers to use IRLs in conducting their teachings. About 53% of teachers sampled cited lack of school policy on the use of radio as an instruction tool in teaching (Heinich, R. Molenda, M. Russell, J.D. & Smaldino, S. E., 2002). Further, the scope and mode of using radio in schools relied heavily on the teacher (Davies, 2002). The part played and attitude developed by the teacher in the whole exercise helps to determine the effectiveness, efficiency and shapes the manner in which radio broadcasts to schools programmes are used in schools by teachers. He went on to say that it was more poignant as teachers' schemes of work included radio programmes. Teachers were able to incorporate radio programmes in their lesson preparations, some teachers were appointed to be in charge of all media materials and broadcasts programme in the school. Radio lessons are there to supplement what the class teachers are teaching learners and hence the problem with congested syllabus and completing the syllabus in time should not arise (Anzolena, 2008; MOE, 2006).

In a study done by Odera (2010) on teachers' views and attitude on WSR, she found that 75% believed that radio programmes were good and that they were well researched and presented in a stimulating and interesting manner. The majority of teachers supported the use of radio programmes and acknowledged the benefits of broadcasts lessons. Some indicated that World Space Radio helped in improving their classroom presentations and helped them in tackling difficult topics. About 89% gave positive response about using radio to improve teaching methods and students learning. Most of the participants reported of students learning from radio programmes. A Kiswahili teacher reported that using radio helped to improve Kiswahili language. The teacher said that in his class, a learner came to the school and she was not able to speak in Kiswahili language because she did not know the language, but since they started using radio programmes the lady was able to express herself very well in Kiswahili.

According to Abuli, et al. (2013) in Vihiga county, there were frequent power blackouts which could call for schools to have power backups such as use of dry cells or lead- acid batteries as solutions to the problem. Frequent lightening was also found to be problem which could only be solved by schools purchasing radio programmes on CDS and tapes from KICD to be able to play

back those programmes to learners in their classrooms. The report had limitations on any information from KICD regarding how they were managing their radio broadcast programmes and the challenges they were facing. The research was be able to monitor the level of government commitment in providing schools with electricity power.

According to Wambaria (2003) the success on the use of World Space receivers to air education radio programmes to schools relied on the technical know-how of the users who were the teachers and learners on how to operate the receivers. Majority of the respondents 75% and 87.5% who were teachers and learners respectively indicated that they were not able to operate the receivers, while 25% of teachers and 12.5% of learners indicated they were able to operate the World Space receivers after a long time of struggle. Majority of the respondents who could not operate the receivers cited lack of knowledge due to no in-service training which was organized for them by KICD despite the indictment of the headteachers in those schools by the Institute. The operation manuals for the receivers were very complicated for teachers hence they could not use the receivers in their schools to conduct live radio schools broadcast lessons. They suggested that the then KIE which is now KICD to provide technical staff to assist in the operations of the radio receivers, In- Service training to be offered and more simplified operation manual to be provided in schools. They also suggested for a provision of user friendly antennae and if possible to be able to receive the radio broadcast to schools programmes through an ordinary radio instead of specialized World Space receivers.

Wambari (2003) noted that the implementers who are the teachers should be involved deeply in most processes taking place in the productions of the radio broadcast to schools programmes. The engagement helps in gaining acceptance of the radio broadcast programmes by the teachers. 90% of the producers who were interviewed on whether they involved teachers in their productions agreed that they involved teachers in writing, editing and voicing of the programmes. In actual sense teachers and other experts were involved in every stage of the productions of the radio broadcast to schools programmes which is a requirement by KICD in the development of radio broadcast to schools programme (KIE strategic plan 2006- 2010).

Most radio projects rely on the government good will. This is a political will in the sense that in a democratic society, governments change and change in one might be an impediment to the ongoing programme if the incoming government priority in terms of education is shifted and neglect the ongoing project like the radio broadcast to schools programme. Persson and Tabellini (2000) predicted that lack of political credibility suppresses public good provisions. Scheduling of the radio lessons is another challenge facing radio broadcast to schools programme.

In Africa some schools lack proper funding towards the use of radio broadcast to schools programmes, becoming detrimental especially to schools in rural areas. Rural schools also suffer from insufficient building space, poor security and enough trained staff (Gesci, 2013). The financial implications and relatively low value of radio as compared to television are concerns for the use of interactive radio lessons in developing countries Bates (1984). Radio sets operate on low power and on low cost batteries. Radio should be used as a medium of choice in developing countries where an electronic teaching and learning medium is to be used. Producing and transmitting radio programmes is an uphill task with a lot of financial implications involved for its smooth running. Self-financing projects spend most of the time fundraising and their success depend on the financiers. Public financing projects have to wait for their respective budgets to be approved by relevant governments the money to be allocated to those projects.

Leaders and managers in the government as well as schools are instrumental in the use of technology in education (Republic of Kenya, 2009). Studies have shown that most projects that succeed are being supported by dedicated champions who provide visionary leadership with good leadership skills (Tina, 2004; Luck & Peng, 2010). Bayor and Ritchie (2002) described leadership as a critical predictor of any technological integration. The headteachers in primary schools have equally displayed lack of interest in the educational radio broadcast programmes and their sense of responsibility stands to be questioned. The research was able to find out the commitments of headteachers in the implementation process of the radio broadcast to schools programme. It is not in good taste to hear schools heads argue that they do not have money to radio set. Those with radio sets say that they do not have money to buy batteries or dry cells to be used by the radio sets. Some utterly say that in their schools there is no electricity power. The

schools are not connected to the mains electricity power so they cannot be able to use the radio sets in classrooms. Others were decrying the lack of security in schools making them to take the radio sets to their home making them to rarely use them in schools (KIE, 2008; Abuli et al., 2013).

In Zambia during the time the country's economy was down, the pupils could not get access to education due to lack of government support (Kelly, 1991).The government of Kenya is currently rolling a power programme in all schools. Each and every school in Kenya is to be connected to the power grid given the fact that laptops are to be provided in public primary schools.

According to Wambaria (2003) there were lack of funds to conduct monitoring and evaluation by then KIE to get the feedbacks from the fields and be able to act on the recommendations in order to boost the accessibility of the radio broadcast to schools programmes in primary schools in Kenya. This was due to government bureaucratic process in the approval of the budget which was taking long leading to loss of time and money. The allocation from the exchequer was also very little as compared to amount of radio programmes lined up to be produced yearly. This was evident when the then KIE could not be able to pay for the airtime of the radio broadcast to schools programmes through KBC which led to its discontinuity in 1995 (KIE, 2005). The government of Kenya should be able to increase the budgetary allocation for KICD to be able to run their programmes effectively and efficiently.

2.1.6 Awareness and Adaptability

In Britain the level of accessibility of radio broadcast to school is higher as compared to Kenya and other African countries. This is due to the high level of awareness of radio broadcast to schools (Bates, 1995). A research carried out in the British Open University found out that the schools were aware of the programmes to the fact that listening to them was not an option but a routine in accordance with their policy frame work (Grundin, 1981; Bates, 1995). In the survey

which was done by UNESCO, educational programmes occupied about 20% of the broadcast fare on radios in selected countries of the developed world (World Communication report, 1989).

In a study which was conducted by Wellington and Odera (2013) in Kenya on the impact of chemistry school radio broadcast in secondary schools in Vihiga County of Western Kenya, it was realized that there was lack of access and use of Interactive Radio Lessons aired through KBC due to lack of awareness in schools. They noted that schools needed to be sensitized by the relevant authorities through organizing workshops and other ways to help in the rapid diffusion of the radio broadcast to schools programme. Despite the numerous monitoring activities which had been carried out by KICD, There were no workshops organized by the Institute to sensitize the radio consumers (KIE, 2005; KIE, 2008). Kemmerer (1990) and Mayo (1990) stressed on the need of third world countries educators to be exposed and be made aware to new and exemplary educational programmes and formats to be used in Interactive Radio Lessons (IRLs) for proper utilization of the programmes.

Lack of adequate publicity about the use of radio broadcast to schools hamper proper utilization of the Interactive Radio Lessons (Bosch, 2004). Those who suffer most from this lack publicity leading to low use are the learners who are in this case the target audience. According to McQuail (2005) creating awareness is important in attracting more of your target audiences. Rogers (2005) says that for a technology to be adopted by many, creating awareness is very key in its adoption success.

According to KIE (2008) monitoring report, it indicated that the target audiences of the programmes who were learners had lesser percentage in listening to the radio programmes compared to teachers and headteachers who were 97% and 91% respectively while learners were 81%. This was contributed to lack of awareness on how to use the programmes effectively in class by teachers and their benefits. 22% of the teachers sampled stated that the programmes were not good enough while 88% agreed they were good. The study sampled 14 districts in Kenya, 50 primary schools, 43 headteachers in primary schools, 113 teachers, and 118 learners. On the effective implementations of the radio programmes, the report found out that the radio programmes were highly effective which was confirmed by the findings of other subsequent works done by Washington et al., (2013) and Dorcas, et al., (2014). The monitoring report

although sampled 14 districts, it did not include Homa Bay district which is currently Homa Bay County where Rangwe division is situated. This is the gap that the study fulfilled as some of the variables which were under consideration in the previous study were related with this study.

The study by Odera et al. (2013) established that the approach which was being used by KICD to use District Education Officers in sensitizing headteachers in the use of radio broadcast to schools by attending workshops organized by these officers was not effective as the information did not reach the intended headteachers if at all workshops were organized. Majority of the headteachers who responded, 50% concur with the importance of IRLs and they said the lessons were useful in teaching pupils as they were thoroughly prepared while 58% of the teachers thought otherwise. Teachers contributed the lack of use of radio broadcast to schools programmes to the lack of teaching resources, high operation cost, lack of visualization of the programmes and lack of students' participations in asking questions directly. The study sampled 20 schools, representing 32% of the population. In the report of Odera et al. (2013), the authors relied on their personal assumptions instead of empirical data when they established the approach which was being used by KICD to sensitize headteachers through attending workshops organized by CEOs without proper empirical data. The report sounded invalid when they concluded by saying "the method was not effective as the information did not reach the intended headteachers if at all workshops were organized". They were not sure whether workshops were organized or not due to lack of evidence to support the conclusion.

Banerjee et al. (2010) posits that other research on the role of information from sources other than media focused on intensive grassroots information campaigns, showing mixed effects. They said these campaigns alone had no impact on learning in public schools in India. But when the campaigns were combined with efforts to organize volunteers to hold remedial classes outside the public school system, there were gains in literacy which were large. According to Pandey et al. (2009) looking at similar information-only campaigns, there were reductions in teacher absenteeism, but little impact on learning outcomes. While there has been follow-ups done by KICD with little improvement, there should be new methodology adoptions to create awareness in the use of Interactive Radio Lessons.

In the research done by Andrabi et al. (2008), looking at Pakistan, by far the largest effects of increasing information were on the behavior of private schools, which faced the risk of parents switching to better-performing schools. In contrast, in Uganda an intensive campaign to mobilize communities to improve public health services, in which project representatives not only provided information, but also actively promoted the organization of villagers, led to large improvements in services provided and in health outcomes (Björkman & Svensson, 2009). If the health campaign strategies are incorporated in radio instructional campaigns for radio broadcast to schools programme, the awareness created will be great according to the research which was done by Björkman and Svensson in 2009.

2.2 Theoretical Frame Work

Theories are general statements that summarize our understanding of the way the world operates (Severin, J. & Tankard, W. 2001). According to Steven H. Chaffee (1996) theories are organized set of concepts, explanations, and principles of some aspect of human experience. Communication theory aims at improving our understanding of the process of mass communication so that with better understanding we are guided and able to position ourselves well to predict and control the outcomes of mass communication efforts (Creswell, 2009). This study employed Uses and Gratification Theory as espoused by Katz in 1974 and Instruction Theory by Robert M. Gagne.

2.2.1Uses and Gratification (U&G) Theory

Uses and Gratification (U&G) was propounded by Elihu Katz in 1974. The theory is one of the communication models focusing more on the role played by the media consumers or audiences. It is an audience centered based approach, focusing mainly on what people do with the media. It examines how people use the media and the kind of gratification they seek and receive from the media such as radio and TV among others. Uses and Gratification approach has developed due to lots of critics from scholars. Uses and gratification researchers assume that audience members are aware and can articulate their reasons for consuming various media content. According to McQuail (2005) audiences are a complex mixture of individuals who select media texts and forms that best suit their needs. The Uses and Gratifications Model suggests that media

audiences are active and make active decisions about what they consume in relation to their social and cultural setting and their needs (Blumler & Katz, 1974).

Uses and Gratifications (U&G) approach has its roots in the 1940s when researchers became interested in why people were engaged in various forms of media behavior, such as radio listening or newspaper readings (Wimmer & Dominick, 1994). During this period an approach in communication research was developed to study the gratifications that attract and glue audiences to the kinds of media and the types of contents that satisfy their social and psychological needs (Cantril, 1942). If it could have been in today's world, the researchers could have also considered social media plat forms like Facebook, Tweeter and WhatsApp. According to Dozier and Rice (1984) they credited Uses and Gratification (U&G) perspectives with Schramm's 1949 immediate and delayed reward model of media U&G.

The research done in 1940s to 1970s categorized audience motives and selection patterns in gratifying their needs in to; information, social prestige, escape, daily living, and for a social context (Cantril &Allport, 1935; Herta Herzog, 1944; Waple & Berelson, 1949). The early studies of U&G were primarily descriptive, seeking to classify the responses of audience members into meaningful categories (Klapper, 1960). The early studies had little theoretical coherence. In fact many were inspired by the practical needs of newspaper publishers and radio broadcasters to know the motivations of their audiences in order to serve them more efficiently. Many social and psychological variables that were presumed to be the precursors of different patterns of consumption of gratifications were identified and put in operations (Wimmer & Dominick, 1994). Ruggiero (2000) noted that Klapper in 1963 stressed the importance of analyzing the consequences of use rather than simply labeling the use as was done by the earlier researchers. In 1964 Mendelsohn identified several generalized functions of radio listening such as companionship, bracketing the day, mood changing, provision of useful news and information, participations and social interactions. Other variables like race and class were introduced in audience topology by researchers such as Gerson in 1964, and Greenberg and Dominick in 1969 (Ruggiero, 2000).

The studies conducted during 1960s to 1980s up to date, reflected a paradigm shift from traditional effects model of mass media research to a more functionalist perspective (Ruggiero, 2000). Klapper in 1963 called for a more functional analysis and recognized that the audiences are active not passive as was the case during the previous studies. The views of Klapper were echoed by Geiger and Newhegen in 1993. Palmgreen and Rayburn (1979) underscored the primary task facing media researchers which was to integrate the roles played by gratifications and other factors in to a general theory of media consumption. MacLeod, Bybee and Dural in 1982 put clear the audience satisfaction theoretically by summing up that gratifications sought and gratification received were two different conceptual entities deserving very independent treatment in any further U&G research (Ruggiero, 2000).

Blumler in 1979 suggested that cognitive motivation facilitated information gain and diversion or escape motivation facilitated audience perceptions of the accuracy of social portrayals in entertainment programming. With lots of critics from scholars, the research work done by Katz, Blumler and Goverich among others built on Herzog's research approach causing a paradigm shift from how the media influences people to how audiences use media and create news. This view has reduced the dominance of the limited effects approach to mass media studies. Since 1980s to date, audiences have been considered active and media oriented. They know what they want, have a choice to choose from and even create news. This has made many theories to be developed which are predictive and explanatory by connecting the needs, goals, benefits and consequences of media consumption and use along with individual factors (West & Tunner, 2004).

According to Blumler (1979), media have uses for people and people also put media to those uses. Radio broadcast to schools transmitted through KBC English Channel is an educational utility. Learners at primary, secondary and tertiary levels are the target audiences. The general public is glued to it due to some general learning programmes transmitted during evening hours and even during the schools holidays (See Appendix N). The programme schedules vary depending with the activeness of the audience in relation to the time of the day and the type of contents being aired (McQuail, 2005).

Prior motivations of people determine their rates of consumptions of the media content (Blumler, 1979). When schools, teachers and pupils or learners are well motivated towards the use of radio broadcast to schools programmes prepared by KICD, the degree of spread and sustainability of the listeners will be high. The motivation aspect can come in the input stage as well as the output stage. In the input stage, KICD can decide to distribute freely some of the learning materials to schools and reward those schools making use of the KICD Interactive Radio Lessons (IRLs). Audiences can also be motivated by creating awareness on the use and benefits of the programmes, and the ease with which the clear radio signal is received. This will persuade them to make use of the programmes and see the kind of gratifications that come out of that. If their needs are met and the audiences get satisfied, they will be able to selectively listen to the programmes because of their existing interests and preferences.

Active audiences are able to construct their own meaning from the contents being delivered to them, influencing what they think and do. They can also be able to avoid certain types of media influences (McQuail, 2005). In Homa Bay County the education standards are low with high levels of school dropout rates (KNEC, 2013). The dropout rates have been attributed to poverty and high rates of HIV/AIDS prevalence (UNICEF, 2005). To reverse this trend education must be given priority for change of mindset and lifestyle of the people of the region for better development of the area.

According to McQuail et al. (1972), consumers have various needs that they would like to be satisfied through the media. They use the media for diversion purposes in order to escape from their daily routines or problems. Some use media for personal relationships whereby they are able to substitute media for companionship whereas some for personal identity as they reinforce individual's values. Most audience of radio broadcast to schools seeks media purposely for surveillance. The programmes are educative hence the audiences would be able to seek information to help them accomplish their studies and acquire knowledge.

According to Katz et al. (1973) the needs of audiences are categorized into different groups. There are those audiences seeking media for cognitive aspect. They seek to acquire information and knowledge from the media. Some are for affective which is comprised of emotion, pleasure and feeling. There are those for personal integrative aspect as they seek to enhance their own credibility and status, and others for social integrative aspect as they seek to interact with their families and friends. The last group seeks media for tension release. Either they would like to escape from the reality or divert attention for their own satisfactions. Lull (1991) categorized these categories into two groups. These are: structural covering environment which are background and companionship, and regulative which are punctuating time and talk; and relational covering communication facilitation which is something to talk about, affiliations or avoidance which is something to do together, social learning which are aid in decisions, problems and model, and lastly competence or dominance which is about role aid and authorization.

People always like to access what they want at that particular time. When this state is taken away from them then they are deprived. In 1949 the study that Berelson did when the New Yorkers missed their favorite newspaper triggered off the deprivation approach. He found out that newspapers served more diversionary purposes than cognitive ones. Those interviewed could not point at specific contents missed but could explain how much disoriented they were with what was happening (Emenyeonu, 2005). Kenyans experience media information deprivation in February, 2015 when most favorite media channels were denied the right to air their programmes due to the tussle between them and the Communication Authority of Kenya (CAK) concerning the switchover time from analogue to digital signal (Daily Nation Newspaper, 27th February, 2015). Viewers complained of what they were missing but could not be specific of some contents missed. They were very much disappointed with the government but nothing they could do. According to the Constitution of Kenya (2010) it is unlawful for the government to deny its citizens access to information, going against the freedom of access to information. Radio broadcast to schools programmes are also supposed to be accessed freely by all schools and learners in Kenya (MOEST, 2005). Depriving them of these educative and informative programmes goes against the aim and purpose of the government concerning free education (MOEST, 2005; KICD, 2013; KIE, 2008; Constitution of Kenya, 2010).

Audiences get attracted by some factors and patterns of programme choice to the media of their own choice. They will look for media which can make them meet their satisfactions according to their own wants. These factors are demographic and psychographic, availability of viewers for the programmes they prefer, the viewers' environment and the scheduling pattern of the media (Emenyeonu, 2005). Audiences prefer to select programmes with rich contents according to their preferences for their needs to be satisfied (McQuail, 2005). Relevant content to a particular audience will be able to glue the audience to the kind of the appealing media.

Radio broadcast to schools programmes should be able to appeal to its listeners and their loyalty through their contents and their scheduling patterns. When teachers are able to listen to radio broadcast to schools, it is possible for them to use them in their teaching lessons as they co-listen with their learners. Embracing listening by authorities is an influencing factor in the listening patterns of the programmes by the learners apart from the peer group and other factors. It is necessary for school administrations such as headteachers and teachers to be persuaded to embrace the technology so that it cascades downwards.

According to Schramm and White (1949) when looking at factors influencing readership of newspapers, they found out that readership had positive relation with education, age and social status of a person. According to Jeffer's 1979 on the functions of media behavior, she held contradictive opinion to that of Schramm and white. She found out that education, age, sex and marital status did not appear to have valid indicators of individual media consumption patterns in several media. People from lower social status listen or view less to any media information as some are not able to afford the electronic gadgets. This is why radio broadcast to schools uses radio as a tool due to the cheap radio sets in the market. The government of Kenya is also boosting the listenership by making sure that each and every school in Kenya is connected to electricity power grid (MOEST, 2005).

People get exposed to a medium and get glued when the medium is capable of meeting the gratifications that the person seeks and gets satisfied with the extent to which he or she believes

he or she is receiving it (Palmgreen et al., 1979). There should be a good balance between the gratification sought and the gratification obtained for satisfaction to be realized. For teachers to keep on using radio broadcast in their teachings there is need for their gratification sought to be met. The perception should be created that influences teachers to keep on using the programmes as they realize good outputs like listening to good and quality learning programmes and learners passing well in their examinations. Radio signal reception should be clear such that when the programmes are being listened to the audiences are not let down by poor reception or lack of power, or teaching aids. That will demoralize the teachers and learners as their gratifications sought and gratification obtained are not balanced leading to frustrations. Therefore the broadcasting infrastructure should be properly put in place and where signals are poor they should be boosted.

Uses and Gratification approach is relevant to this study because it has put clearly the objectives of the study and tackled them constructively. It has created the awareness required on how messages or programmes and the medium used, constitute intervening variables in the effects process. U&G is a good framework for the development communicators to look at during dissemination of ideas through the mass media like the Interactive Radio Lessons (IRLs).

2.2.2 Instruction Theory

Instructional theory originated in United States in late 1970s and one of the first instructional theorists was Robert M. Gagne who in 1965 published his research work called "conditions of learning". This was heavily influenced by the work of Benjamin Bloom in 1956. Instructional theory is about the delivery of learning contents to learners through learning objects or physical means. Physical means can be through instructional radio, TV, Internet and mobile phones among others. Learning objects are structured and deliver educational contents to learners in various levels of education. Every physical means of instructional delivery, from the live instructor to the textbook to the computer and so on, would be classified as an instructional medium (Reiser, 2013) .

Prior to the 20th century, the common means of delivering educational instructions were the teacher, chalkboard and the textbook. This delivery method had been categorized differently from other media (Reiser, 2013). Now the instructional media is any physical means other than the teacher, the chalkboard and the textbook through which instructions are presented to learners. A medium that gained a great deal of attention during this period was the radio. By 1930s, radio was being hailed by audiovisual enthusiasts as the medium that was to revolutionize education (Morgan, 1932).

However, up to around 1950s radio use had very little impact on instructional practices in United States and other parts of the world (Cuban, 1986). During the onset of World War II, audiovisual devices were used extensively in the military services and in industry for propaganda war and industrial communication purposes (Saettler, 1990). Radio was being used as a propaganda tool by the Americans and the Germans. There were challenges such as lack of technological know-how among others which were facing the use of audiovisual devices (Finn, 1972). There was renewed interest in using audiovisual devices in the schools after the World War II (Finn, 1972; Olsen & Bass, 1982). According to Mowitt (2011), the experience gained from the wartime in the use of these media fueled their subsequent use in schools in the decades to follow.

Several intensive programs of audiovisual research were undertaken to identify how various features or attributes of audio-visual were to be used for educational purposes (e.g., Carpenter & Greenhill, 1956; Lumsdaine, 1961; May & Lumsdaine, 1958). Researchers suggested the research to be more focused on instructional methods than on the media that deliver the methods (Clark, 1983, 1994). Currently, some of these types of studies have become more prevalent. This brought more interest in various theories or models of communication, such as the model put forth by Shannon and Weaver (1949). The models focused on the communication process as a process involving a sender and a receiver of a message, and a channel, or medium, through which that message is sent. Authors of these models like Shannon and weaver indicated that in the planning of communication, it was necessary to consider all the elements of the communication process rather than only focusing on the medium (Lumsdaine, 1964; Meierhenry, 1980). The expression of this point of view eventually helped expand the focus of the audiovisual movement (Ely, 1963, 1970; Silber, 1981).

In 1950s, the growth of instructional TV was boosted by the availability of channels and funding (Taylor, 1967). The instructional TV had many difficulties like having good and educative programmes and even the funding became a problem when it was halted by the Ford foundations in US. Many reasons were given as to why instructional television was not adopted to a greater extent. They included teachers' resistance to the use of television in classrooms, the expenses of installing and maintaining television systems in schools, and the inability of television alone to adequately present the various conditions necessary for student learning (Gordon, 1970; Tyler, 1975). In Africa as a whole and Kenya in particular use of instruction TV in delivering educational materials or learning has not been taken with a lot of interest like in US.

Since 1950s to date, there have been new technological developments like computers, internet and mobile telephony attracting attentions of a large number of educators, and changing the previous audiovisual instructions to a modern way of educational instructions or instructional technology (Reiser, 2013). Educational gaps have been narrowed by these technological advancements and learners are able to learn even from a far distance (Bassi & Van Buren, 1999). This has really revolutionized education in the global world making the world a global village. The delivery of instructional materials through new technological formats such as CD-ROM, intranets and the Internet has increased. Enrollments in distance learning courses in higher education institutions have increased over the years across the globe with Kenya not left behind. Most universities in Kenya like the University of Nairobi (UoN) among others are offering distance learning in their various campuses. Some of the reasons why distant learning is picking up well are its affordability, access and interactivity amongst others. Currently with the new technological developments, there are more interactive features like e-mail, chat rooms, and bulletin boards among others (Reiser, 2013).

Design is like a map showing you the direction where you are going. It provides a conceptualized framework from which any communication tool is used to visualize, direct, and manage processes for future guided learning (Reigeluth, 2011). Although the roots of instructional design cannot be pinpointed, Gustafon and Branch (1997) defined instructional design as a system of procedures for developing education and training programs in a consistent

and reliable fashion. They said that selecting a proper instruction design model is as important as selecting the curriculum development model.

There are varieties of instructional design models that are used to guide the facilitation towards a diverse audience. Some instructional design models are geared towards adult learners, some towards adolescent learner, and others may be geared towards industrial training participants. The instructional design one chooses should be able to allow learners to make more decision about their instructional methods by allowing them to choose among the alternative approaches (Reiser, 2013).

In radio broadcast to schools programmes, the interactive radio lessons which are aired through KBC undergo a lot of preparations. There are subject panel members comprising of ten teachers of different subjects regionally represented, one curriculum developer and one quality assurance expert from the Ministry of Education (KICD, 2013). They sit together and develop scripts in line with the relevant curriculum and the subject. The developed raw scripts are then edited and then taken to the studio for recording. Once the programmes have been recorded they are then edited and the final finished products are taken to the archives where they are retrieved for airing and making copies for sales in the bookshops. The process is a user design process where relevant stakeholders are involved and learners are able to make decisions under the guidance of their teachers about the delivery of the content through KICD pilot testing any new programme before being aired.

Radio broadcast to schools programmes are interactive, educative and entertaining to the audiences. According to Winn (1989) it follows that the only viable way to make decisions about instructional strategies that meshes with cognitive theory is to do so during instruction using a system that is in constant dialogue with the student and is capable of continuously updating information about the student's progress, attitude, expectations, and so on.

The method of presentation varies within the models as well. A constant re-occurring theme in a majority of reputable models is the idea of the major five steps. These are; analyze, design, develop, implement and evaluate which is referred to as the ADDIE model (Heininch, Molenda, Russell & Smaldina, 1996). The model represents the core principles behind any instruction design model. This loosely resembles the ASSURE model that stands for 'analyze learners, state objectives, select media and materials, utilize materials, require learner participation and evaluation or review' (Heininch, Molenda, Russell & Smaldina, 1996).

There are different aspects in Instructional model. In the delivery of any instructional message, introduction should provide clear information by describing and giving examples of the goals, knowledge needed, and the performance expected (Winn, 1989). Learners should have opportunities to engage actively and reflectively on whatever is to be learned. There should be informative feedback with clear and thorough counsel to learners about their performance, able to help learners to proceed effectively. Above all, there should be strong intrinsic or extrinsic motivation to the users of the technology (Finn, 1972).

Radio broadcast to schools programmes are packaged with the learners' thoughts in mind. Learners get clear information on what the content is all about, they are able to interact freely and be able to give out informative feedbacks (KIE, 2005). This should be able to motivate learners and even teachers in using technology to enhance learning in class. The Interactive Radio Lessons (IRLs) produced by KICD are well researched and quality ones to supplement what the teacher is supposed to teach learners in a class. The activities should be well rewarding either by being interesting and engaging in themselves or by the activities feeding in to other achievements that concern the learners (Perkins, 1992).

Instructional model should be able to package the programmes according to the needs and ability of the user. According to Reigeluth (2011**)** instructional theories should provide guidance for customizing learning for each learner, as opposed to "one size fits all" instruction. KICD packages the programmes according to needs of the consumers. For those who have not listened

to the programmes on air or those who have listened and would like to have copies of the programmes to go and listen to them on their own can be able to put the request and their order done in the format that they want. The institute packages the radio programmes in different formats according to the requests made by the clients. The radio lessons can be package on a CD, MP3 and audio cassette formats. The packaged programmes will cater well for those learners who are slow in learning and for revision purposes. Learners should be given initiative and responsibility for their own learning while still providing support in order to make the learning process more effective, efficient, and appealing (Weir, 2010).

Feedback is the process of getting back information inquired from the receiver who are in this case the technology consumers. In radio broadcast to school, learners are allowed to send their feedback after listening to the interactive radio lessons aired. They can do this through sending SMSs and also writing to the producer of the radio programme. In a programme like 'Postbox for upper primary' the producer of the programme is able to get the feedback from learners. Instruction Theory is typically influenced by three general influences in educational thought. These are the behaviorist, the cognitive, and the constructivist schools of thoughts. According to Reigeluth (2011) feedback definitely make learning easier and more successful. Behaviorists recognized this, and called them examples, rules, and practice with feedback. While cognitivists did also recognize this, they had naturally to give them different names, such as cognitive apprenticeship and scaffolding. Constructivists also recognized this, and even radical constructivists walked the walk, even though they may not talked the talk (Reigeluth, 2011; Weir, 2010). An analysis of instruction designed by some radical constructivists revealed a plentiful use of these very instructional strategies.

In radio broadcast to schools, KICD should put proper mechanisms of receiving feedbacks from the end. This will enable KICD to be aware of some of the technological challenges that might be encountered in other parts of the country in the course of the transmission. Knowing and addressing the challenges may be able to enrich the Interactive Radio Lessons (IRLs) aired through KBC English Channel. The end users should also be able to get back responses concerning their articulated issues so as to be able to gratify their need. The feedback should be

in a loop form for proper communication to exist which is more transparent and collective. The research seeks to analyze the kind of feedback that currently exists if there is any with an aim of highlighting it for future improvement.

2.3 Conceptual Framework

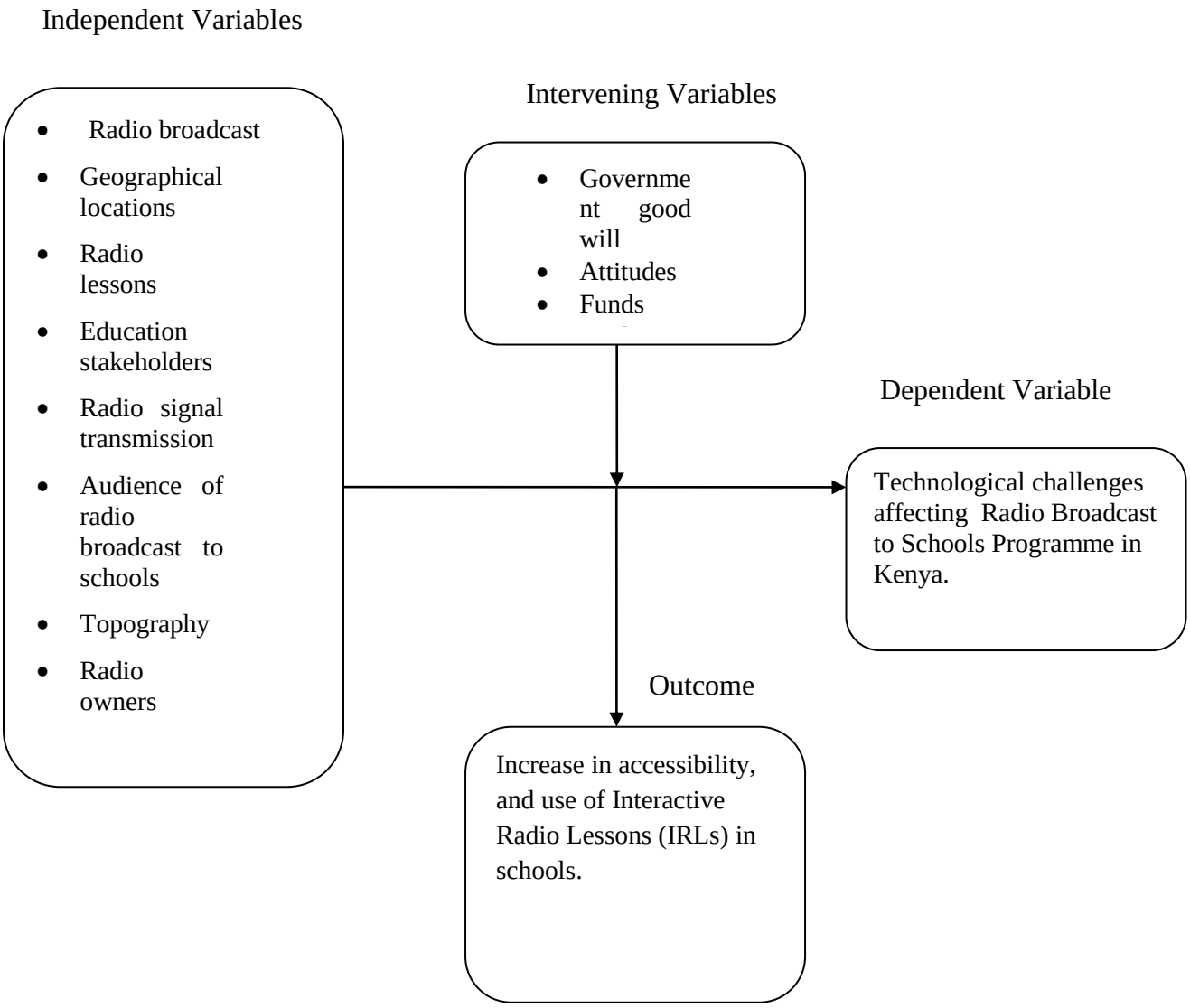
The conceptual framework normally offers the link that exists between the independent variables and the dependent variable. It shows the kind of connections between the two main variables and both the moderating and intervening variables.

Radio Broadcast to schools airs Interactive Radio Lessons (IRLs) to learners, teachers and the general public. The radio lessons are supplementary teaching programmes which aim at creative access to quality and equitable education to all learners through distance learning and for curriculum implementation process. These programmes are prepared by KICD and aired through KBC English service channel to schools and the general public. The radio programmes are also being packaged on CDs and audio tapes for schools at a reasonable fee.

The indicators of technological challenges faced by radio broadcast to schools programme are; transmission modes of the radio programmes, the development of the transmission infrastructure, the geographical location of the regions, The availability of educational hardware and software in schools and the technical know-how of the end users of radio broadcast to schools programme. These are seen as independent variables for the study.

The study seeks to establish how the indicators affect the accessibility of KICD radio broadcast to schools programmes which is the dependable variable of the study. In the relationship of the two variables, there are intervening variables which although are not main variables but they play part in influencing the link between the independent variables and the dependent variable as shown in Figure 2.3 below.

Fig. 2.3 Conceptual Frame Work



Source; Field Survey 2015

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Introduction

This chapter addressed all the methods that were used to ensure that all the research questions were answered. It comprises of research design, study population, sampling methods, data collection methods and data analysis methods.

3.1 Research Design

Research design is a logical sequence that links empirical data collection to initial research questions and the eventual conclusion. According to Yin (2003) the design deals with at least four problems. The research dealt with what questions to study, what data were relevant, what data were collected, and how was the data collected coded and the results analysed. According to Kothari (2004, Pg.31) "research design is the arrangements for the conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure". This research investigated and determined technological challenges of radio broadcast to schools programme in Kenya, faced by primary schools in Rangwe division, Homa Bay County as stated in the previous chapters and how to explore and address such challenges.

The study adopted descriptive survey design, using both qualitative and quantitative methods. The descriptive survey design is a method where by the collection of information is done through conducting interviews or administering questionnaires to the sample target (Berg, 2006). Descriptive research determines and reports the way things happen the way they are. The research describes the existing conditions and attitudes through observation and interpretation techniques (Mugenda & Mugenda, 2003).

According to Potter (2006) descriptive research design is rated as one of the best methods for conducting research in human contexts because of portraying accurate facts through data

collection for testing hypothesis or answering questions to conclude the study. This research design was appropriate for the study as it brought into focus the technological challenges faced by radio broadcast to schools programme in primary schools in Rangwe division, Homa Bay County. The research design was useful as it enabled the researcher to study variables that were happening or those variables that had happened in which the researcher has no control over (Chandran, 2004).

Surveys were used to systematically gather factual quantifiable information that were necessary for decision making. Kothari (2004) observed that a survey was an efficient method of collecting descriptive data regarding the characteristics of populations, current practices and conditions or needs. In survey, information from relatively large cases are also gathered by use of samples which makes it cheap by cutting down on costs. A survey as a method of data gathering is used to systematically gather factual quantifiable information necessary for decision making purposes.

The study employed both quantitative and qualitative methods of data collections. In the quantitative method questionnaires were used in the collection of information in the field while on the qualitative method, observations were made on the subjects according to the objectives of the study (Creswell & Clark, 2007; Johnson & Christensen, 2008; Gay et al., 2009; Creswell, 2009).

3.2 Study Population

In this research, according to the 2015 Statistical data return from AEO's Office Rangwe Division in Homa Bay County, the study population consisted of 42 primary schools of which 4 were private. The numbers of primary schools in Rangwe zone were 23 of which 3 were private, while in Randung zone there were 18 public primary schools and 1 private primary school. The enrollment population in primary schools within the division was 14824 pupils from class one to eight. It had 313 teachers and 42 headteachers. The population of learners in classes 7 and 8 were 3768.

The breakdown list of cases described the full set of cases from which the sample was taken (Chandran, 2004). These were the total population under study which had composition of an entire group of individuals, events or objects having common characteristics that conform to a given specification (Mugenda & Mugenda, 2003).

3.3 Sampling Methods

The sampling technique which was used in this study was a cluster sampling technique. The use of this sampling technique was informed by the clusters of the population where the study was conducted. Rangwe division is divided into two zones. These zones are Rangwe and Randung zones, each having different number of primary schools.

The population distributions of primary schools in Rangwe division and the sample size had been determined by the researchers which informed the use of cluster sampling technique. The cluster sampling technique was used for selecting 26 primary schools and 26 headteachers as they were grouped into the two zones.

Purposive sampling was used to select 2 Area Education Officers (AEOs) at the zonal levels; 2 KICD radio programme managers; 2 KBC technical officer; 52 teachers; and 156 pupils from classes 7 and 8 who were randomly sampled in their different classes with equal gender representations. Purposive sampling method was used as a method because of it being a non-probability sampling approach. According to Yin (2003) and also Nyagwachi (2008), non-probability sampling provides required in-depth information without making inferences and generalisations. In this sampling technique, the research data was acquired from individuals with the required characteristics relevant to the research.

In this study, the researcher only collected data from the respondents in the sampled schools and other relevant areas. Sampling is a process of selecting a number of individuals for a study in such a way that the individual selected represents the largest group from which they are selected

(Mugenda & Mugenda, 2003). Sampling is also explained as a systematic procedure for selecting individuals for a study to represent the larger group from which they are selected (Berg, 2006). Cooper further explains that sampling is a process of selecting a portion of the population for conducting a study in order to represent the population adequately since it is impossible to take the entire population because of time, financial factor and errors which may discourage the researcher and lead him/her to abandon the study (Mugenda & Mugenda, 2003).

3.3.1 Sample Size

The sample size selected in this research was based on Gay and Airasian criterion. The size of the total sample was 238 respondents which was more than 50% of the total population. The sample size included 26 primary schools in Rangwe Division; Homa Bay County randomly sampled representing 60.5% of the population category. The respondents are; 2 Zonal Education Officers, 2 KICD Program managers, 2 KBC Technical Engineer/staff, 26 public primary headteachers, 52 public primary teachers and 156 pupils in classes 7 and 8.

Gay and Airasian (2003) cited some guidelines to follow in the identification of a sufficient sample size in Leedy and Amrod (2001). According to Gay et al (2003), for a small populace of less than100 people, no need for sample size as the total population can be sampled. If the populace is around 500, 50% of the population should be sampled. If the populace is around 1 500, 20% of the population should be sampled. Beyond a certain point (approximately 5 000 and more), a sample size of 400 people is adequate.

3.4 Data Collection Methods

The study used questionnaires and observation schedules for data collection process. This is in line with mixed approach research. In the concurrent data collection, the quantitative and qualitative data were independent of each other. They were roughly collected at the same time, analyzed and presented to together (Creswell & Clark, 2007). The Questionnaires were designed to obtain details on views, problems and challenges affecting use of radio broadcast to schools by learners, teachers, headteacher, Zonal Education Officers, KICD radio programme managers and

KBC engineering staff. The researcher also made observations on the variables under study in 10 of the sampled schools. The observations made were recorded on the observation schedules which were prepared for the data collection.

3.4.1 Questionnaire

Questionnaires were used in this study to collect data from the respondents. The questionnaires were designed to obtain details on technological views, problems and challenges being faced by radio broadcasts to schools programme within Rangwe Division. The questionnaires were dropped to the respondents and picked later on the same day for analysis. According to Chandran (2004), questionnaires provide a high degree of data standardization and adoption of generalized information amongst any population. He further explained that they were useful in a descriptive survey study where there was need to quickly and easily get information from the respondents. The tool is good for getting views of respondents who are difficult to reach and also used in a large sample with dependable and reliable results (Potter, 2006).

The researcher utilized semi-structured questionnaires to collect data from the respondents. Semi-structured or open ended questions allows the respondents to contribute freely without restrictions or conditions while structured questions restricts the respondent in his or her answers by providing options from which to pick the answer from. The questionnaires were used to collect data from headteachers, teachers, learners, Area Education Officers (AEOs), KBC Technical/ Engineering personnel and KICD radio programme managers. They were asked questions touching on accessibility and awareness of radio broadcast to schools in the region, the mode of transmissions, the signal strength in relation to geographical locations, the technological infrastructural developments, the availability of hardware and software in schools, and the technological know-how in the operations of the radio sets by the end users.

3.4.2 Observation

Observations were made in the sampled schools by the researcher. This was done for the in-depth understanding and analysis according to the phenomenon under study. Observations were

used to collect qualitative data and to enrich information provided in the questionnaires. The role which was taken by the researcher during the observation periods was non-participatory. In non-participatory observation, the researcher observers and records behavior of the characters and the environment under study but does not interact or participate (Gay et al., 2009). According to Nachmias & Chava (2000) they stated the merit and explain how observation is done:

> The main advantage of observation is its directness; it enables researchers to study behaviors in real time, as it occurs. The researcher does not have to ask people about their own behavior and the actions of others; he or she can simply watch them act and speak. This enables the researcher to collect data first hand, thereby preventing "contamination" or distortion of data by factors or events standing between..... [the researcher] and the object of research (Pg.190).

The observation schedule which was used was a structured one. According to Bell, 2005 a structured observation schedule helps the researcher to decide on the focus on the research questions and some aspect of the behavior which is apparent in the study (Bell, 2005). It is also flexible as the observation can also be done by a research assistant in the absence of the researcher. In the selected schools in the region, technological challenges being faced by radio broadcast to schools programme within Rangwe division were explored and examined.

The researcher looked at modes of transmissions, topographical locations of schools and their effects on radio signal distribution strengths, the education hardware and software, and the technological know-how of the end users of the radio broadcast to schools programme. The choice of these tools of data collection was guided by the time, funds available and the objectives of the study.

3.5 Data Presentation Methods

The analyzed data after being processed and transformed was presented in different formats. The formats used were more of visual presentations which could be readily comprehended. The techniques used in the presentation of the data were graphical techniques. The graphical techniques are the most common data presenting methods. The choice of methods used in presenting data in a pictorial form must rest upon the nature of the initial data and the amount of visual information details required (Kumar, 1996).

The research used two data presentation forms which were relevant with the nature of the study. The data presentation forms to be used should be suitable for communication study data which has been adopted (Creswell, J.W., 2009). These are the tabulation and diagrammatic forms. Pictorial representations of data add less to the data that is not already there, but simply to display it more effectively for easy visualization and interpretations.

3.5.1 Tabulation Form

The analyzed data has been presented in a tabular form. Tables which are arrays of data in rows and columns have been drawn condensing a large amount of data and brings out the distinct pattern in a data in an attractive form. The tabulated data has made the comparison to be made so easily among the classes of data (Alabi, 2007). Accordingly, the tables have taken up less space than data presented in a narrative form.

In the tables there are titles of the variables being measured which is at the top as shown in Table 3.1 below. The title of the table describes the content of the table. There are captions which are the column headings, stubs which are the row headings. The footnotes provide brief explanations of the tables which are not self-evident. The units of measurement and the source of the data which may sometimes be a footnote are also provided. According to Singh & Bajpai (2009, Pg.26) they say; "In this form of presentation, data are tabulated or arranged in some properly selected classes and the arrangement is described by title and sub titles".

Table 3.1Learners views on remedial measures

Remedial measures	frequency	Percent	Cumulative Percent
Radio sets to be bought by schools	74	49.3	49.3
Schools to be sensitized	54	36	85.3
Schools to be connected with electricity power	22	14.7	100

Source; Field Survey 2015

3.5.2 Diagrammatic Form

In the research, the analyzed data were presented in bar graphs and circles or pie graphs. These diagrammatic forms of data presentation where the data is drawn take the above forms and others such as line graph, histogram and pictogram, were used so for better visual impact (Alabi, 1999).

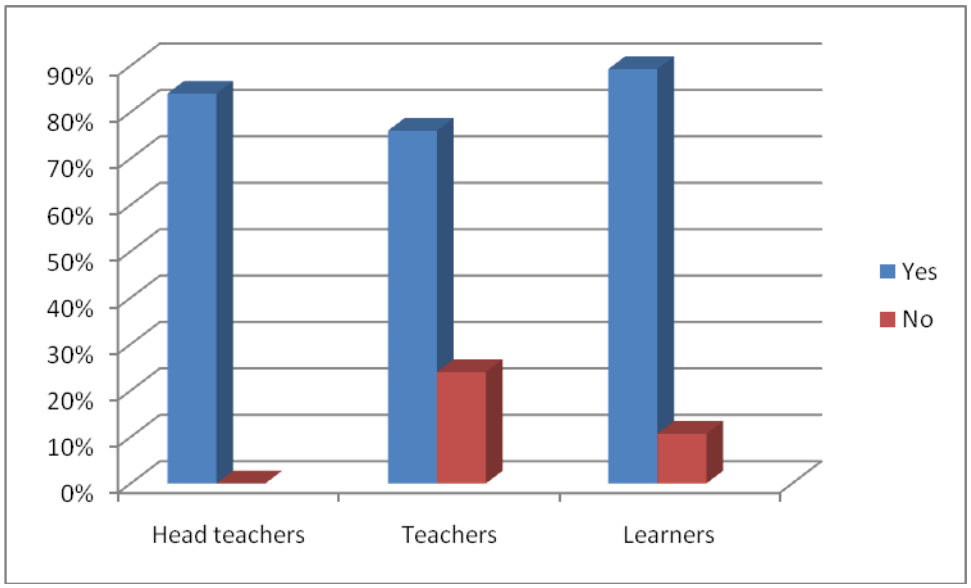
3.5.2.1 Bar Graph

Bar graph which is a pictorial representation of information by drawing of bars on the horizontal base line or X- Axis was used in the visual presentation of some analyzed data. The bar graphs are useful in dealing with data gathered from discrete variables that are measured on a nominal scale such as the data on the connectivity of electricity power in schools within Rangwe division.

The vertical lines or ordinates are marked off to scales, showing the observed magnitude or frequencies in each variables categories drawn. The bar graphs use rectangles which are bars to represent discrete data types. The lengths of the bars are propositional to the number of

frequencies within the variable categories or the magnitude of the variables. The variables' names occupy the horizontal scales and all bars should be of the same widths as shown in Figure 3.1 below (Alabi, 1999).

Fig.3.1 Example: Electricity power connections in schools



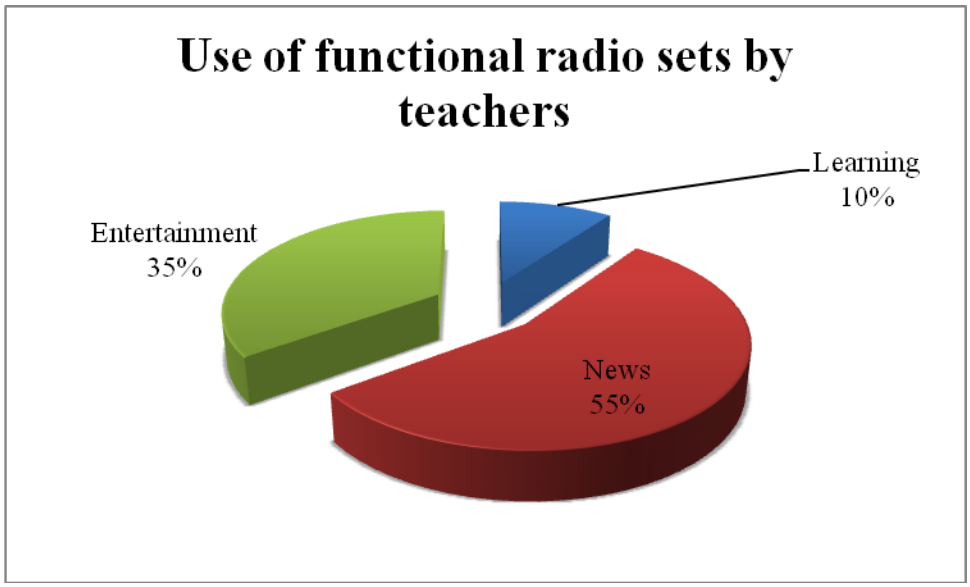
Source; Field Survey 2015

3.5.2.2 Circle or Pie Graph

The analyzed datum was presented in a circle or pie chart form as shown in Figure 3.2 below. The views of learners for what radio sets were used for were presented in the circle or pie chart form. The circle or pie chart is a pictorial representation of data assuming the form of a circle or a pie chart. It is best suited to have simple comparisons of data to do with discrete variables. It is based on proportioning a circle to equivalent percentage proportions of the frequency distribution or magnitude of the variables calculated using a circle or pie graph formula. According to Singh and Bajpai (2009) they say:

> Circles or pie graphs/diagrams provide [the researchers] as opportunity to represent statistical data through the figure or a circle and its constituents i.e. proportionate sub-divisions. These are specifically helpful in the case for which the question of the proportion is of much interest. To construct them requires a working knowledge of angle measurement and percentages (Page 34).

Fig.3.2 Example: Learners view on what radio sets are used for in schools



Source; Field Survey 2015

3.6 Data Analysis Methods

In this study, the raw data which was collected from the fields were cleaned, coded and analyzed using SPSS software. According to Mugenda and Mugenda (1999, Pg. 115) they say "…. The mass of raw data collected must be systematically organized in a manner that facilitates the analysis". Data analysis is the process by which a raw datum is cleaned, coded, and key punched into computer software like SPSS and then synthesized or compiled according to the objectives of the study to give a meaning to the study (A. T. Alabi, 2007).

The choice of statistical procedure which was used for data analysis was on the proposed objectives and the research questions of the study, the research design used and the type of

measurement scale used in the measurement of variables (Mugenda & Mugenda, 1999). In according to the research questions and objectives of the study, when the study is exploratory where the researcher is exploring an existing situation, descriptive analyses could be adequate.

On technological challenges affecting the use of radio broadcast to schools programme, the objectives of the study and its existence dictated that the descriptive analyses be utilized. Radio broadcasts to schools has been in existence for a long time since 1963. (Mugenda, & Mugenda, 1999).

3.6.1 Descriptive Analyses

The study is to use both quantitative and qualitative analytical techniques in a single research study (Johnson, & Christensen, 2008). Data analysis for the study was a mixed one due to its mixed approach. According to Creswell (2009) the mixed analysis occurs both within the quantitative (descriptive and inferential numeric analysis) and the qualitative (description and thematic text or image analysis) approaches. The analysis is to develop an iterative process where themes were created from both the quantitative and qualitative data (Wambaria, 2014).

3.6.1.1 Qualitative Data

This study used observation schedules to collect data from 10 sampled primary schools. The collected data did not need empirical analysis but a descriptive one. This is why qualitative data analysis was employed in this study. Qualitative data analysis refers to non-empirical analysis. In qualitative data analysis, a researcher may be interested in studying a phenomenon or event which may not require the collected data to be quantified but to thematically analyze the data, such as through making observations (Bruce, L. B., 2006).

For the qualitative data collected through observations made, thematic analysis was used. Jwan and Ong'ondo (2011) recommend the use of thematic data analysis in qualitative research. They

explain that thematic analysis is a method of identifying, analyzing and reporting patterns or themes within data.

Thematic data analysis follows several steps: transcribing, familiarization with the data, first and second coding and production of a report. In this study, observations were made through the observation schedules to get more in- depth information about the study. Qualitative data for the open ended questions in the questionnaires were coded and qualitatively analyzed. Those areas with closed ended questions had the data coded, quantified and subjected to quantitative analysis. Common themes were drawn from the quantitative and qualitative data guided by the research questions.

3.6.1.2 Quantitative Data

In this study, quantitative data collected mainly from the survey were analyzed using descriptive statistics. The Statistical Package for the Social Sciences (SPSS) Version 20 was used for analysis purposes. The data analysis procedure on SPSS consisted of calculating and interpreting descriptive statistics (George, D., & Mallery, P., 2003). Some of the descriptive statistics methods used were: numerical counts or frequencies, measures of central tendency (mean, mode, and median), percentages, standard deviation and measures of relationship.

Quantitative data analysis refers to numerical or empirical analysis of the raw data to create a meaning in the study. This is where the researcher is involved in the summery or description of the data using descriptive statistics. The researcher, meaningfully describe a distribution of scores or measurements using a few indices or statistics. The types of statistics or indices used depend on the type of variables and the scale of measurement used in the study which could be ratio, interval, ordinal and nominal (Mugenda and Mugenda, 1999).

In the study, numerical counts or frequencies described the number of learners, teachers, headteachers, Zonal Education Officers, KBC engineering staff and KICD radio programme

managers in relation to the objectives of the study. The median, mode, mean and percentages were used to summarize findings.

3.6.1.2.1 Ordinal Measurement

This study used ordinal measurements as its questionnaires were under the same measurements. In the study, while looking at the strengths of radio signal receptions in Rangwe division the respondents were asked to check on one of the measurements of the variables ranging from poor to very strong. The results received produced ordinal or ranked data.

Where a variable for example has measurements of poor, very poor, strong and very strong, ordinal measurement shall be used according to the questionnaires used to collect the data in the study. It indicates the rank order that something holds, but gives no indication of the distance significance in empirical form (Nachmias, 2000). Ordinal measurement can be used to draw out relative priorities that researchers assign to a range of issues. In analysis this kind of data the researcher used SPSS software analysis format (Creswell, J.W., 2009).

3.6.1.2.2 Percentages

In this study, the researcher used percentages to analyze the collected data. For example the researcher asked the respondents a question on the availability of functional radio sets in schools. He enquired whether the schools within Rangwe division had functional radio sets. The analysis of the data collected was done in percentages as the main interest of the researcher was to know the percentages of schools which had functional radio sets, which is one of the educational hardware for use in the radio broadcast to schools programmes.

Percentages are proportional or rate measurements of particular values in relation to 100 units. It is used to convert values of variables to a uniform standard for ease of comparison. Percentages are very useful in scoring and measuring learners' performance in schools. It is also useful in

getting the proportion of different characteristics of variables (Chava, Frankfort-Nachmias., & David, Nachmias, 2000).

Each component is expressed as a proportion of the total and then multiplied by 100 to get a percentage. For example Total number of learners responded is X and the total number of learners agreeing with using radio broadcast programmes in classes for learning are Y. Therefore, the percentage of the learners who agree will be calculated as;

(Y/X) * 100 = Z% (Gay, L.R.., Mills, G.E., & Airasan, P., 2009).

3.6.1.2.3 Median

This study used median measurements as its questionnaires were under the same measurements. For example the researcher asked the respondents a question on the frequencies of the learners listening to radio broadcast to schools programme in classes. He posed a question to know of how many times in a week did learners listen to the radio lessons in classes. The analysis of the data collected was done in the median measurements.

The median is a proportional measure which divides a systematic distribution pattern in to two equal parts. It is an observation that is located half way between the smallest unit to the largest unit of observations in the distribution pattern or list arranged in order. It used mostly with variables that are measured at or above the ordinal levels (Nchmias, 2000).

The researcher observed the median of ungrouped data by identifying the media observable number or unit. To determine the median in frequency distribution data, the category containing the cumulative percentage of 50% must be located. For example in Table 3.2 below, the cumulative frequency is " twice a week" which is has a cumulative percentage of 51.1%. The researcher can still use this to calculate the median of any frequency distribution pattern in the analysis of the questionnaires.

Table 3.2 Example: frequency of learners listening to radio lessons in class

Remarks (Tick appropriately)

NO.	Listening frequency	Frequency (f) N=450	Percentage P=100	Cumulative percentage CP=100
1	None at all	20	4.5	4.5
2	Once a week	110	24.4	28.9
3	Twice a week	100	22.2	51.1
4	Thrice a week	90	20.0	71.1
5	Four times a week	80	17.8	88.9
6	Five times a week	50	11.1	100

Source; Field Survey 2015

3.6.1.2.4 Mean

This study used mean measurements according to the same measurements of its questionnaires. For example on the question of the frequencies of the learners listening to radio broadcast to schools programme in classes, the researcher could be able to find the mean of the number of learners listening to radio lessons in their different classes per week. The analysis of the data collected was done in the mean measurements.

Mean is the average unit within the frequency distribution list. Arithmetically, the mean is the sum total of all observations made divided by their number, shown as;

$Z = X/N$

Where Z = the arithmetic mean

X = the sum of the total observations

N = the number of observations

It is the most frequently used measure of central tendency (Nachmias, 2000). It is what most people consider to be average. In computing mean in a frequency distribution list, it is not necessary to add up all the individual observable units, but give each category its proper weight by multiplying it by its frequency as shown in the equation below;

$Z = fX/N$

Where fX = the sum total of all categories multiplied by their respective frequencies.

N = the number of observations

It is important for the researcher to take note of a misleading measurement from mean especially whenever there are some observable units with extremely high or low values (Nachmias, 2000).

CHAPTER 4
DATA PRESENTATION AND ANALYSIS OF FINDINGS

4.0 Introduction
This chapter deals with data presentations and analysis of the findings of the study. The analysis of the study has been done in line with the research questions and objectives of the study.

4.1 Profile of the Respondents
In the study, 26 primary schools within Rangwe division under Homa Bay District Education Office (DEO) were sampled. The original sample represented 60.5% of the total population of the primary schools in the division. In the actual sample, only 25 primary schools responded representing 59.5% of the total population. The study was conducted in the two zones within the division. The zones were Rangwe and Randung zones. In Rangwe zone, the numbers of primary schools sampled were 14 inclusive of 2 primary schools which were private, against the total number of 23 primary schools. In Randung zone, 11 primary schools were also sampled, which included 1 private primary school out of the total number of 19 primary schools in the zone.

The total number of respondents was 229.The number of headteachers who participated in the interview were 25, representing the 25 primary schools of which 3 were private while the remaining 22 were public. The number of teachers who were interviewed were 50; 2 per the 25 primary schools in the division. In each school, six learners of each gender in classes seven and eight were interviewed, adding up to a total of 150 learners who responded. In the District Education Office (DEO), the two zonal Area Education Officers (AEOs) or TAC Tutors were also interviewed as well as 2 engineers at KBC. Lastly, 2 radio programme coordinators at KICD were also interviewed.

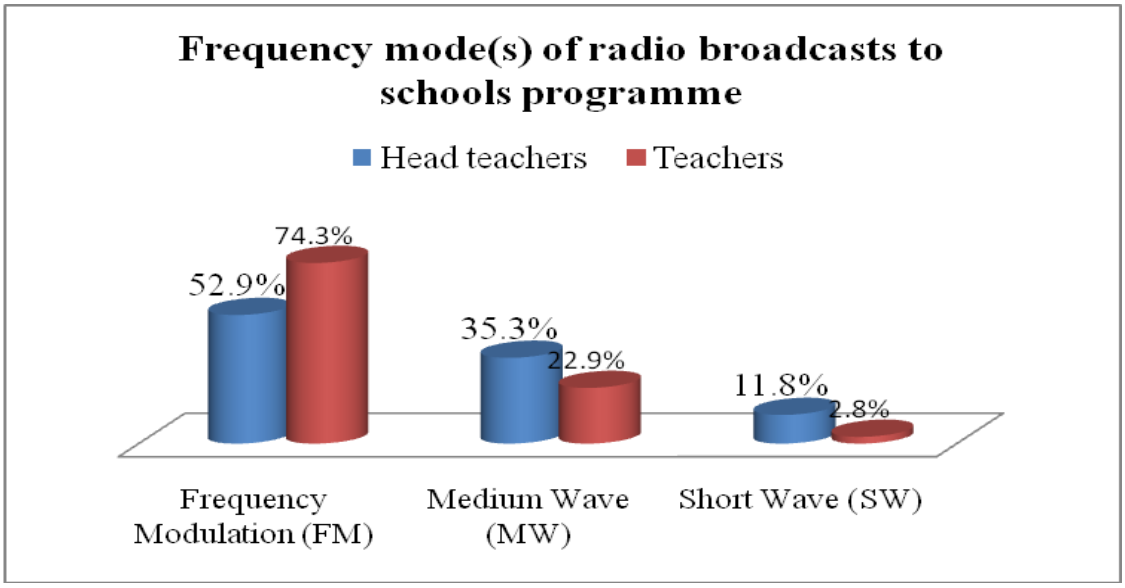
4.2 Response Rate
The total targeted respondents were 238 but only 229 actually responded to the questionnaires administered, representing 96.2% of the response rate in the study. Questionnaires from one school; Disii Kochia primary school in Randung division were not collected due to the

unwillingness of the headteachers to submit them to the researcher. The questionnaires were being dropped and picked later by the researcher.

4.3 Mode(s) of Transmissions

To establish the mode(s) of transmission of KBC radio broadcasts to schools programme, respondents were asked which frequency mode(s) were they able to receive the broadcasts signals of radio lessons transmitted through KBC English service channel. Headteachers and teachers responded to the question differently. The results were as shown in the Figure 4.1 below.

Fig. 4.1 Frequency Mode(s) of KBC Radio Broadcast to Schools



Source; Field Survey 2015

More than half (52.9%) of the headteachers who responded to the questionnaires said they were able to receive radio broadcasts to schools programmes through Frequency Modulation (FM) mode because of its signal clarity, whereas 35.3% and 11.8% said they were receiving the radio programmes through Medium Wave (MW) and Short Wave (SW) modes respectively.

Majority of the teachers (74.3%) said they receive radio programmes through tuning the radio sets to Frequency Modulation (FM) mode, 22.9% to Medium Wave (MW) mode and the remaining 2.8% to Short Wave mode.

From the analysis, majority of headteachers and teachers were tuning to FM mode more than any other modes. This was occasioned by clear reception patterns in the region, making the FM mode easily accessible in most parts of the geographical location of the region. The FM boosting stations are also well upgraded by KBC engineers in all the 47 counties in Kenya.

According to the responses from the two KBC engineers interviewed, schools were able to receive radio broadcasts to schools programmes through Frequency Modulation (FM), Medium Wave (MW), digital platform, and even through the internet. The modes are active and operational to accommodate any KBC radio audience. Though the digital platform is still new in Kenya, it is picking up well. With the use of set top- boxes, listeners and viewers are able to listen to radio channels of their choice as well as choose to view other TV channels including KBC Channel One. Through internet connections one can be able to watch and listen to any channel, but the limit is in its connectivity and availability both at homes and schools. It is still out of reach for many schools in Kenya due to low connectivity, cost and technical know-how.

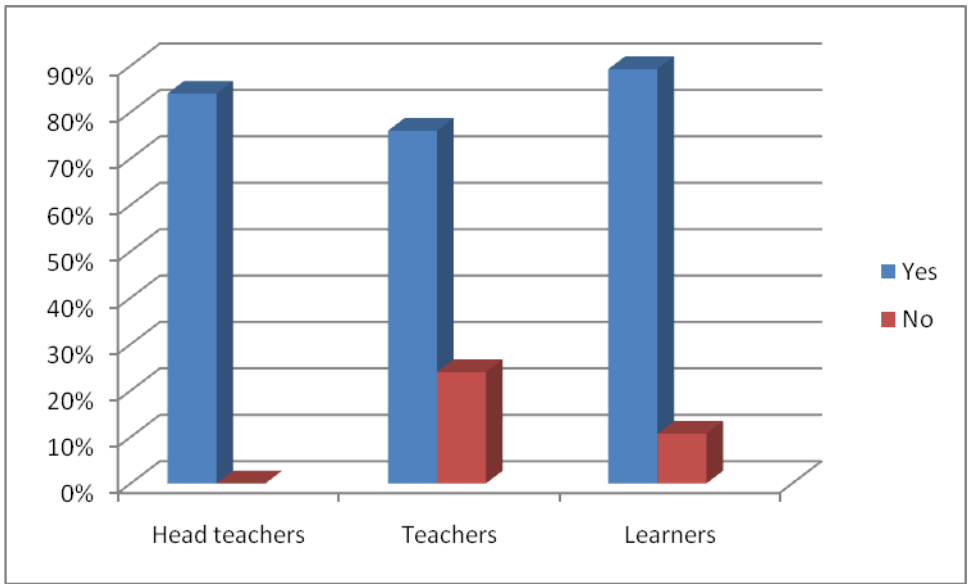
The information given by KBC engineers were supported by those from the side of KICD through their two programme coordinators. According to KICD the information concerning the transmission modes is well elaborated in the radio broadcast time tables that the Institute produces annually. The radio broadcasts reception frequencies and coverage areas are on the schools broadcasts time tables which are disseminated annually to all schools throughout the country. In the printed time table, (see Appendix M) only two frequency modes are there; Medium Wave (MW) and Frequency Modulation (FM) modes. According to the two radio programme coordinators at KICD, this acts as a guide for the end users when tuning to the KBC English service channel.

4.4 Infrastructural Developments of Technology

Infrastructural development of technology in this context referred to the connectivity of electricity power in the region and the development of clear radio signals by KBC through building of sub stations for boosting the radio signals.

In identifying the infrastructural development within Rangwe division in relation to radio broadcasts to schools, the respondents were asked whether there were electricity power connections in the sampled schools. Headteachers, teachers and learners interviewed gave their responses. The responses were as shown in the Figure 4.2 below.

Fig.4.2 Electricity power connections in schools



Source; Field Survey 2015

About the connectivity of electricity power in schools within Rangwe division, the schools in Rangwe zone were 83% connected with electricity power according to the Rangwe zonal Education Officer (EO). Most schools were only waiting for commissioning phase by the government. In Randung zone the connectivity of electricity power in schools was 78%. According to the two zonal Area Education Officers (AEOs) or TAC Tutors, wiring had been done in most schools, but commissioning of the programme by the government had not yet been done.

When headteachers were asked whether their schools were connected with electricity power, 84% said yes whereas 16% said no. Most of the schools which were not connected to the electricity power had the wiring done just waiting to be commissioned by the government so that they could start using their power.

Majority of the teachers interviewed (76%) agreed that their schools were connected with electricity power even though most of the connections had not been commissioned by the government, whereas 24% said their schools were not connected with electricity power.

Majority of the learners, 89.3% said their schools were connected with electricity power whereas only 10.7% said their schools were not connected with electricity power.

The high rate of power grid connectivity in schools was being necessitated by the roll out of laptop project, currently referred to as Digital Literacy Programme (DLP) by the Jubilee administration to all primary schools in Kenya. This has been in preparation to the government providing laptops to schools which will eventually require electric power for their operations.

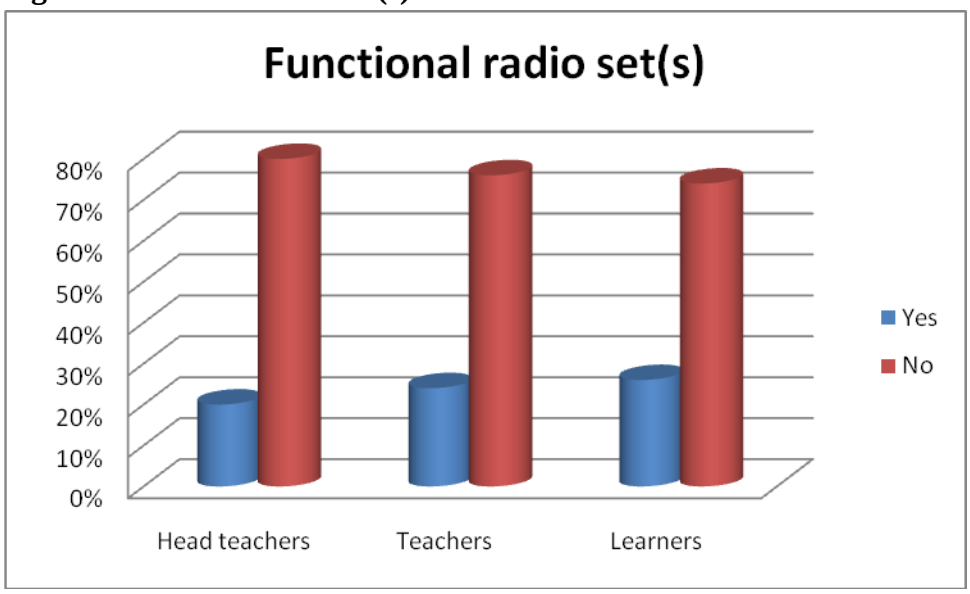
On the development of transmitting sub stations, KBC engineers interviewed said the station was continuously trying to boost its radio signal strength by building small sub-stations within the 47 counties in Kenya especially, in areas where the radio and TV signals were deemed weak. The process is normally to enhance more listenership or viewership of the audiences. They said that the process is an ongoing one always responding to the feedback information received from KBC audiences.

4.5 Educational Hardware and software in Schools

Educational hardware in this context referred to electronic media equipment like functional radio sets, CD/DVD or tape recorders or players in schools. Software is the lessons recorded on tapes or CDs/DVDs, broadcast time tables and teachers' guides.

To identify the educational hardware in primary schools within Rangwe division, respondents were asked whether there were functional radio sets, and prompt distributions and availability of broadcast time tables in the schools. Those who responded to the question asked were the headteachers, teachers and learners. The responses received from the respondents were as shown in Figure 4.3 below.

Fig.4.3 Functional radio set(s) in the school



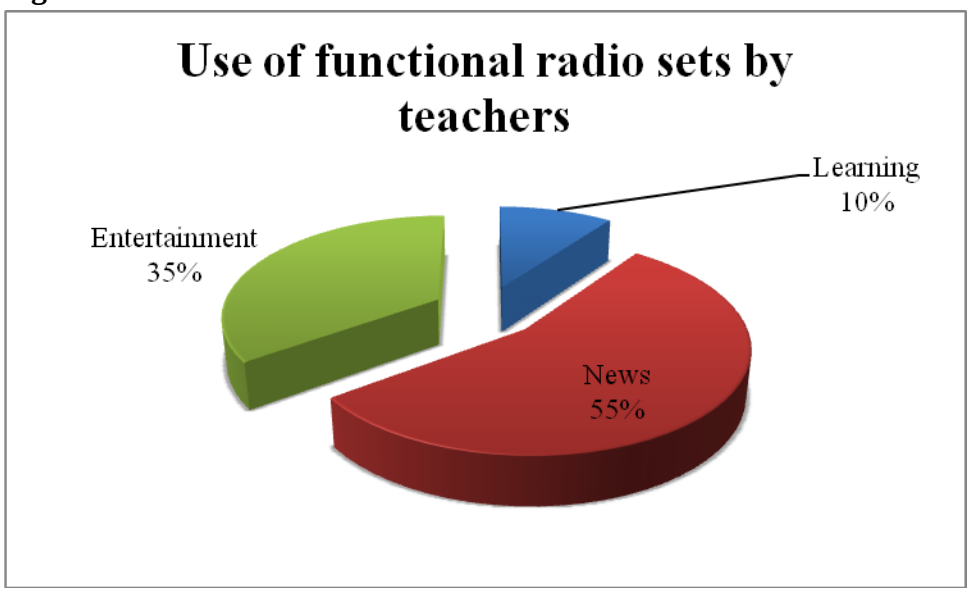
Source; Field Survey 2015

80% of the headteachers who were asked whether they had functional radio sets in their schools said they did not have functional radio sets whereas 20% said they did have functional radio sets. Majority of the headteachers who had functional radio sets in their schools had the old ones like the World Space receivers which were either worn out or non-functional, while those without the radio sets were still waiting for KICD to buy them the radio sets to be used in schools.

76 % of the teachers who were interviewed said their schools did not have functional radio sets whereas the remaining 24% said they had functional radio sets in their schools. Those who had functional radio sets were mostly using them for listening to news and entertainments, while those teachers who had no radio sets attributed this to constrain on the budgetary allocations by the government to schools, making them not to be able to buy radio sets.

When learners were asked what teachers were using the radio sets for in schools. They gave different views on what teachers were using functional radios for as shown in Figure 4.4 below.

Fig: 4.4 Learners view on what radio sets are used for in schools



Source; Field Survey 2015

The 26% of the learners who said that they had functional radio sets in their schools, 90% of them agreed that those radio sets were not being used in classes for teaching purposes but for listening to news and entertainments by their teachers. Whereas only 10% of the learners agreed that teachers were using the functional radio sets to teach in classes.

According to the response received from KICD, radio broadcast to schools is facing some challenge in schools and one of those challenges are lack of functional radio sets in schools which concurred with the responses received from teachers, headteachers and learners. Most schools are not having functional radio sets. The sets you could be able to get were those ones which were being used during World Space broadcasts to schools programme. Some schools still wait for KICD to buy them radio sets which is not the mandate of the Institute. This demonstrated lack of awareness on the side of headteachers, teachers and learners. According to KICD radio programme coordinators, these kinds of challenges were continuously being addressed through the Institute organizing continuous teacher orientation programmes and through the annual headteachers' conferences.

On the availability of broadcast time tables in schools, the respondents were asked whether they were receiving broadcast time tables promptly and annually. Absolute majority of the headteachers said that they were not receiving the broadcast time tables as required. This was even evident in their offices where you could not be able to see any current broadcast time tables on the walls. Lack of broadcasts time tables was hampering the use of radio broadcast to schools programme as the lessons could not be harmonized with the ones being transmitted, for the smooth flow of learning.

When the zonal Area Education Officers (AEOs) or TAC Tutors were asked whether the distributions of radio broadcast to schools time tables were prompt and annually to schools. They all agreed that they were never informed of the availability and distribution mechanisms of those time table.

The two radio programme coordinators at KICD said that they normally distribute broadcast time tables to all District Education Officers (DEOs) in the country for the officers to distribute them to all schools within their districts. They also make available broadcast time tables by uploading radio broadcast time tables annually on the KICD website for any download by teachers in their schools and the general public.

4.6 The Geographical Locations of Schools

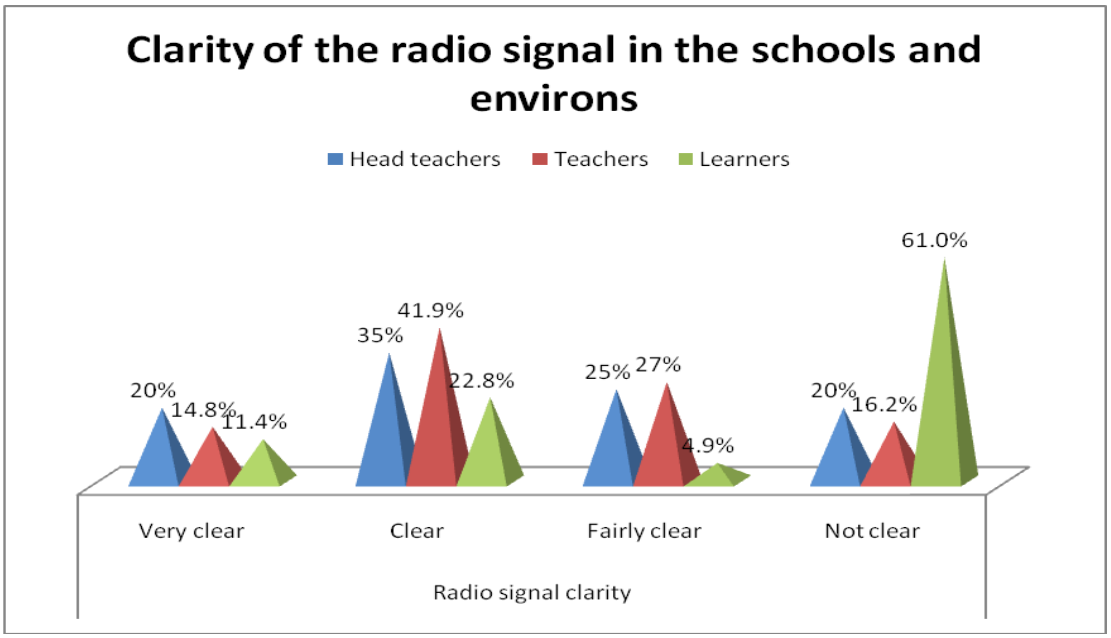
Geographical locations in this context referred to the topographical areas comprising of hills and valleys where the schools are situated acting as barriers to clear radio signals receivership strengths.

In establishing the geographical location of Rangwe division in relation to the strengths of radio signals distributions, the respondents were asked whether they were able to receive clear KBC English service radio signals in their schools and their environs. The results were as shown in Figure 4.5 below.

According to the two zonal Area Education Officers (AEOs) or TAC Tutors interviewed, in Randung zone most schools have poor signal receptions due to the topography of the area. The area lies on the leeward side within the hills. In Rangwe zone, the radio signal receptions in most schools were better and schools were able to receive clear radio signals. This confirmed the

report from KBC engineers who said that some parts of the division is well covered in terms of signal receptions, while other areas are signal shadows (terrestrials). The way to improve on their poor signal strengths was through satellite transmissions.

Fig. 4.5 Clarity of the radio signal in schools



Source; Field Survey 2015

More than half of the headteachers who responded, (55%) agreed that they could be able to receive good radio signals in their schools and the environs through tuning to FM mode. 20% of the respondents said the radio signal receptions in their schools and the environs were poor whereas 25% said the signal receptions were fair. Those with weak radio signals in their schools and the environs attributed this to lack of or being far away from sub stations or signal boosters in their areas. They as well agreed that their areas were lying on the leeward side, as most of those areas are hilly.

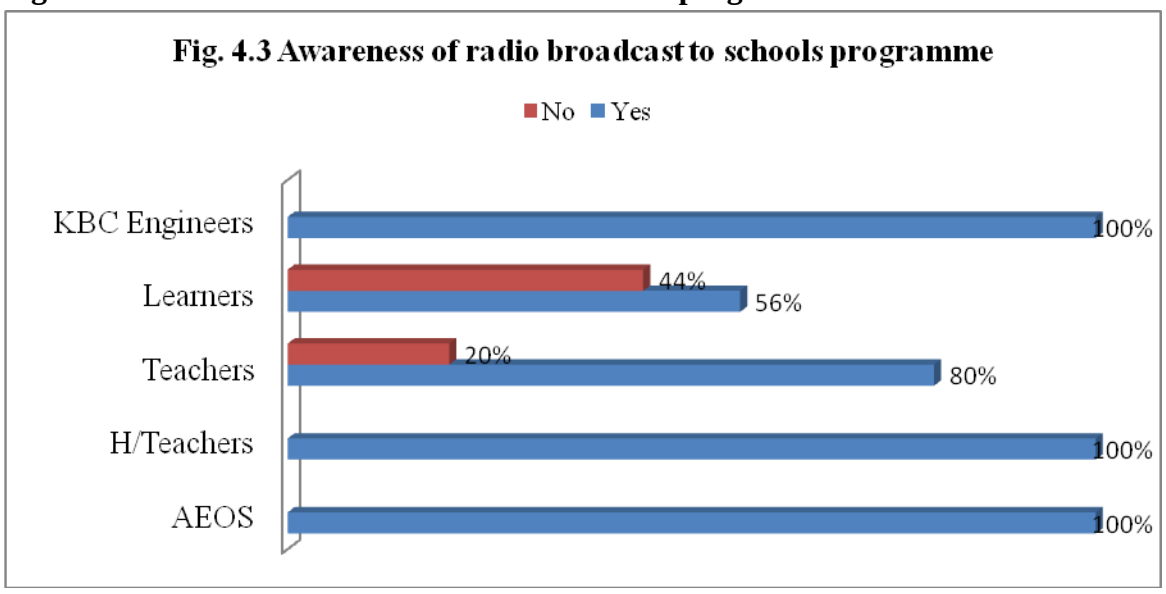
Headteachers and teachers who were tuning to FM channel mode were doing so because the mode has got clear radio signal receptions, accounting for 56.8% of good radio signal strengths in those areas whereas 43.2% said that the signal strengths were poor. Majority of those who said that their areas had poor radio signal receptions were from Randung zone. They attributed the

poor radio signal strengths to lack of sub stations closer to boost the signal strengths as the areas lie in the leeward sides of the hills.

61% of the learners interviewed said that in their schools, KBC English service radio signals were not clear whereas 4.9% said that the signals were fairly clear. 11.4% of other learners said that the signals were very clear whereas 22.8% said the signals were clear. Learners who said that they had weak radio signals in their schools wanted the radio signals to be boosted in their schools for them to be able to enjoy the radio programmes, just like other learners listening to the programmes.

When the respondents were asked whether they were aware of the transmissions of radio broadcasts to schools programmes being transmitted through KBC English service channel, headteachers, teachers and learners responded as shown in Figure 4.6 below.

Fig. 4.6 Awareness of radio broadcasts to schools programme



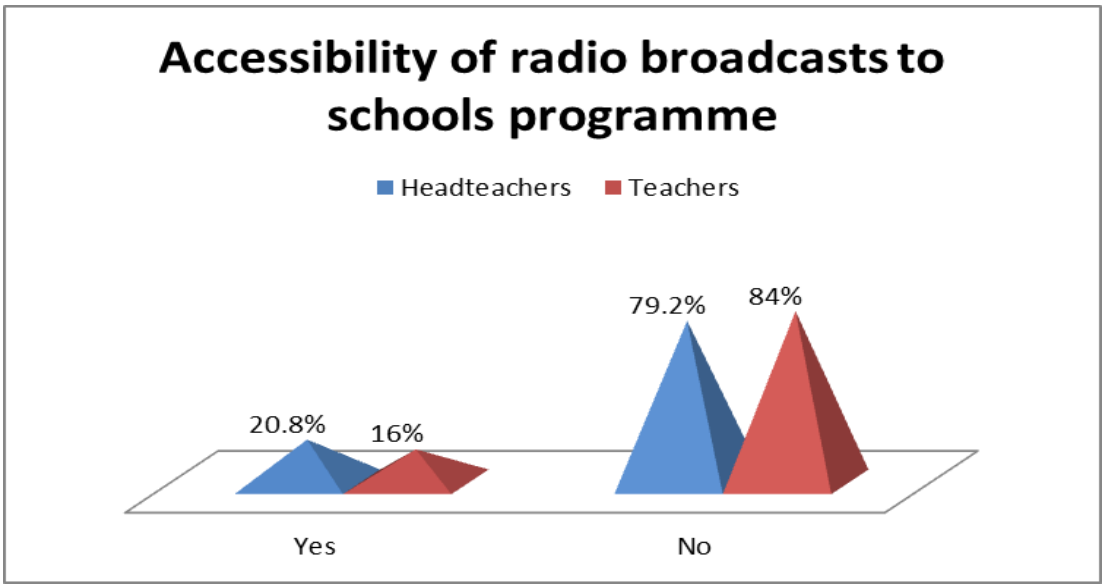
Source; Field Survey 2015

Absolute majority (100%) of Area Education Officers (AEOs), headteachers and KBC engineers/ technicians are aware of radio broadcast to schools programme, unlike in the cases of teachers and learners. 80% of the teachers were aware of the radio programme whereas 20% were not aware. Similarly, 56% of the learners were aware of the radio programmes whereas 44% were not aware. Teachers and learners who are the major consumers of the programme were not

absolutely aware making the accessibility and use of radio broadcast to schools programme to be low. Increasing the awareness of teachers in the use of radio programmes will definitely increase the awareness of learners too. This is because teachers will be able to use instructional radio lessons in classes thereby making the learners acquainted with the radio programmes.

On the accessibility of radio broadcasts to schools programme, headteachers and teachers were asked whether they were able to access radio broadcasts to schools programme. The responses received the two groups were as shown in Figure 4.6 below.

Fig. 4.7 Accessibility of radio broadcasts to schools programme



Source; Field Survey 2015

When the headteachers were asked whether they were able to access radio broadcast to schools programme being transmitted through KBC English service channel, 79.2% said no whereas 20.8% said yes they were having access to the transmitted radio programmes. This meant that the accessibility of radio broadcast to schools programme is still low. More work need to be done to increase its accessibility.

84% of the teachers who were interviewed had no access to radio broadcasts to schools programme being transmitted through KBC English service channel whereas 16% had access to the radio programmes either through their personal home radio sets or cell phones.

The awareness in general was higher than the way headteachers and teachers were able to access the radio broadcasts to schools programme. This was evident because there is lack of coordination on the part of KICD and the Ministry of Education concerning the use of radio broadcasts to schools programmes to supplement teaching and learning in schools.

When headteachers and teachers where asked the challenges they were facing in schools in the accessibility of radio broadcasts to schools programme, their responses were as indicated in the Table 4.1 below. Reference points were taken from respective entries from the headteachers column, yielding positive and negative disparities as shown in the table.

Table: 4.1 Challenges faced by schools in the accessibility of radio broadcast

No.	Challenges	Headteachers Frequency	Teachers Frequency	Headteachers %	Teachers %	Mean	Mean %	Disparity %
1	Lack of radio sets	22	43	88	86	0.8	87%	2
2	Lack of electricity power	13	40	52	80	0.6	66%	-28
3	Lack of sensitization	23	47	92	94	0.9	93%	-2
4	Poor signal reception	19	35	76	70	0.4	73%	6
5	Lack of broadcast time tables	20	39	80	78	0.7	79%	2
6	Lack of teachers guides	18	21	72	42	0.6	57%	30
7	Lack of teachers	12	15	48	30	0.5	39%	18

8	Lack of technical know-how	17	16	68	32	0.3	50%	36
9	Lack of government support	11	19	44	38	0.4	41%	6

Source; Field Survey 2015

The majority of headteachers and teachers overall on challenges being faced by schools in accessing radio broadcast to schools programme, 96% said sensitization is a key challenge followed by lack of radio sets and broadcast time tables at 87% and 79% respectively. These were followed closely by poor radio signal reception strengths at 73%, lack of electricity power at 66%, lack of teachers' guides at 57% and lack of technical know-how at 50%. Others were lack of government support at 41% and lack of teachers at 39%.

Although both teachers mentioned lack of technical know-how, teachers guides, electricity power and teachers as some of the challenges which were being faced by radio broadcast to schools programme, their wide disparity were evidently being seen as in Table: 4.1 above. Lack of technical support had the highest disparity standing at 36%, with 68% of headteachers agreeing with it whereas 32% of teachers were also agreeing with it. Another challenge which had a wide disparity gap was lack of teachers' guides which was 30%. Percentage of the headteachers agreeing with lack of teachers' guides were at 72% as compared to that of teachers which was at 42%. Lack of electricity power connections in schools also had a wide disparity of -28% with headteachers at 52% and teachers at 80%.

Other challenges like shortages of teachers, delayed government support and poor radio signal receptions, their disparity were at 18%, 6% and 6% respectively. Lack of radio sets, sensitization and lack of radio broadcast time tables had very marginal disparities of 2%, -2% and 2% respectively.

The views of learners interviewed on the remedial measures to be put in place in order for the use of radio broadcast to schools programme in their schools were as indicated in Table 4.2 below.

Table: 4.2 Learners views on remedial measures

Remedial measures	Frequency	Percent	Cumulative Percent
Radio sets to be bought by schools	74	49.3	49.3
Schools to be sensitized	54	36	85.3
Schools to be connected with electricity power	22	14.7	100

Source; Field Survey 2015

All the learners interviewed decried the lack of using radio broadcast to schools in their classes which was making them to lose a lot in education, unlike other schools where learners were able to be taught in their classes by listening to live radio lessons transmitted through KBC English service. They agreed absolutely that the programmes are good and very motivating to them, if only they could be integrated in their lesson processes. The radio programmes could also go a long way in helping them improve their pronunciations, listening abilities and to be mastery of languages such as English and Kiswahili. 49.3% of the learners called for schools to be able to buy radio sets, 14.7% would like schools to be connected to electricity power and use the power, and the remaining 36% would like government to sensitize their teachers on the use and benefits of radio broadcast to schools programmes which is there to supplement learning in schools.

The two KBC engineers interviewed said KBC English service radio frequency signal distribution strengths in Rangwe division, Homa Bay County was good, though there were some areas or points where the signals are weak due to the topography of those place. These places have hills, valleys and tall trees blocking transmitted signals from being received by radio receivers. In those areas they are able always to be alerted by KICD, viewers and listeners of the channels for the poor signal strengths. Once they are alerted, they normally carry out corrective maintenance and installations of appropriate equipment in order to help various transmission sites relay the signals which in most cases are FM signals. According to the KBC engineers, the station has FM radio coverage expansion plan countrywide to help various transmission sites relay Frequency Modulation (FM) signals. This in view is to enhancing more listenership and viewership of KBC audiences.

According to the response received from KICD radio programme coordinators, the KBC English service signal strength in Rangwe division is good. The Institute coordinates with KBC the service provider through holding frequent consultative meetings, stationing KICD continuity announcer at the KBC station and making sure that producers and managers at the Institute have radio sets to monitor the broadcast. This enables them to know the signal distribution strengths during the broadcast to schools programme.

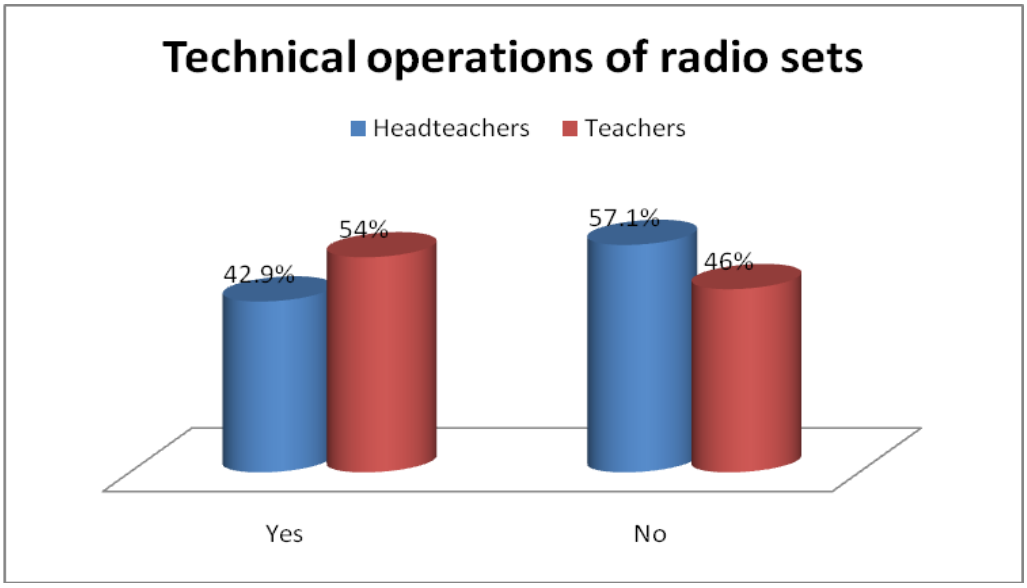
The KBC Engineers said that the topographical barriers such as; non-plain landscape, conductive soil, hills and valleys, and tall buildings mostly in urban settlement areas interferes with signal transmissions by blocking FM signal transmissions to penetrate through. Digital platform is devoid of these challenges as ones the signal strength is full it is full and if it is not there it is not there. In digital platform, the signal is either full or not. The best solution for all these challenges in poor signals transmissions according to KBC engineers is for the country to embrace digital technology by enhancing its adoptability process. Others ways to overcome the challenges may be to ensure highest points or sites are used for FM signals, use of gap fillers to take care of signal shadow areas and use of satellite and terrestrial transmissions to cover difficult areas.

Where there were challenges, the technical support both from KICD and KBC work together in order to address such technical challenges. KICD normally carries out monitoring of the radio programme to evaluate accessibility of the radio broadcast to schools programme countrywide in sampled schools in the counties even though in Homa Bay County, none of this has been conducted of late.

4.7 Technological Know-How in Operating the Radio Sets by the End Users

In understanding how the technological know-how on operating the radio sets by the end users affects the use of radio broadcast to schools programme in the region, the respondents were asked whether they had technical know-how in operating the radio sets in classes. The results of their views were as shown in Figure 4.6 below.

Fig.4.8 Technical know-how on the operations of the radio sets



Source; Field Survey 2015

On whether the headteachers had the technical know-how in handling of the radio sets, 42.9% agreed that they were able to operate the radio sets without any problem as they were simple devices, whereas 57.1% said they had problem in operating the radio sets. When those who were not able to operate radio sets were asked why they had problems in operating the sets, 40.9% said that sometimes the sets were too complicated for them to understand like the World Space

radio receivers, 34.8% said there was lack of enough time within the lessons making their work a bit tedious whereas the remaining 24.3% said that the schools lacked radio sets so they could not be able to measure their technical prowess.

54% of the teachers interviewed said that they had technical know-how in terms of operating any radio sets as they were not complicated to operate, whereas 46% said they did not have any technical know-how to operate the radio sets as most radio sets came without their operating manuals. Teachers said they lacked confidence to operate the radio sets as there was lack of training on any new radio sets bought.

According to KICD, most schools were not accommodating radio broadcast to schools programme due to lack of technological know-how on the side of teachers in operating radio sets. There is a psycho- social challenge dissuading most of the teachers from the use of the radio broadcast programme in classes. According to radio programme coordinators at KICD, adoption of technology was a big challenge in schools. Teachers lacked adequate training on how to operate and integrate technology in teaching and learning in schools. Therefore for any meaningful use and success of any technological mode of teaching, there should be proper training of teachers and other end users on how to be able to embrace the technology put in place for learning purposes like the schools radio broadcasts.

4.8 Observation

The observations which were made in 10 primary schools including 2 private ones, found out that absolute majority of the primary schools observed were not using radio broadcast to schools programme. Headteachers and teachers were not using the radio lessons to supplement learning in schools.

Most schools (90%) visited did not have functional radio sets and the school administrations were less concerned with the radio broadcast to schools programme. There were no CD, DVD

and even tape players in schools which they could use to listen to already recorded lessons in classes.

Those few schools (10%), which had functional radio sets and were not using in listening to radio broadcast to schools programme were receiving their radio signals through Frequency Modulation (FM) mode and Medium Wave (MW) modes.

Absolute majority of primary schools were receiving the broadcast radio programmes through Frequency Modulation (FM) mode and the Medium Waves (MW). The two transmission modes were the only modes which could be received within the division and according to the broadcast time tables produced by KICD annually, the modes are the ones indicated for the signal receivership of schools broadcasts transmissions. The FM mode was clearer as it was widely used within the division, unlike the Medium Waves (MW) mode.

Few primary schools (20%) were not connected to the grid, but most of them (80%) were connected with the electricity power. This was a break from before where most primary schools were never connected at all to the electricity power. The turn-around has been due to the free laptop project drive for primary school learners initiated by the Jubilee government as part of their agenda for implementation. It has changed the infrastructural development in schools and by large to the whole country. Most schools in the division are connected to the power with few waiting for the commissioning of the project in their respective schools for them to start using electricity power in those schools.

It was clear that when KICD moved their transmissions from World Space to KBC, the changeover was never made known to schools. Some schools still believe that the transmission is through World Space there by clinging on to World Space Radio Receivers of which most of them were not functioning. Most school heads (80.5%) were still waiting for information from KICD on what to do about those World Space radio receivers. Whereas 19.5% were aware of the changeover, they were not utilizing the radio programmes being aired due to one reason or another.

In terms of radio signal receptions within the division, most schools were receiving clear radio signals. The KBC English service was being received well apart from most schools (70%) within Randung zone which were having poor signal receptions especially the English service channel.

In those areas other channels like the Kiswahili channel were well received clearly apart from the English Service channel.

In the schools visited, few of their teachers (25%) including their heads lacked technical know-how on how to operate the radio sets. Not being able to operate the radio sets normally reduces their self-confidence and self-esteem, impacting negatively on the use of radio sets by teachers in class as they feel embarrassed when faced with this kind of challenges. A school in Rangwe zone known as Koyo Primary school amongst others could not use the radio sets in class due to such kind of challenges which sometimes is made worse by poor signal reception in those areas.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMENDATIONS

5.0 Introduction

This chapter contains summery of the key findings, contributions of the study, conclusions, recommendations, and suggestions for further research.

5.1 Summary of the Key Findings

In this thesis, summary of the key findings is presented based on the laid down five objectives, outlined in Chapter One of the study.

5.1.1 Mode(s) of Transmissions

This study sought to establish the mode(s) of transmission of KBC radio broadcast to schools programme. From the findings, majority of the respondents confirmed that they were able to receive radio broadcast to schools programme transmitted by KBC English channel through Frequency Modulation (FM) mode. This was because the FM mode was very clear and KBC has also developed its infrastructure well to boost its radio signal reception patterns. The other mode which was also confirmed by KICD and KBC was Medium Wave (MW) mode. These are the only two modes which the audience can tune to when listening to radio broadcasts to schools programme.

It was clear that when KICD moved their transmissions from World Space to KBC, the changeover was never made known to schools. Some schools still believe that the transmission is through World Space, there by hanging on World Space Radio Receivers of which most of them were not functional. Most school heads were still waiting for information from KICD on what to do about those World Space radio receivers in the division.

5.1.2 Infrastructural Developments of Technology

This study sought to identify the infrastructural development within Rangwe Division in relation to radio broadcast to schools. It was clear from the findings that majority of the respondents confirmed the connectivity of electricity power in schools within Rangwe division. Most schools had been connected to the electricity power grid. But due to the bureaucracy of the government,

it is taking too long to commission the electricity power connections in schools making the schools to still not enjoy the use of electricity power. Electricity power grid connection is a government initiative following the role out of laptop project by the Jubilee administration to all primary schools in Kenya.

On the development of transmitting sub stations, the KBC engineers agreed the station has tried to boost its radio signal strength by building small sub-stations within every 47 counties, especially in areas where the radio and TV signals were weak to enhance more listenership or viewership of the audiences. According to KBC, the development is an ongoing process informed by the feedbacks received from the KBC audiences.

5.1.3 Educational Hardware in Schools

This study sought to identify the educational hardware in primary schools within Rangwe Division. From the findings, majority of the respondents confirmed that they did not have functional radio sets in their schools. Those who had few functional radio sets in their schools had the old ones like the World Space radio receivers which were either in bad conditions or not being used at all due to its high power consumptions. Also, the few functional radio sets were being used by teachers mostly to listening to news and entertainments.

Majority of schools are lacking functional radio sets because of lack of coordination between KICD and the Ministry of Education (MOE). The two main bodies and others in the education sector should put their heads together in making sure that schools have plans in place to acquire the radio sets. The radio sets are able to aid teachers and learners in the instructional learning during the Interactive Radio Lessons (IRLs).

5.1.4 The Geographical Locations of Schools

In establishing the geographical location of Rangwe Division in relation to the strengths of radio signals distributions, the findings were; majority of the respondents confirmed that they were able to receive clear KBC English service radio signals in their areas, apart from some schools within Randung zone which had poor signal receptions. The poor signal receptions were due to the topography of the area. The area lies on the leeward side within hills.

According to the KBC engineers, KBC English service radio frequency signal distribution strengths in Rangwe division, Homa Bay county is good generally, even though there are some areas or points where the signals are weak due to the type of topography in those places. The place with hills, valleys and tall trees are able to block the transmitted radio waves or signals. In those areas of poor radio signal strengths, the station carries out corrective maintenance and installations of appropriate equipment in order to help various transmission sites relay the signal which in most cases are FM signals.

KBC has FM radio coverage expansion plan countrywide to help various transmission sites relay Frequency Modulation (FM) signals. This is in view of enhancing more listenership and viewership of KBC audience. Most respondents were able to access the radio lessons through tuning to FM channel mode. The mode had got clear radio signal receptions with a more developed infrastructure around to boost the radio signal strengths in those areas.

Topography like non-plain landscape, conductive soil, hills and valleys, and tall buildings mostly in urban settlement areas interferes with signal transmissions by blocking FM signal transmissions to penetrate through. Digital platform is devoid of these challenges because its signal strength is either full or not, corresponding to the binary digits of either 1 or 0 respectively. The best solution for all these challenges in poor signal transmission according to KBC engineers is for the country to embrace digital technology by enhancing its adoption process. Others ways to handle the challenges would be to ensure highest points or sites are used for FM signals, use of gap fillers to take care of signal shadow areas and use of satellite and terrestrial transmissions to cover difficult areas.

It also came out clearly that the technical support teams both from KICD and KBC are normally working together in order to address such technical challenges. KICD periodically carries out monitoring of the radio programmes to evaluate accessibility of the radio broadcast to schools programme countrywide, even though in Homa Bay county no monitoring has been done of late.

5.1.5 Technological Know-How in Operating the Radio Sets by the End Users

The study established that most of the end users of radio broadcast to schools programmes like head teachers, teachers and learners had the technical know-how in handling of the radio sets.

From the findings, more than a half of the respondents who were headteachers and teachers confirmed that they were able to operate the radio sets without any problem as they were simple devices. The remaining ones who could not operate the radio sets wanted any new radio sets to come with operating manuals to avoid any complications in understand and operate the new sets like what happened with the World Space radio receivers. The receivers were too difficult to operate due to lack of their operation manuals in schools. This made teachers to lack confidence in operating the radio sets and even using them in teachings. Lack of technical know-how on the operations of radio sets and negative attitudes of teachers contributed to the skewed relationship, where there was high rate of awareness which was not commensurate with the rate of the usage of radio broadcast to schools programme in learning, within the division.

5.2 Contributions of Study

This study has contributed knowledge in three major areas. These are literature, theory and professional practices as discussed below.

5.2.1 Literature

The research confirms the monitoring report done by KIE (2008) and its subsequent annual productions of radio broadcasts to schools time tables (See Appendix M) showing that KBC radio signals are transmitted via Medium Wave (MW) and Frequency Modulation (FM) modes. Use of FM transmission is also in agreement with Dikshit (2002) who noted that using terrestrial FM radio transmitters has got lots of advantages. The FM radio transmitters in conjunction with satellite radio transponders can enable the global distribution of local content. FM radio when used as a teaching tool with the accommodation of text data transfer technology, the listener or receiver is able to receive delivered text via a computer network (Dikshit, 2002).

Mohammed (2013) on the challenges and opportunities in the use of radio broadcast for development in Ethiopia noted that reception quality with the use of Short Wave (SW) frequency is a challenge to people to tune to various stations. This stand was taken by Njeru (2005), where she said that listeners were currently not tuning to AM radio stations for their lack of clear signal transmissions. Thus FM radio stations are positioned as ideal mode for fulfilling a country's

educational, developmental, and socio-cultural aspirations and needs. In Ethiopia, Frequency Modulation (FM) radio stations have developed very well and are being received in almost all parts of the region. This has been due to its ease of setting the network stations (Ward, 2011).

In Kenya, some schools do not have access to radio broadcasts to schools programme and are not able to make the best use of live Interactive Radio Lessons (IRLs) due to the poor mode of transmission making the signal difficult to be received clearly (Odera, 2014; Wambaria, 2003). This position is true in some parts of Rangwe division. In Randung zone, it was found that most schools were not receiving good radio signal due to the poor mode of transmissions and other factors combined in those areas. It is now expected with the advancement in technology, every village is to be able to listen to its dialectic programmes from their community radio stations with little hitches.

In a related study Norris et al., (2003) reveal that appropriate access to technology infrastructure is another key factor in the effective technology implementation process. The study reveals substantive correlation between technology access and use in which the results obtained from this research disagree with. In the findings, the correlation was negative. Most schools had got power connectivity and yet they were not using the radio broadcast to schools programmes.

Connectivity of electricity power in the schools is a basic necessity in the diffusion of technology. It confirms the views of UNESCO (2008) that the availability of electricity power and telephony is a basic requirement in the diffusion of technology. This has been demonstrated well by the efforts that the Kenyan government is putting in place for the roll out of laptop project. The government is making sure that all the public schools in the republic are connected with electricity power grid as a basic requirement for the role out of the project.

Despite all these efforts put by the government, absolute majority of primary schools which had been connected with electricity power were not using radio broadcast to schools programme. But

the current work by the government is a positive step to the prior assertion by the Ministry of Education Science and Technology (MOEST) policy framework indicating that there were a number of challenges concerning access to and use of ICT in Kenya, including high levels of poverty, limited rural electrification, and frequent power disruptions (MOEST, 2006).

Most schools in Randung zone are not able to receive good radio signal reception which confirms the work done by Mohammed (2013) where in Ethiopia the poor radio signal reception had been necessitated by lack of relay system to receive and transmit the radio signal in some parts of the region, to ensure good quality signal receptions in those areas with poor signal receptions.

KBC as a national broadcaster was chosen for transmitting radio broadcast to schools programmes to learners all over the country because it was perceived to be a well-developed station with established infrastructural development, but still experiencing challenges in terms of having clear signal receptions (KIE, 2005; Wambaria, 2003; Odera, 2010). Some areas in the country are not able to receive clear radio signal due to lack of sub stations to be able to boost the transmitted frequencies.

Despite that, many broadcasters share the KBC broadcast infrastructure at minimal costs. This was in line with the former CCK now known as CAK directive that broadcast operators relocate their installations to common sites in order to minimize Radio Frequency (RF) effects on the population, for easier monitoring and for saving on installation costs by other stations (CCK, 2009). Even mobile providers also co-hosted with KBC to ensure faster and uniform expansion of broadcast/ GSM services to most areas of the country.

Absolute majority of the schools did not have functional radio sets, leave alone tape or CD/DVD recorders or players. They attribute this to lack of money to buy the sets. This is contrary to the assertion made by Schramm (1977) and others who said that radio sets are readily available and

reasonably cheap even for those schools in the rural areas. According to Schramm (1977) there are big differences in cost among the media tools. Computer assisted instructions cost 10 to 50 times as much as instructional television, which itself costs 3 to 10 times as much as instructional radio. But in most schools in Rangwe division, they were decrying lack of funds to buy the radio sets for teaching purposes.

Gulbahar, (2005) and MC Quail, (2005) asserted that the use of latest technological hardware and software resources is a key feature in the diffusion of technology. Most schools in Rangwe division were having radio sets but not functional. This agreed with the monitoring and evaluation report on the broadcast to schools through KBC which was done by then KIE. In the report, it was found out that in some schools radio sets were available but most of them were not functional (KIE, 2008). Abuli, et al (2013) also noted that schools in Vihiga County, Western Region lacked functional radio sets for listening to the Interactive radio Lessons despite the high availability of mains electricity power in primary schools, clearly hampering the extensive use of radios in the schools.

In Oyoo state in Nigeria teachers complain of lack of prompt distribution of educational broadcast time table making it hard for even teachers to schedule the programmes in the schools' time tables (Nzioka, 1981). This was evident in Rangwe division where schools were lacking radio broadcast to schools time table. Some schools were having time tables for 2012 on the staffroom walls and other offices.

A study which was carried out in Tharaka North Division on the factors affecting use of radio broadcast to schools confirmed the same findings other researchers such as KIE (2001), Abuli et al. (2013) and Odera (2010) came out with, showing that lesson support materials were lacking, making scheming for the radio programmes by majority of the teachers a real challenge (Dorcas et al. 2014). In some of the schools the support materials necessary for the scheming of the radio lessons were never received (Odera, 2010).

Teachers in Rangwe division could not even merge the radio broadcast time table with the schools' time tables because the current broadcast time tables were lacking in absolutely all the schools. This was a deeper setback considering KIE, (2005) monitoring and evaluation report which found out that few teachers incorporated the radio programmes in their lesson plans while most of the headteachers were using their radio sets without incorporating the programmes in the lesson plans due to lack of broadcast time tables.

Wambaria (2003) noted, the broadcast content was relevant despite the content lacking support of teachers' guides for the radio subjects for scheming purposes by the teachers. For the schools to be able to schedule their radio programme lessons in different classes, there should be broadcast time table released well in advance so that teachers are able to incorporate the radio broadcast lessons in their schools' time tables.

The topography of the area has brought a lot of disparities of the receivership of radio signal in the area where most schools in Randung zone were not able to receive clear radio signal, unlike those schools in Rangwe zone. This is in contrary to the study which was carried out by Dorcah, et al. (2014) on factors affecting use of radio broadcasting in public primary schools in Tharaka North division, Nithi district where by the majority of the respondents (96%) overwhelmingly agreed that the radio signal was clear and audible. They attributed this to partly the geographical location of the area under study as Tharaka North division is generally located on a mountainous terrain there by making the radio waves to be received well in the region. However a few schools which are located on the rare valleys in the region have got poor radio signal qualities and the radio sounds are not clear as due to poor visibility from the KBC transmitter stations.

Generally, most radio caption mode is FM because its reception is the best even in bad terrains (Kumar, 2007). This is because its signal is modulated even in those bad geographical terrains to yield good results. However, in other geographical areas they experience transmitter coverage problem (Selinger, M., 2009). According to Abul et al. (2008) the quality of signal reception in some regions is poor due to lack of visibility and far distance from the transmitters. This makes

the accessibility of radio broadcasts to schools not to be uniformly distributed during live transmissions leading to inequality in providing services like instructional education and entertainments.

In another monitoring and evaluation of schools broadcast through KBC which was done by KIE (2008), KBC signal was being received clearly. The monitoring was carried out in 14 districts in the then 8 provinces and it was clear that 87% primary schools sampled were receiving good radio signals apart from few schools which were improvising the antennas to enhance the signal reception strength.

According to Dorcas et al. (2014), they found out that an overwhelming majority of the respondents (96%) agreed that the KBC radio signal was clearly being received by schools in Tharaka North Division. The geographical location of the division is generally on a mountain terrain making radio waves to be received very clearly apart from some areas which are on the rare valleys in the region with poor reception making schools in those valley areas not to be receiving clear radio signals.

Most teachers were not confident when it comes to operating the radio sets in class. This is in support with the work done by Becta (2004) on ICT challenges. The challenges were classified in to school level barriers such as lack of time, resources, effective training, technical support and teacher level barrier such as lack of time, confidence, resistance to change, no perception benefits and lack of resources. Bengimlas (2009) also classified these barriers into teacher and school levels barriers. They included lack of access, resistance to change, lack of time, training, and technical support.

In support, Gray and Smith (2007) said that the main education managers in the schools in the 21st Century encounter myriad forces originating from technology related experiences. Andrew Moemeka noted that the teachers' attitudes in Nigeria inhibited the effective use of instructional radio.

According to Wambaria (2003) the success on the use of World Space receivers to air education radio programmes to schools rely on the technical know-how of the users who are the teachers

and learners on how to operate the receivers. Majority of the respondents 75% and 87.5% who were teachers and learners respectively indicated that they were not able to operate the receivers, whereas 25% of teachers and 12.5% of learners indicated they were able to operate the World Space receivers after a long time of struggle. Majority of the respondents who could not operate the receivers cited lack of knowledge due to no in-service training which was organized for them despite the indictment of the headteachers in those schools. The operation manuals for the receivers were very complicated even for the teachers hence they could not use the receivers in their schools to conduct live radio schools broadcast lessons. They suggested that the then KIE which is now KICD to provide technical staff to assist in operations, In- Service training to be offered and more simplified operation manual to be provided for in schools. They also suggested for a provision of user friendly antennae and if possible to be able to receive the radio broadcast to schools programmes through an ordinary radio instead of special World Space receivers.

5.2.2 Theory

The study used Uses and Gratification (U&G) and the Instruction theories.

According to the observations made in the schools, headteachers, teachers and Area Education Officers (AEOs) were reluctant to put efforts towards the use of radio broadcast to schools programmes. The feeling for them was that whether the programme was there or not learning was going on. It is a common fact that radio programmes are there to supplement learning not to take over the role of teachers. Since the satisfactions of the users or the audience are not being met, they were not keen in the implementation of the programme (Ruggiero, 2000). Audience will always like to access what they want at a particular time. When this state is taken away from them they feel deprived. Having poor radio signal is like depriving the audience the art of listening to that channel. Depriving them of these educative and informative programmes goes against the aim and purpose of the government concerning free education (MOEST, 2005; KICD,

Audiences get exposed to a medium if that medium is capable of meeting their needs. When radio reception is not received well in some schools, it becomes hard for those schools to tune to the medium when they can easily get gratified elsewhere (Palmgreen et al., 1979). This supports the reason why some teachers were using the functional radio sets to listen to other radio

channels apart from radio broadcast to schools programmes aired by KBC English service channel. Radio signal reception should be clear such that when the programmes are being listened to the audiences are not let down by poor reception or lack of power, or teaching aids. That will demoralize teachers and learners, as their gratifications sought and gratification obtained are not balanced leading to frustrations. Therefore the broadcasting infrastructure should be properly put in place and where signals are poor they should be boosted.

Prior motivations of people determine their rates of consumptions of the media content (Blumler, 1979). When schools, teachers and pupils or learners are well motivated towards the use of radio broadcast to schools programmes prepared by KICD, the degree of spread and sustainability of the listeners will be high. Teachers will keep on using radio broadcast in their teachings if their needs for gratifications sought are met. The perception should be created that influences teachers to keep on using the programmes as they realize good outputs like listening to good and quality learning programmes and learners passing well in their examinations. The instructional design one chooses should be able to achieve the good results as learners make decisions about their instructional methods, giving them alternative approaches (Reiser, 2013).

According to Mc Quail (2005) nowadays audience are active not perceive. Therefore, audience need to be able to participate in the programmes being made as they know what they want, have a choice to choose from and even create news (West & Tunner, 2004). This calls for more innovative ways of making radio broadcast to schools programme interesting, interactive and captivating to the listeners so that they feel that their needs are gratified. KICD should think of news ways of making the radio programmes to resonate well with the listeners and create other features where the audience can interact with in the programme.

The kind of design that radio broadcast to schools programme is currently using is not a loop system. The information from the learners are not being received by KICD there by denying both KICD and the learners the platform to interact and have the opportunity of knowing what is taking place with the programme. According to Reigeluth (2011) feedback definitely make learning easier and more successful.

According to Reigeluth (2011**),** instructional theories should provide guidance for customizing learning for each learner, as opposed to "one size fits all" instruction. KICD packages the programmes according to needs of the consumers, only that the Institute needs to make it known to its consumers. For those who have not listened to the programmes on air or those who have listened and would like to have copies of the programmes to go and listen to them on their own, can be able to put the request and their order done in the format that they want. The Institute packages the radio programmes in different formats according to the requests made by the clients. The radio lessons can be package on a CD, audio tapes and even on DVDs.

Uses and Gratification, and Instruction theories were relevant to the study as they brought out clearly how the learners or audience at large are supposed to be gratified and maintained in this current world where radio broadcast to schools programme being aired through KBC English channel compete along with many radio programmes from different channels in the country.

5.2.3 Professional Practice

Kenya Institute of Curriculum Development (KICD) is a government institution charged with the responsibility of providing quality curricula and curriculum support materials responsive to the needs of the society. Broadcasting radio lessons to schools and having educative informative programmes to the general public, is one of the ways the Institute provides curriculum support materials responsive to the needs of the society (KICD, 2013). Being a centre of excellence in transformative and globally competitive curriculum, KICD should mirror its actual outputs and the levels of outcomes in the radio programmes as a measure in its achievements in line with its mission and core functions.

Going by the previous research, radio broadcast to schools programme is dying a slow death. Urgent measures should be put in place to resuscitate the programme from its death bed. The corporate identity of the Institute should be a reflection of reality as corporate culture manifests itself in management culture. With poor delivery from the management, the turnaround strategy for the success of radio broadcast programme should often start with dismantling the existing

culture of leadership (Raimo W. Normi et al. 2010). According to Harold Koontz et al. (2010) leadership is the art or process of influencing people so that they will strive willingly and enthusiastically towards the achievement of the organization's goals. Having the right leadership in the running of the programme will be able inject new experience in management and the cultural orientation necessary for the success of the radio programme. For organization to strive towards excellence, Raimo W. Normi and John R. Darling (2010) say:

> The organization must first take good care of its customers [audience] via superior product quality and exceptional services. The organization must also constantly innovate. These are basic to achieving long term superior performance and to sustaining a strategic competitive market advantage (Pg.53).

It is always good practice to be able to share information with relevant institutions. Given the core mandate of the Institute, it is important for KICD to be in the global map competing with the rest of the world as it discharges its mandate. The management of the Institute should make sure that information is flowing freely for healthy interactions and development in this 21st century where innovations and technology are the propelling keys to greater heights.

KICD should be able to develop a participatory approach in the running and management of radio broadcast to schools programme. For the use of interactive radio lessons in classes by teachers, let the levels of communication be horizontal where teachers also feel that they own the radio programmes. With this teachers and even learners will be able to inform the Institute of any kind of new occurrences or anything that needs to be addressed. The users will be able to embrace the use of radio instructions in schools and go extra miles in making sure that the use of this kind of technology succeeds and achieve its goal in the long run.

Monitoring and evaluation should be encouraged by KICD management to be able to measure the levels of success of any programme run by the Institute like the radio broadcast to schools programme. This can form part of publicizing the activities of KICD and putting its image to the

outside world. Monitoring and evaluation needs to be done regularly in order to be able to measure the success of the programme and know exactly what to do as you compare the previous ones with the current monitoring to come up with the way forward. Any challenges encountered should be addressed promptly with the levels they deserve. Not doing so is not solving any problem but only carrying the unresolved problems forward.

5.3 Conclusions

On the basis of the outlined findings, the following conclusions were drawn;

Radio broadcasts to schools programme was introduced in 1960's by the Kenyan government. Its aim was widening accessibility to education, improving quality education, diffusing superior teaching methods to serving teachers and training of teachers at lower cost (MOEST, 2004). The radio lessons are very interactive providing learners with opportunities to interact with the radio teachers in the programmes. This national priority has not been able to meet its aim due to some technological challenges being faced by schools in its accessibility and use.

Based on the objectives and the findings of the study, the modes of transmissions of KBC radio broadcast to schools programme are two; Frequency Modulation (FM) and Medium Wave (MW) modes. This kind of information should be made available to headteachers and teachers not only through the broadcast time tables but also through other fora.

KBC infrastructure complementing radio broadcasts to schools programme is in place but more work need to be done. The educational hardware which is normally accompanied by its software is not available in schools. The radio reception signal strengths in relation to the topography of Rangwe division is varied with Randung zone getting poor radio reception signal quality while Rangwe has got good radio signal reception quality. Therefore, there is the need for KBC to boost the radio signal strengths in those areas with poor radio signal receptions.

Most end users who operate radio sets like the teachers have technical know-how on the operations of simple radio sets. However, there is need for teachers to be trained on the use of instructional technology in schools for them to be able to embrace the use of technology in schools.

KICD needs to carry out effective promotional activities for the radio broadcasts to schools programme. There is need for more sensitizations to be carried out in schools for its effective use. The stakeholders of radio broadcasts to schools programme like KBC, KICD, AEOs or TAC Tutors, school heads and other education sectors should liaise and work together in coordination, to achieve the common goal of the programme, which is equal education for all.

5.4 Recommendations for Future Studies

According to the objectives and the analysis of the research study, the study recommends that;

5.4.1 Sensitization and Awareness

KICD should be able to increase the rate of accessibility of radio broadcast to schools programme by creating more awareness and sensitizing schools on the use of radio broadcast to schools programme. Mounting awareness campaigns by KICD and KBC will be able to sensitize schools on the transmission modes of radio broadcast to schools programme such that when they would like to listen to the programmes, they know of the channels to tune in to. In the study, it was found out that most users were not aware of the channel of transmission after KICD switched off from World Space transmissions in 2007 to KBC in the same year. When teachers responded by saying that they did not know whether the broadcast was still through World Space or KBC, it defeats ones understanding of what happened when KICD moved the transmission of their radio programmes from World Space to KBC. Seemingly, KICD and the radio programmes moved to KBC but most teachers and headteachers never moved. The move should have been in sync with the consumers or the end users of the programme. The lack of awareness due to no information passed to the audience makes the audience to be vulnerable and able to switch to other stations (MC Quail, 2005). The station or the programmes therefore loses audience at the end which is actually happening.

In the analysis according to the data gathered, it emerged that absolute majority of the users of radio broadcasts to schools programme were aware of the transmission of radio broadcasts to schools programme, but lacked some crucial information on the same. Some of the users did not know that it is not the responsibility of KICD to provide schools with radio sets, but the responsibility lies squarely with the schools' administrations. Such kind of information should be

made available to the relevant authorities in schools. It is the responsibility of KICD together with the Ministry of Education to make sure that such information is received by the relevant authorities like the headteachers and teachers in good time for quick and easier adoptions of radio broadcast to schools programme.

5.4.2 Electricity power Connections

The Kenyan government through its support on radio broadcasts to schools programme should increase the rate of power connectivity in the remaining schools within the country to be able to facilitate the use of other teaching or instructional methods. With good electricity power connections in schools and the environs even the digital laptop project will be easily implemented when the infrastructures in schools are well developed. Radio sets consume less power hence easy for schools to maintain. The analyzed data brought out clearly the need for power connectivity in schools and making the connections operational. In the analysis, most schools were connected to the electricity power, but were not able to use the power due slow pace by the government when it came to commissioning the completed projects. It is therefore important for the government to make sure that those schools which have been connected to the electricity power grid are commissioned and are using the electricity power. Therefore, government should remove the bureaucratic tapes involved in the commissioning process. In the adoption of any technology, infrastructural development is vital in its acceptance and it accelerates the use of the technology like the educational instructions modes like in the use of radio sets and computers.

5.4.3 Radio Sets

Through the Ministry of Education Science and Technology (MOEST), schools should be encouraged to buy radio sets and other relevant software materials. For the ministry to do this, it should have the laid down modalities of how schools can be able to acquire such facilities and materials. One of the ways to do this is by the ministry to provide schools with some allocations in the Free Primary Education's (FPE) funds for the purchase of radio sets. Another one is for the school heads to source for funds to by the hardware and the relevant software for their schools. Most schools sampled had no functional radio sets. Those schools which had the functional radio

sets were few and most of them were having World Space radio receivers which they could not utilized properly due to the fact that the radio receivers were worn out and were proving difficult to operate. According to Gulbahar (2005) it is always good for the use of technology like radio in instructional education for the users to have up-to- date hardware and software resources which are key features in the diffusion of any technology. In recent years, most of the schools were not equipped with different kinds of technological infrastructure and electronic resources available and now that has changed due to the rapid evolutional changes taking place in the technology. Even if there is still the use of old technology, it has to be compatible with the new technology. Indicators for good adoption rate of any technology in the market are; the availability of the technology in the market and its ownership or acquisition by the end users or the adopters amongst others. In the case of radio broadcast to schools programme, the technology has been inexistence for quite a long time which should right now bring with it its sustainability and relevance in the education sector. This would be able to attract even the laggards to come and join the early adopters (MC Quail, 2005).

5.4.4 Broadcast Time Tables

KICD should provide schools with broadcast time tables promptly and be able to advocate for schools to have teachers' guides for good scheming of the radio lessons. From the observations made, none of the schools visited had the current 2015 broadcast time table. Most of them did not even have the old broadcast time tables. Those few schools which had the old broadcast time tables were those time tables of 2012. The purported new ones were those of 2014 pinned on either the staffroom walls or headteachers' offices.

If there is a new trend being used to distribute broadcast time tables, let KICD inform the schools how they can be able to get the time tables through those new trends. KICD currently attaches broadcast time tables on the Institute website so that those who are in need of it like schools can be able to download the broadcast time table and access any relevant information. But do the headteachers and teachers all over the republic know about the KICD website and how many could be able to download those time tables from the websites? These are issues which need to be addressed by KICD.

In order for them to be able to solve such kind of problems, there should be multi-sectoral approach put in place by KICD to make sure that all schools within the country are able to get broadcast time tables promptly before the beginning of the education calendar year. Schools can only be able to effectively use the broadcasts time tables when at the beginning of the year they are able to incorporate the broadcast time tables into their own schools' time tables for easier implementation processes. According to Dias and Atkinson (2001) integrating technology into curricula with the aim of positively influencing teaching and learning has been in a state of evolution over the past so many years. This integration has been driven by hardware and software evolution, accessibility to radio sets and computers in the educational settings, and popular instructional technology trends. Technology integration has covered the continuum from instruction of programming skills, self-directed drill and practice, interactive learning software, online training, testing, instructional delivery augmentation, and internet based accessibility to information, communication, and publication (Dockstader, 1999; Dias, & Atkinson, 2001). KICD should be able to make any vital information concerning radio broadcast to schools programme available to the audience. The headteachers, teachers and even learners who are not aware of how to get radio broadcast time tables, should be able to know where they can be able to get the broadcast time tables without delay. This can only be through KICD relying relevant information to the programme users.

5.4.5 Information Sharing

There is need for KBC to be involved in the monitoring of the radio broadcast to schools programme which is carried out by KICD periodically. As a transmitting station charged with the responsibility of broadcasting the radio programmes, there is need for the station to also evaluate the radio signal strengths in different regions within the country. Where the KBC radio signal strength is low, they should be able to boost the signals by building or upgrading their infrastructure. In Rangwe division, the research done found out that in Randung zone the radio signal strength is low, hence poor signal receptions in the schools within the zone. This has hampered the use of radio broadcast to schools programme mostly in Randung zone. KICD had carried out some monitoring and evaluation activities for the radio broadcast to schools programme, but none had got the participation of the transmitting station, KBC. Whether the recommendations concerning the signal distribution strengths that came out in the monitoring

reports are reaching KBC no one can attest to that. Therefore for proper accountability and effective relay of information, it is good if KBC engineers or technical staff with the blessing of their management know and take part in the same activities of monitoring the radio broadcast to schools programme.

5.4.6 Trainings

KICD should be able to involve the users of the radio broadcast to schools programme like teachers in trainings so as to be part and parcel of the programme, for quick adoption and use. The radio sets are simple tools that teachers should be able to operate with ease. Teachers should be able to get acquainted with the operations of any new radio set by referring to their operation manuals. Where technical know-how in terms of operations is becoming an impediment, KICD should conduct orientation programmes for teachers. According to a research work which was carried out by Baylor and Ritchie (2002) looking at the factors facilitating teachers on the use of technology and education programmes, they found out that professional development had a significant influence on how well use of instructional technology is embraced in classroom by teachers and other instructors. Teachers training programmes should be scaled up to be able to meet the challenges of the 21st century as instructional technology orientations are evolving rapidly becoming the order of the day.

The reason teachers sometimes feel jittery when faced with any instructional technology in schools might be due to the kind of training they underwent. Teachers training programmes may have be used to focus more on basic literacy skills and less on the integrated use of ICT in teachings. Due to this, you find that the numerous plans which have been made towards the use of instructional technological tools in schools are not successful. According to Varsidas and McIsaac (2001) this trend can be because of lack of requisite skills and knowledge in the new areas of instructional technology. On technology based instructions, Schaffer and Richardson (2004) noted that when technology was introduced into teacher education programmes, the emphasis was often made on teaching about technology instead of teaching with technology which led to inadequacy in the preparations of the use of technology like radio sets and computers in schools. Teachers need to be given equal opportunities like any other practitioner to

practice using new technological inventions during their teacher training programmes so that they can develop ways in which technology can be used to augment their classroom activities (Rosenthal, 1999). Teachers are more likely to integrate ICT in their courses, when professional training in the use of ICT provides the time to practice with the technology and to learn, share and collaborate with their colleagues and even learners.

According to Pelgrum (2001), the success of educational innovations depends largely on the skills and knowledge of teachers. He also found out that lack of knowledge and skills was the second most inhibiting obstacles to the use of computers in schools. Similarly, in the United States, Knezk and Christensen (2000) hypothesized that high levels of attitude, skills and knowledge, and tools in terms of level of access, would produce higher levels of technology integration that would reflect on student achievements positively. Their model postulated that educators with high levels of skills, knowledge and tools would exhibit higher levels of technology integrations in classrooms. Moreover, Berner (2003) studied the relationship between the computer use in classrooms and seven independent variables like perceived relevance, desire to learn, emotional reaction to technology, administrative support, and peer support. He found out that the faculty's beliefs about computer competence were the greatest predictor of their use of computer in the classrooms. Therefore teachers should develop their competence based on the educational goals they wanted to accomplish with the help of ICT. Carrying teachers and learners on board in the running of radio broadcast to schools programme is one of the positive indicators towards the accelerated use of the radio programmes as supplementary learning materials in schools by teachers.

5.5 Areas for Future Research

This study proposes further research work to be done in the following areas:

Awareness and sensitization of radio broadcast to schools programme on the users. The level of awareness is high currently which is not commensurate with the levels of the use of the radio programmes in schools. Therefore there is need for sensitization on the same as this will also boost the levels of awareness leading to increase in the use of the technology in learning.

Carrying out awareness and sensitization will go a long way in monitoring the progress of radio broadcast to schools programme and informing the players of what course of actions to take to boost the accessibility of radio broadcast to schools programme.

TV broadcast to schools programme, for instance the case of KICD's EDU Channel. Kenya Institute of Curriculum Development (KICD) also operates a television channel just like the radio channel. It is prudent to also look at the progress of the TV so as to be able to compare the findings. Comparing different findings will help KICD to know what strategy can work and not work for the two stations as they look for the way forward. Comparative studies normally give you solutions which were never forthcoming.

The relation of ICT policy in radio broadcast to schools programme. Whether the policy affects positively or negatively the use of radio broadcast to schools programme. Radio being one of the tools of ICT, it is of equal importance to still look at the relations of the ICT policies in the development of radio broadcast to schools programme. This will help in knowing whether the policies are able to affect radio as a tool directly or indirectly and the reasons behind effects, if any.

BIBLIOGRAPHY

A. T. Alabi. (2007). Techniques of Data Presentation, Interpretation and Analysis. Essay Work. Department of Educational Management, University Of Ilorin, Ilorin. Source: http://www.ilorin.info/kwsubeb/data-collection-collation-analysis/Workshop_Paper_at_Queen_School.pdf

Adebayo, O.A. (2000). Understanding Statistics. Lagos: JAS

Adeogun, A. A. (2001). The Principal and the Financial Management of Public Secondary Schools in Osun State. Journal Of Educational System and Development , Vol. 1-10.

Agrawal, B. (2005). Educational Media in India. In U. Reddi & S. Mishra (Eds.) *Perspectives on Distance Education: Educational Media in Asia*. Vancouver, BC: Commonwealth of Learning. http://www.col.org/colweb/site/pid/3329

Ajzen, I. (1991). The Theory of Planned Behavior, "Organizational Behavior and Human Decision Processes", Vol. 50, pp 179-211.

Alabi, A.T. (1999). Effective Utilization of MIS for Decision Making in Nigerian Universities. Unpublished Ph.D thesis: University of Ilorin, Ilorin.

Anderson, J., & Poole, M. (2001). Assignment and Thesis Writing (4th Ed.). John Wiley& Sons: Australia, ltd.

Anderson, R .E., & Ronnkvist, A . (1999). The Presence of Computer in America Schools: Teaching, Learning and Computing: 1998 National Survey(Report# 2). Irvine, CA: Center for Research on Information Technology and Organizations. (ERIC Document Reproduction Service No. ED 430 548).

Andrea, Bosch. (1997*). Interactive Radio Instruction: Twenty-Three Years of Improving Educational Quality.* The World Bank Human Development Department Education Group - Education and Technology Team: 1818 H Street, N.W. Washington, D.C. 20433, U.S.A.

Ayieke, A. (2005). *Free Primary Education in Kenya: Examining the Benefits, Challenges and Sustainability.* Part of a report on the Millennium Development Goals Project Database pg 1-22 *(sl).*

Baggaley,J., & Ng, M. (2005). PANdora's Box: Distance Learning Technologies in Asia. ***Learning, Media and Technology, 30***(1), 5-14.

Bandura, A. (1977). Self-Efficacy: Toward a Unifying Theory of Behavioral Change. *Psychological Review*, 84, 191.215.

Banerjee, Abhijit., Rukmini, Banerji., Esther, Duflo., Rachel, Glennerster., & Stuti, Khemani. (2010). Pitfalls of Participatory Programs: Evidence from A Randomized Evaluation in Education in India, *American Economic Journal: Economic Policy* 2(1): 1-30.

Bell, J. (2005).*Doing Your Research Project: A Guide for First-Time Researchers in Education, Health and Social Science* (4thed.).London: Open University Press.

Bernard, Nnamdi, Emenyeonu. (2005). Media Uses and Gratification: A review. Department of Mass Communication, University of Nigeria,Nsukka.

Bett, J. (2008). Classroom Interaction in English Language Classes in Public Secondary Schools in Kericho Municipality. Unpublished Med Thesis. Maseno : Masaeno University

Bhattacharya, I. & Sharma, K. (2007), 'India in the Knowledge Economy–An Electronic Paradigm', *International Journal of Educational Manage*ment Vol. 21 No. 6, Pp. 543- 568.

Björkman, Martina. (2006). Does Money Matter for Student Performance? Evidence from a Grant Program in Uganda, Working Paper No. 326. IGIER, University of Bocconi, Milan, Italy

Blakely, R.J. (1979). To Serve The Public Interest: Educational Broadcasting in the United States. Syracuse, N Y: Syracuse University Press.

Blumler, & E. Katz (Eds.). *The Uses of Mass Communications: Current Perspectives on Gratifications Research* (pp. 249–268). Beverly Hills, CA: Sage.

Blumler, J. G. (1979). The Role of Theory in Uses and Gratifications Studies. *Communication Research, 6,* 9–36.

Blumler, J. G., & McQuail, D. (1968). *Television in Politics: Its Uses and Influence.* London: Faber and Faber.

Bosch, A. (2004). *Interactive Radio Instruction: Twenty-three Years of Improving Education Quality*. Washington DC: World Bank.

Bosch, A. (2004). Sustainability and Interactive Radio Instruction: Why Some Projects Last. In D. Chapman & L. Mahlck (Eds.) Adopting Technology for School Improvement: A Global Perspective Source: http://www.unesco.org/iiep/PDF/pubs/F165.pdf#page=149

Bosch, A. (2007). Sustainability and Interactive Radio Instruction: Why Some Projects Last. In D. Chapman & L. Mahlck (Eds.) Adopting Technology for School Improvement: A Global Perspective Source: http://www.unesco.org/iiep/PDF/pubs/F165.pdf#page=149

British Broadcasting Corporation. (1993). *Survey of Broadcasting Use 1992/3: Primary Schools. Tables of Results and Technical Appendix* (Broadcasting Research Tracking Report 93/74). London.

Bruce, L. Berg. (2006). Qualitative Research for the Social Sciences (6th Ed.). Allyn & Bacon Publishers. Inc.

Butcher, N. (2003). Technology Infrastructure and Use of ICT in Education in Africa: An Overview. Paris: ADEA. Source: http://www.adeanet.org/publications/pdf/dol-ICT_eng.pdf

Carless, M. (2009). Synergizing Technology with Cognition and Pedagogy: A Framework for Designing E-Learning Programs. *Paper Presented in the National Conference of the Philippine E-Learning Society*, 1-2 August. Manila.

Carol, M. Roberts. (2004).The Dissertation Journey: A Practical and Comprehensive Guide to Planning, Writing and Defending Your Dissertation. Corwin Press; A Sage Publication Company, Thousand Oaks, California.

Carolyne, Sharp. (1995).Viewing Listening Learning. *The Use and Impact of Schools Broadcasts*. Source: https://www.nfer.ac.uk/publications/91036/91036.pdf

Chandar, U., & Sharma, R. (2003). Bridges to Effective Learning Through Radio**.** *The International Review of Research in Open and Distance Learning, 4*(1). Source: http://www.irrodl.org/index.php/irrodl/article/view/118

Chandran, C. (2004). Research Methods: A Qualitative Approach with Illustrations from Christian Ministries. Nairobi: Daystar University.

Chapman, & L. Mahlck. (Eds.). (2005). *Adapting Technology for School Improvement: A global perspective.* International Institute of Educational Planning (IIEP), UNESCO.

Chapman, David, W, Ed, & Lars,O., Ed. (2004). Adopting Technology for School Improvement: A Global Perspective. International Institute of Educational Planning (IIEP), UNESCO.

Charlie, Reigeluth. (2011). What is the New Paradigm of Instructional Theory. IT Forum Paper (#17). Indiana University.

Chaudhary, S. S. (1996). *Current Trends, Methods and Technologies in Distance Education for Primary School Teachers*. Working paper. Vancouver: Commonwealth of Learning.

Chava, Frankfort-Nachmias., & David, Nachmias. (2000). Research Methods in Social Sciences (6th Ed.). Worth Publishers & St. Martin's Press; New York.

Choat, E., & Griffin, H. (1989). Using Television in the Primary Schools. London: Routledge

Christen, P. (2008). Teaching English by Radio Interactive Radio in Kenya. *Development Communication Report 49: 3-4.*

ChuttuR, M.Y. (2009).”*Overview of the Technology Acceptance Model: Origins, Developments and Future Directions,”* Indiana University, USA. Sprouts: Working Papers on Information Systems, 9(37).Retrieved from: http://sprouts.aisnet.org/9-37.

Communication Commission of Kenya (CCK). (2009). Kenya Information and Communications, Act No. 1 of 2009. Government Printers, Kenya.

Creswell, J.W & Clark V.L.P. (2007). Designing and Conducting Mixed Methods Research: Mixed Methods Research .Thousand Oaks, California: Sage Publications Inc.

Creswell, J.W. (2009). Research Design: Qualitative, Quantitative and Mixed Methods Approach (3rded.).London: Sage Publications Inc.

Cuban, L. (1999). *The Lure of Curricular Reform and its Pitiful History*. Phi Delta Kappan, 75(5), 182–185.

D. Chapman., & L. Mahlck. (Eds.). (2005). Adopting Technology for School Improvement: A Global Perspective. Retrieved from: http://www.unesco.org/iip/PDF/F165.pdf

Daily Nation Mobile News. (2014). Nairobi, Homa Bay and Kisumu Still at the Top of HIV Infection Charts. Posted: Tuesday, July 22, 2014 By- Samuel Siringi. Source: http://mobile.nation.co.ke/news/nairobi-homa-bay-kisumu-hiv-infection-report/-/1950946/2393814/-/format/xhtml/-/3sy46tz/-/index.html

Davis, F.D. (1986). A Technology Acceptance Model for Empirically Testing New End-User Information Systems: Theory and Results, Sloan School of Management, Massachusetts Institute of Technology.

Davis, F.D. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, "*MIS Quarterly*", Vol. 13, No. 3, pp 319-340.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1989). User Aceptance of Computer-Technology - A Comparison of 2 Theoretical-Models, "*Management Science*", Vol. 35, No. 8, pp 982-1003.

Davis, N.E., & Tearle, P. (Eds.). (1999). A Core Curriculum for Telematics in Teacher Training. Available: www.ex.ac.uk/telematics.T3/corecurr/tteach98.htm

Dawson, R. Hancock, & Bob, Algozzine. (2006). Doing Case Study Research: A practical Guide for Beginning Researchers. Teachers College Press, Columbia University; New York.

DeFleur, M. L., & Ball-Rokeach, S. (1982). *Theories of Mass Communication* (4th ed.). New York: Longman.

Defleurs, M. L. & Dennis, E. E. (1991). Understanding Mass Communication: New Delhi: Goylsaab.

Development in Deeds (DID). (2007). *Interactive Radio Instruction: Impact, Sustainability and Direction. World Bank and DID.*

Dikshit, H. P. (2002). Preface to study: *Radio Vision (Multimedia through Digital Radio)*. In Sreedher, *Radio Vision: Multimedia through Digital Radio*. UNESCO and IGNOU.

Dinkelman, T., Lam, D., & Leibbrandt, M. (2007). Household and Community Income, Economic Shocks and Risky Sexual Behavior of Young Adults: Evidence from the Cape Area Panel Study 2002 and 2005. *AIDS 21(Supp. 1)*: S49-S56.

Dock A., & Helwig, J. (1999). *Interactive Radio Instruction: Impact, sustainability and direction. World Bank and USAID*. Source: http://www.techknowlogia.org/TKL_active_pages2/CurrentArticles/main.asp?FileType=PDF&ArticleID=46

Dominick, J. R. (2005). The Dynamics of Mass Communication: Media in Digital Age. Boston: McGraw-Hill.

Dorcah, Asiago., Abraham, Mugambi. & Genevieve, Wanjala. (2014). Factors Affecting Use of Radio Broadcasting in Public Primary Schools in Tharaka North Division, Tharaka District. *International Journal of Education and Research Vol. 2 No. 6 June 2014*

Dubber, Andrew. (2013). DMS - Digital Media and Society: Radio in the Digital Age. Wiley: Oxford, GBR.

Dubridge, N. (2004). Audio Cassettes in Bates A. W. (ed). *The Role of Technology in Distance Education*. London: Cruon Helm.

Durosaro, D.O. (1997). Statistical Needs for Educational Planning in Nigeria. Ibadan: Reginalson.

Elliott, P. (1974). Uses and Gratifications Research: A Critique and a Sociological Alternative. In J. G.

Engoloa, Rosalie. (1985). 'Educational Broadcasting in Uganda', *COMBROAD Commonwealth Broadcasting Association,* No. 67, 1985, pp. 20-23.

Everret, M. Rogers. (2003). Diffusion of Innovation Theory. (5th Ed.). The Free Press, A Division of Simon & Schuster, Inc: New York, NY 10020.

Fiddler, M. (1992). Developing and Implementing a Distance Education Secondary School Program for Isolated First Nations Communities in Northwestern Ontario. Source: http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/14/ba/88.pdf

Finn, J.D. (1972). The Emerging Technology of Education. In R.J. McBeath (Ed.), Extending Education through Technology: Selected writings by James D. Finn. Washington,D C: Associationf or Educational Communications and Technology.

Fleming, T & Toutant, T. (1995).”A Modern Box of Magic”: School Radio in British Columbia, 1927-1984.*Journal of Distance Education, 10*(1), 53-73.Retrieved from http://www.jofde.ca/index.php/jde/article/view/226/603.

Florence, Odera., Abul., & Wellington. (2013). *The Impact of Chemistry School Radio Broadcast in Secondary Schools in Vihiga County, Western, Kenya*: *ICT Journal, Vol.3 No.1, January 2013*. Available; hptt://www.esjournals.org

Forsyth, I. Jolliffe, A., & Stevens, D. (1999). Preparing A Course: Practical Strategies for Teachers. Lecturers and Trainers. London: Kogan Page.

Fred, C. Lunenburg. (2010). Schools as Open Systems. *Journal Article: Schooling Volume 1, Number 1, 20101.* Sam Houston State University.

Gay, l., & Arasian, P. (2003). Educational Research: Competencies for Analysis and Applications. Upper Saddle River. New Jersey: Merrill PrenticeHall.

Gay, L.R.., Mills, G.E., & Airasan, P. (2009). Educational Research, Competencies for Analysis and Applications (9th ed.). New Jersey: Pearson Education, Inc.

George, D., & Mallery, P. (2003). SPSS for window Step by Step, (4th Ed.). Boston, MA: Allyn and Bacon.

Gillespie, S., Greener, R., Whiteside, A., & Whitworth, J. (2009). Investigating the Empirical Evidence for Understanding Vulnerability and the Associations Between Poverty, HIV Infection and AIDS Impact. AIDS, 21 (suppl. 7): S1–S4. http://www.aidsonline.com/pt/re/aids/pdfhandler.00002030-200711007-00001.pdf;jsessionid=JhzHJ12rqkwyPfvpml6LLkFy7QpY11JTLv4dv3Ml7QDvPk4MBKpW!- 1429555639!181195629!8091!-1

GoK. (2005). Kenya: Consultative Group Meeting. Joint Donor Statement on Education, April 2005:Source: http://siteresources.worldbank.org/INTKENYA/Resources/donor_statement_legal.pdf

Greenberg, B. S. (1974). Gratifications of Television Viewing and their Correlates for British Children. In J. G. Blumler & E. Katz (Eds.), *The Uses of Mass Communications: Current Perspectives on Gratifications Research* (pp. 71–92). Beverly Hills, CA: Sage.

Greenberg, B. S., & Dominick, J. (1969). Race and Social Class Differences in Teenager's Use of Television. *Journal of Broadcasting, 13*(4), 331–344.

Gulati, S. (2008). Technology-Enhanced Learning in Developing Countries. *International Review of Research in Open and Distance Learning, 9* **(1).** Source: http://www.irrodl.org/index.php/irrodl/article/view/477/1012

Harold, Koontz., & Heinz, Wechrich. (2010). Essentials of Management: An International Prospective (ED). Tata McGraw Hill Education, Private Limited. New Delhi.

Heinich, R., Molenda, M., Russell, J.D., & Smaldino, S. E. (2002). *Instructional Media and the New Technology of Instruction*. New York: Macmillan.

Hodes, C. (1995). *Directions for Higher Education in the People's Republic of China*. ERIC Document No.: ED385249

J. K. Das. (2015). Educational Broadcast Through Radio. Source: http://aiaer.net/ejournal/vol19107/8.htm

James, Kiwanuka- Tondo. (2006). Educational Broadcast in Africa: The Case of Uganda. Uganda Schools of journalism, Kampala. Source: http://archive.lib.msu.edu/DMC/African%20Journals/pdfs/africa%20media%20review/vol4no2/jamr004002006.pdf

Jegede, O. (2002). *An Integrated ICT-Support for ODL in Nigeria: The Vision, the Mission and the Journey so Far*. Paper presented for the LEARNTEC-UNESCO 2002 Global Forum on Learning Technologies. Karlsruhe, Germany. Retrieved from http://portal.unesco.org/es/files/2828/1023182434jegede.pdf/jegede.pdf

Johnson, B., & Christensen, L. (2008). Educational Research: Quantitative, Qualitative and Mixed Approaches (3rd ed.). Thousand Oaks, California: Sage Publications.

Jwan, O.J. and Ong'ondo C.O. (2011).Qualitative Research: An introduction to Principles and Techniques. Moi University Press.

K.I.C.D. (2013). Kenya Gazette Supplement No. 11 (Acts No. 4, 2013). National Council For Law Reporting. Nairobi, Kenya.

K.I.E. (2007). The curriculum watch: Educational broadcasting in Kenya. Journal of Kenya Institute of education (KIE); Vol.1 Issue 1 June, 2007.

K.I.E. (1976). Schools Broadcasting: The past and the Future, Report submitted to the national committee on Educational Objectives and Policy. Nairobi: KIE

Katz, E, Gurevitch, M. and Haas, H. (1973) "On the Use of Mass Media for Important Things", *American Sociological Review*.

Katz, E. (1960). The two-step flow of communication. In W. Schramm (Ed.), *Mass communications* (pp. 346–365). Urbana: University of Illinois Press.

Katz, E. (1987). Communication Research Since Lazarsfeld. *Public Opinion Quarterly, 51,* 525–545.

Katz, E., & Foulkes, D. (1962). On the Use of Mass Media as Escape: Clarification of A Concept. *Public Opinion Quarterly, 26,* 377–388.

Katz, E., & Lazarsfeld, P. F. (1955). *Personal Influence: The Part Played by People in the Flow of Mass Communications.* Glencoe, IL: Free Press.

Katz, E., Blumler, J., & Gurevitch, M. (1974). Utilization of Mass Communication by the Individual. In J. Blumler & E. Katz (Eds.), *The Uses of Mass Communication: Current Perspectives on Gratifications Research* (pp. 19–34). Beverly Hills, CA: Sage.

Katz, E., Blummer, J.G. and Gurevitch, M. (1974) "Uses and Gratifications Research", *Public Opinion Quarterly*, 23: 389 - 398.

Katz, E., Gurevitch, M.,&Haas, H. (1973). On the Use of the Mass Media for Important Things. *American Sociological Review, 38,* 164–181.

Kaul, A. K. (2008). *Role of Electronic Media in Modern World*. ADB Publishers.

Keefer, Philip. (2007). Clientelism, Credibility and the Policy Choices of Young Democracies. *American Journal of Political Science* 51:4, 804-821 (October).

Kenya 2010; Towards A Globally Competitive Quality Education for Sustainable Development, Government Printer 2012

Kenya Forum. (2013). Counties most hit by HIV?AIDS in Kenya. Source: http://www.kenyaforum.net/2013/07/29/counties-most-hit-by-hivaids-in-kenya/

Kenya Institute of Education. (1999). *Evaluation of Modes of Transmitting Education programmes to Schools and Colleges. Nairobi:* Kenya Institute of Education.

Kenya Institute of Education. (2001/2). *Pilot study report of World Space radio broadcast to schools*. Kenya institute of Education.

Kenya Institute of Education. (2005). *Monitoring of Schools Broadcast through World Space in Primary Schools. KIE Research series No. 78, Nairobi*: Kenya Institute of Education.

Kenya Institute of Education. (2008). *Report on Monitoring of Broadcast to Schools through KBC. KIE Research series No. 88, Nairobi:* Kenya Institute of Education.

Kenya National Examinational Council. (2013). Poverty level and performance of students in KCPE. KNEC, Kenya

Keriga, L. (2009). Social Policy, Development and Governance in Kenya: An Evaluation and Profile of Education in Kenya: Development Policy Management Forum (DPMF)

KIE Vol 1: Nairobi.

KIE, (1984). Radio Language Arts projects: An Evaluation Report. Nairobi: KIE

KIE, (2015). EMS Broadcasting to Schools Timetable. Nairobi: KIE

Kinyanjui, L. (1997). Availability and Utilization of Instructional Media in the Teaching of Physical Education in Primary Teacher Training Colleges. Unpublished. M.Ed Thesis, Kenyatta University.

Kinyanjui, P.E. (2006). The Organization of Teacher Training at A Distance with Particular Reference to Kenya. Washington: World Bank.

Kiruhi., et al. (2009) Methods of Instruction: A guide for Teachers and Teacher Education. Nairobi: Kijabe.

Klapper, J. T. (1960). *The Effects of Mass Communication.* New York: Free Press.

Klapper, J. T. (1963). Mass Communication Research: An Old Road Resurveyed. *Public Opinion Quarterly, 27,* 515–527.

Kothari, C. R. (2004). Research Methodology: Methods and Techniques (2nd Ed.). New Age International Publishers; New Delhi, India.

Kumar, K. L. (1997). Educational Technology, New Delhi: New Ages Publishers.

Kumar, R. (1996). Research Methodology: *A Step-By-Step Guide for Beginners*. Sage Publications: London.

Kumari, S. (Ed.) (2004). *Increasing Role of Technology in Education*. Delhi: Isha Books.

Legris, P., Ingham, J., & Collerette, P. (2003). Why People Use Information Technology? A Critical Review of Technology Acceptance Model. *Information & Management, 40, 191-2004.*

Lemke, C., & Coughlin, E.C. (1998). Technology in American Schools. Available: www.mff.org/pnbs/ME158.pdf.

Li, G. & Ni, X. (2011). Primary EFL Teachers Technology Use in China: Patterns and Perceptions. *RELC Journal 42(1), 69-85*. Retrieved from http://rel.sagepub.com/content/42/1/69.

Li, Q. (2007). Student and Teacher Views about Technology: A Tale of Two Cities. *Journal of Research on Technology in Education, 39*(4), 377-397.

Louis, Cohen. & Michael, Holliday. (1996). Practical Statistics for Students: Presenting Data. SAGE Publications Ltd, London.

Lull, J. (1991). *China Turned On: Television, Reform and Resistance.* London: Routledge.

Lull, J. (1995). *Media, Communication, Culture: A Global Approach.* New York: Columbia University Press.

Mainye, S. O. (1985). Radio Broadcasting to Schools: An Evaluation of the Effectiveness of Radio Programmes in Teaching English Language to Lower Primary Pupils-Standard Three in Njoro Division, Nakuru Count-Kenya. Kenya.

Makewa, L., Role, E., & Nyamboga, R. (2011). *International Journal of Education and Development Using Information and Communication Technology* (IJCDICT) 2011, Vol. 7, Issue 2, pp. 5 – 14.

Maliyamkono, T. L. & Ogbuo, N. (1999). *Cost Sharing in Education and Health*. Dares Salaam. TEAM.

Mary, Wachuka, Wambaria. (2003). A Study of Constraints in the Use of Radio Programmes in Primary Schools in Kenya; A Case Study of Thika Municipality. Unpublished M, Comm. Thesis, University of Nairobi.

Mayo, J.K. (1990). Unmet Challenges: Educational broadcasting in the Third World.

McQuail, Denis. (2005). Mass Communication Theory (5th Ed.). SAGE Publications Ltd, London.

Michael, N. Bastedo. (2004). Essay: Open System Theory. The SAGE Encyclopedia of Educational Leadership and Administration; University of Michigan.

Ministry of Education & Vocational Training, Tanzania. (2007). Information and Communication Technology (ICT) Policy for Basic Education. Tanzania.

Mishra, S. (2005). Audio, Radio and Interactive Radio. In U. Reddi & S. Mishra (Eds.). *Perspectives on Distance Education: Educational media in Asia*. Source: http://www.col.org/colweb/site/pid/3329

Mishra, V., et al., (2007). The Socioeconomic Determinants of HIV Incidence: Evidence from A Longitudinal, Population-Based Study in Rural South Africa. AIDS 2007;21(Supp.1):S29-S38.Source: http://www.aidsonline.com/pt/re/aids/pdfhandler.00002030-200711007-

MOE. (2012). *Task Force on the Re-Alignment of the Education Sector To the Constitution of Kenya 2010.* Government Printers, Kenya.

MOEST. (2004). *Policy Framework on Education, Training and Research. Meeting the Challenges of Education, Training and Research in Kenya in the 21 Century*: Nairobi. Government Printers.

Mojgan, Afshari, Kamariah, Abu, Bakar, Wong, Su, Luan, Bahaman, Abu, Samah, & Foo, Say. (2009). Factors Affecting Teachers' Use of Information and Communication Technology. *International Journal of Instruction, Vol. 2, No.1*. Universiti Putra Malaysia, Malaysia.

Moulton, J. (1994).Interactive Radio Instruction*: Broadening the Definition*. Education Development Center. Source:

http://eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/15/b7/d8.pdf.

Mowitt, John. (2011). Radio: Essays in bad reception. University of California Press: Berkeley, CA, USA.

Mugenda, O. & Mugenda, A. (2003). Research Methods: Quantitative and Qualitative Approaches. Nairobi; Laba Graphics Services.

Muhammad, Amjad, Ali. (2015). Radio for Equitable Education to All. Source: *VFAST Transactions on Education and Social Sciences http://www.vfast.org/index.php/VTESS @ 2013 ISSN: 2309-3951 Volume7, Number1, May- June, 2015 pp.01-04.*

National AIDS and STI Control Programme. (2009). Kenya AIDS Indicator Survey 2007: Final Report, Nairobi, Kenya. Nairobi: Ministry of Health, Kenya. Available at http://nascop.or.ke/library/3d/Preliminary%20Report%20for%20Kenya%20AIDS%20indicator%20survey%202012.pdf.

Neal, O. (2003). *Offer a Degree for A Fee: Leveraging Technology to Accommodate Disabilities*. Available: http://edis.indiana.edu/

Nelson, Jagero. (2013). Poverty Level and Kenya Certificate of Primary Education (KCPE) Performance in Kenya. British Journal of Humanities and Social Sciences 18 April 2013, Vol. 9 (1).

Ngonga, B. (2002). An Assessment of English Language Teacher Education in the Light of Classroom Needs. A Case Study of Maseno University: Unpublished PhD Thesis. Maseno University.

Nigerian Educational Research & Development Council (NERDC). (2009). Source: Website, http://www.nerdcnigeria.org/

Norlin, J. M. (2009). *Human Behavior and the Social Environment: Social Systems Theory*. Upper Saddle River, NJ: Allyn & Bacon.

Nyagwachi, J. (2008). Public Private Partnerships: A Research Methodology. Unpublished Thesis, PhD (Construction Management). Port Elizabeth: Nelson.

Odera, F. (2005). Using World Space Radio to Improve Quality of Primary Education in Kenya at Distance (unpublished research thesis). Kenya.

Palmgreen, P. & Rayburn, J.D. (1981). "Gratifications and Exposure to Public Television: A Discrepancy Approach". Communication Research, 6:155-179

Palmgreen, P. (1984). Uses and Gratifications: A Theoretical Perspective. In R. Bostrom (Ed.), *Communication Yearbook 8* (pp. 20–55). Beverly Hills, CA: Sage.

Palmgreen, P., & Rayburn, J. D., II. (1979). Uses and gratifications and exposure to public television. *Communication Research, 6,* 155–180.

Palmgreen, P., & Rayburn, J. D., II. (1982). Gratifications sought and media exposure: An expectancy value model. *Communication Research, 9,* 561–580.

Palmgreen, P., & Rayburn, J. D., II. (1985). A Comparison of Gratification Models of Media Satisfaction. *Communication Monographs, 52,* 334–346.

Palmgreen, P., Wenner, L., & Rayburn, J.D. (1981). "Gratification Discrepancies and News Programme Choice" *Communication Research,* 8: 451-156

Pandey, Priyanka., Sangeeta, Goyal., & Venkatesh, Sundararaman. (2009). Community Participation in Public Schools: Impact of Information Campaigns in Three Indian States. *Education Economics* 13(3): 355-375

Philip, J. Grise, Jr., Kenneth, I. Epstein, & Teri, G. Lukin. (1974). Educational Radio: A Review of Literature. Centre for Educational Technology: The Florida state University, Tallahasee, Florida.

Poilt, D. & Hungler, B. (1985). Essentials of Nursing Research; Methods and Applications, J. B. Lippincott Company.

Potter, S. (2006). Doing Postgraduate Research (2nd ed.). London: Sage Publication.

R, West., & L. H. Turner. (2004). *Introducing Communication Theory: Analysis and Application* (2nd ed.). NY: McGraw-Hill, NY.

Raimo, W. Normi., & John, R. Darling. (2010). International Management Leadership: The Primary Competitive Advantage. Routledge, 270 Madison Ave. New York NY 10016.

Rashid, M. (2010). Distance Education: Concepts and Methods, Islamabad, Preston University Press.

Rashid, M. (2010). Educational Technology. Islamabad, Preston University Press.

Redecker,C.,Leis,M.,Leendertse,M.,Punie,Y.,Gijsbers,G.,Kirschner,P.,Stoyanov,S. & Hoogveld, B. (2011). The Future of Learning: Preparing for change, Retrieved fromhttp://ftp.jrc/EURdoc/JRC66836.pdf&http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=4719.

Reiser,R .A., & Gagnd, R .M. (1983). Selecting Media for Instruction. Englewood Cliffs, N J: Educational Technology.

Republic of Kenya. (2007 a). *Kenya Vision 2030*. Nairobi.

Republic of Kenya. (2007 b). Kenya Vision 2030 Course on Line. Retrieved 18/02/15 from www. vision 2030online.go.ke.

Republic of Kenya. (2009). ICT Capacities and Capabilities in Secondary Schools in Kenya. Nairobi: NCST No: 046.

Republic of Kenya. (2010). *The Constitution of Kenya*. Nairobi: Government Printer.

Republic of Kenya. (2012). Kenya Vision 2030: A Globally Competitive and Prosperous Kenya. Retrieved from: 20/02/12 from www. vision 2030.go.ke

Republic of Kenya. (2012). Task Force on the Re- alignment of the Education Sector to the Constitution of Kenya 2010.Towards A Globally Competitive Quality Education for Sustainable Development. Nairobi: MOEST.

Research in Open and Distributed Learning. Source: http://www.irrodl.org/index.php/irrodl/article/view/563/1038

Robert, A. Reiser. (2013). A History of Instructional Design and Technology: Part I: A History of Instructional Media. Source: Educational Technology Research and Development, Vol. 49, No. 1 (2001), pp. 53-64

Rogers, E. M. (2005). *Diffusion of Innovations (5th Ed.)*. The Free Press, New York.

Rogers, E.M. (1995) Diffusion of innovations (4th Ed.). New York, Free Press.

Rubin, A.M., Haridakis, P.M., & Piele, L.J. (2010). Communication Research: Strategies and Sources (7th ed.). Wadsworth Cencage Learning.

Rumble, G. (1989). The Role of Distance Education in National and International Development. *Distance Education Journal, 10*(1), 83-107.

Saettler, P . (1990). The Evolution of American Educational Technology. Englewood, C O: Libraries Unlimited.

Saettler, P. (2004). *Evolution of American Educational Eechnology (*2nd Ed.*).* Information Age Publishing.

Saettler,P . (1968).A Historyo f Instructionalte Chnology. New York: McGraw-Hill.

Sally, D. Berman. (2008). The Return of Educational Radio?.*The International Review of Research in Open and Distance Learning Volume 9, Number 2. ISSN: 1492-3831*

Sanyal, B. C. (2001). 'New Functions of Higher Education and ICT to Achieve Education for All': Paper Prepared for the Expert Roundtable on University and Technology-for-Literacy and Education Partnership in Developing Countries. *International Institute for Educational Planning*, UNESCO, September 10 to 12, Paris.

Sarason, S. (2003). *The Case for Change: Rethinking the Preparation of Educators*. Jossey-Bass, San Francisco.

Schramm, W. (1949). The Nature of News. *Journalism Quarterly, 26,* 259–269.

Schramm, W. (1962). “Learning from Instructional Television”, Review of Educational Research,

Schramm, W. (1977). Big Media, Little Media. Beverly Hills, CA: Sage.

Schramm, W., Lyle, J., & Parker, E. (1961). *Television in the Lives of Our Children.* Stanford, CA: Stanford University Press.

Scott, R. W. (2008). *Organizations and Organizing: Rational, Natural, and Open Systems Perspectives*. Upper Saddle River, NJ: Prentice Hall.

Scott, W.R. & Christensen, S. (1995). The Institutional Construction of Organizations: International and Longitudinal Studies. Thousand Oaks, CA, Sage Publications.

Scott, W.R. (2001). Institutions and Organizations, (2nd Ed.). Thousand Oaks, CA, Sage Publications.

Scott, W.R. (2002). *Organizations: Rational, Natural, and Open Systems.* Upper Saddle River, NJ: Prentice Hall.

Selinger, M. (2009). ICT in Education: Catalysts for Development, in Unwin, T. (Ed) *ICT4D: Information and Communication Technology for Development*. Cambridge: Cambridge University Press.

Selwyn, N. (2011). Education and Technology: Key Issues and Debates. Retrieved from http://site.ebrary.com/lib/ebop_intlenglish/docDetail.action?docID=10453142

Semere, Solomon., & Swadchet, Sankey. (2010). Interactive Radio Instruction: A Case Study in Nigeria. Sources: http://www.creativeassociatesinternational.com/wp-content/uploads/2014/05/Nigeria_COMPASS.pdf

Severin, W. J., & Tankard, J. W. (1997). *Communication Theories: Origins, Methods, and Uses in the Mass Media* (4th Ed.). New York: Longman.

Shannon, C.E., & Weaver, W. (1949). The Mathematical Theory of Communication. Urbana, IL: University of Illinois Press.

Sharma, R. (2003). 'Barriers in Using Technology for Education in Developing Countries', IEEE0-7803-7724-9103.Singapore schools. *Computers & Education* Vol .41, No.(1),Pp; 49--63.

Shaw, P. (2006). *The Four Vs of Leadership: Vision, Values, Value added, Vitality*. New York, NY: Wiley.

Siddiqqui, M.H. (2007). *Challenges of Educational Technology.* New Delhi: APH Publishing Corporation.

Singh, U. K., & Sudarshan, K. N. (2006). Broadcasting Education. Discovery Publishing House, New Delhi, India.

Standard Newspaper. (21 September, 2015). *Teachers' Pay Rise Demand Unsustainable*. The Standard Group Limited, Nairobi. Kenya.

Steadman Group. (2007). *Tanzania All Media Products Survey* (TAMPS) 2007. Tanzania

Steven, H. Chaffee. (1996). Thinking About Theory: An Integration Approach to Communication Theory and Research. Mahwah, NJ: Lawrence Erlbaum.

Strömberg, David. (2004). Radio‘s Impact on Public Spending. *The Quarterly Journal of Economics*. 117 (4): 1415-51.

Stuti, Khemani. (2005). Democracy, Public Expenditures, and the Poor: Understanding Political Incentives for Providing Public Services. *World Bank Research Observer*. 20 (1): 1–28.

Stuti, Khemani. (2011). Mass Media and Government Responsiveness: The Impact of Radio on the Government Distribution of Anti-Malaria Bed Nets in Benin. World Bank Policy Research Working Paper (November).

Surry, D. W., & Ely, D. P. (2002). Adoption, Diffusion, Implementation, and Institutionalization of Instructional Design and Technology. In R. A. Reiser & J. V. Dempsey (Eds.). *Trends and issues in instructional design and technology*. Upper Saddle River, NJ: Merrill Prentice Hall.

Syed, Noor – Ul-Amin. (No YR). *An Effective Use of ICT for Education and Learning by Drawing on Worldwide Knowledge Research Experience. ICT as A Change Agent for Education* (A Literature Review). Department of Education, University of Kashmir. Retrieved from: http:www.nyu.edu/classes/keefer/waoe/amins

Taylor, B.J. (1967). The Development of Instructional Television. In A.E. Koenig & R.B. Hill (Eds.), The Farther Vision: Educational Television Today. Madison, W I: University of Wisconsin Press.

The Curriculum Watch. (2007). The Educational Broadcasting in Kenya: Edwin, N. (Ed.). *Journal of KICD.*

Thomas, E. Ruggiero. (2000). Uses and The Gratification Theory in the 21st Century. Mass Communication and Society. Journal Mass Communication and Society, 3:1, 3-37, DOI: 10.1207/

Tyler, R.W. (1975). Have Educational Reforms Since 1950 Created Quality Education? Viewpoints, 51(2), 35-57. Vol. 32 No. 2, pp. 156-67.

UNAIDS. (2007). *Financial Resources Required to Achieve Universal Access to HIV Prevention, Treatment, Care and Support*. Geneva, UNAIDS. www.data.unaids.org/pub/Report/2007/20070925_advocacy_grne2_en.pdf

UNAIDS. (2008). Improving the Education Response to HIV and AIDS: Lessons of Partner Efforts in Coordination, Harmonization, Alignment, Information Sharing and Monitoring in Jamaica, Kenya, Thailand and Zambia. Paris: UNESCO. http://unesdoc.unesco.org/images/0015/001586/158683E.pdf.

UNAIDS. (2008). Report on the Global AIDS Epidemic. Geneva: UNAIDS. www.unaids.org/en/KnowledgeCentre/HIVData/GlobalReport/2008/2008_Global_report.asp

UNDP., & UNESCO. (2004). *Community Radio in India*. Source: http://www.undp.org.in/index.php?option=com_content&task=view&id=164&Itemid=99999999

UNESCO. (1965). Kenya Development of Broadcasting and Television. UNESCO, Paris

UNESCO. (1980). Many Voices, One World. Towards a New, More Just and More Efficient World Information and Communication Order. Paris: UNESCO.

UNESCO. (2000). *The Dakar Framework for Action*. Retrieved from unesdoc.unesco.org/images/0012/001211/121147 e.pdf.

UNESCO. (2002). Information and Communication Technology in Education. *A Curriculum for Schools and Programme for Teacher Development*. Paris: UNESCO.

UNESCO. (2002). Open And Distance Learning Trends, Policy And Strategy Considerations,14. UNESCO.

UNESCO. (2004). *Guidebook 1-ICTs in Education and School Nets. Asia and Pacific Regional Bureau for Education* .Retrieved from http://www.unescobkk.org/fileadmin/user upload/ict/e-books/school NetKit/guidebook1.pdf

UNESCO. (2005). *Challenges of Implementing the FPE in Kenya. Experience from the Districts.* Nairobi: UNESCO

UNESCO. (2005). Towards Knowledge Societies [Online]. Retrieved from http://unesdoc.unesco.org/images/0014/001418/141843e.pdf. UNESCO (2012). ICT in Education in Latin America and the Caribbean: A Regional Analysis of ICT Integration and E-Readiness. Retrieved from ict-regional-survey-lac-2012-en (1).pdf.

UNESCO. (2008). Education for All by 2015. Will We Make It? Global Monitoring Report. Retrived 10/07/11 from http:// www.unesco.org.

UNESCO/Nairobi. (2008). Case Study Review of HIV and AIDS Partner Efforts in Coordination, Harmonisation, Alignment, Information Sharing and Monitoring in Uganda. Nairobi: UNESCO (unpublished).

UNICEF (United Nations Children's Fund). 2000. "Defining Quality in Education." Working Paper. UNICEF/PD/ED/00/02. Programme Division, Education, UNICEF, New York.

United Nations Children's Fund. (2000). Defining Quality Education. New York: UNICEF.

Uwezo. (2010). Kenya National Learning Assessment Report 2010. Nairobi Kenya: Uwezo.

White Paper. (July, 2009). Information and Communication Technologies (ICT) in Education for Development', Global Alliance for ICT and Development.

White, R. A. (1994). Audience Interpretation of Media: Emerging Perspectives. *Communication Research Trends, 14*(3), 3–36.

Wimmer, R. D., & Dominick, J. R. (1994). *Mass Media Research: An Introduction.* Belmont, CA: Wadsworth.

Windahl, S. (1981). Uses and Gratifications at the Cross Roads. *Mass Communication Review Yearbook, 2,* 174–185.

Windahl, S., Hojerback, I., & Hedinsson, E. (1980). "Adolescents Without Television: A Study in Media Deprivation". *Journal of Broadcasting and Electronic Media,* 30: 47 - 63.pl

Winn, W. (1989). Toward A Rational and Theoretical Basis for Educational Technology. *Educational Technology Research & Development*, 37(1), 35-46.

World Bank. (2004). *School* Fees: *A Roadblock to EFA. Education Notes*: Washington DC: World Bank.

World Bank. (2005). Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education. World Bank.

World Bank. (2007). *World Development Report, 2007. Development and the Next Generation.* Washington DC: World Bank

World Bank. (2009). Constraints to Growth and Potential for Diversification and Innovation: Country Economic Memorandum, Benin. Africa Region, The World Bank, Washington, DC.

Y. K. Singh. & R. B. Bajpai. (2009). Research Methodology Data Presentation. APH Publishing, India.

Yin, R. K. (2003). Case Study Research, Design and Methods (3rd Ed.). London: Newbury.

Yusuf, M.O. (2005). Information and Communication Education: Analyzing the Nigerian National Policy for Information Technology. *International Education Journal* Vol. 6 No. (3), Pp; 316-321.

Zhao, Y & Cziko, G. A. (2001). Teacher Adoption of Technology: A Perceptual Control Theory Perspective. *Journal of Technology and Teacher Education, 9*(1),5-30.

Zhu, Chang. (2010). Teacher Roles and Adoption of Educational Technology in the Chinese Context. *Journal for Educational Research online, 2* (2), 72–86.

Zuppo, C.,M. (2012). *Defining ICT in A Boundaryless World: The Development Of A Working Hierarchy*. Marion Technical College (MTC).

APPENDICES

Appendix A: Budget and Time Frame

Description	Requirements	TIME FRAME	Amount (Kshs.)
Research proposal and approval	Stationary Photocopy papers Ball pens Foolscaps Calling air credit Internet	January, 2015 To May, 2015	25,500
Data collection	Transport Research assistant Questionnaire papers	June, 2015 To July, 2015	35,000
Report writing and submission	Typesetting fee and printing and binding Proof reading	August, 2015 To September, 2015	40,500
TOTAL			**101,000**
10% Contingencies			**10,100**
GRAND TOTAL			**111,100**

Appendix B: Introduction Letter

Erick Omulo M. Ribba

University of Nairobi,

P. O. Box 30197-00100

NAIROBI, Kenya

Dear Respondent,

RE: Research Information Collection.

My name is Erick Omulo M. Ribba and I am a student at the University of Nairobi pursuing a Master of Arts degree in Communication Studies (M.A). I am undertaking a research study on **Technological Challenges Faced by Radio Broadcasts to Schools Programme in Rangwe Division, Homa Bay County**.

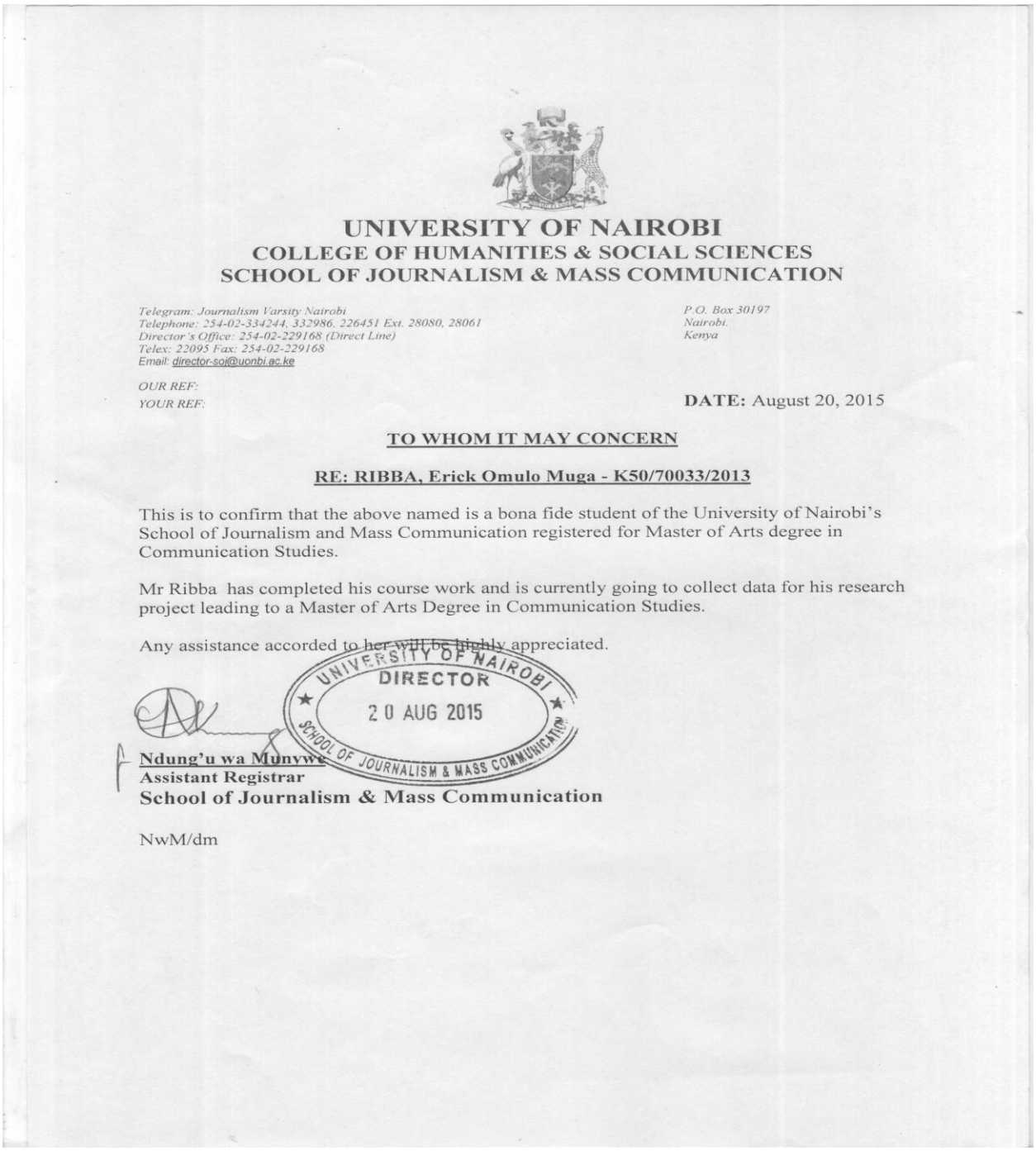
You have been selected to be one of the respondents in this study. Kindly assist me in collecting data by filling out the accompanying questionnaire where appropriate. The information provided on the questionnaire would be treated with uttermost confidentiality and will be used for academic purposes only. Your co-operation will be highly appreciated.

Thanking you in advance.

Yours Faithfully,

Erick Omulo Muga Ribba.

Appendix C: Letter from the University



UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES & SOCIAL SCIENCES
SCHOOL OF JOURNALISM & MASS COMMUNICATION

Telegram: Journalism Varsity Nairobi
Telephone: 254-02-334244, 332986, 226451 Ext. 28080, 28061
Director's Office: 254-02-229168 (Direct Line)
Telex: 22095 Fax: 254-02-229168
Email: director-soj@uonbi.ac.ke

P.O. Box 30197
Nairobi.
Kenya

OUR REF:
YOUR REF:

DATE: August 20, 2015

TO WHOM IT MAY CONCERN

RE: RIBBA, Erick Omulo Muga - K50/70033/2013

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 Ribba 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.

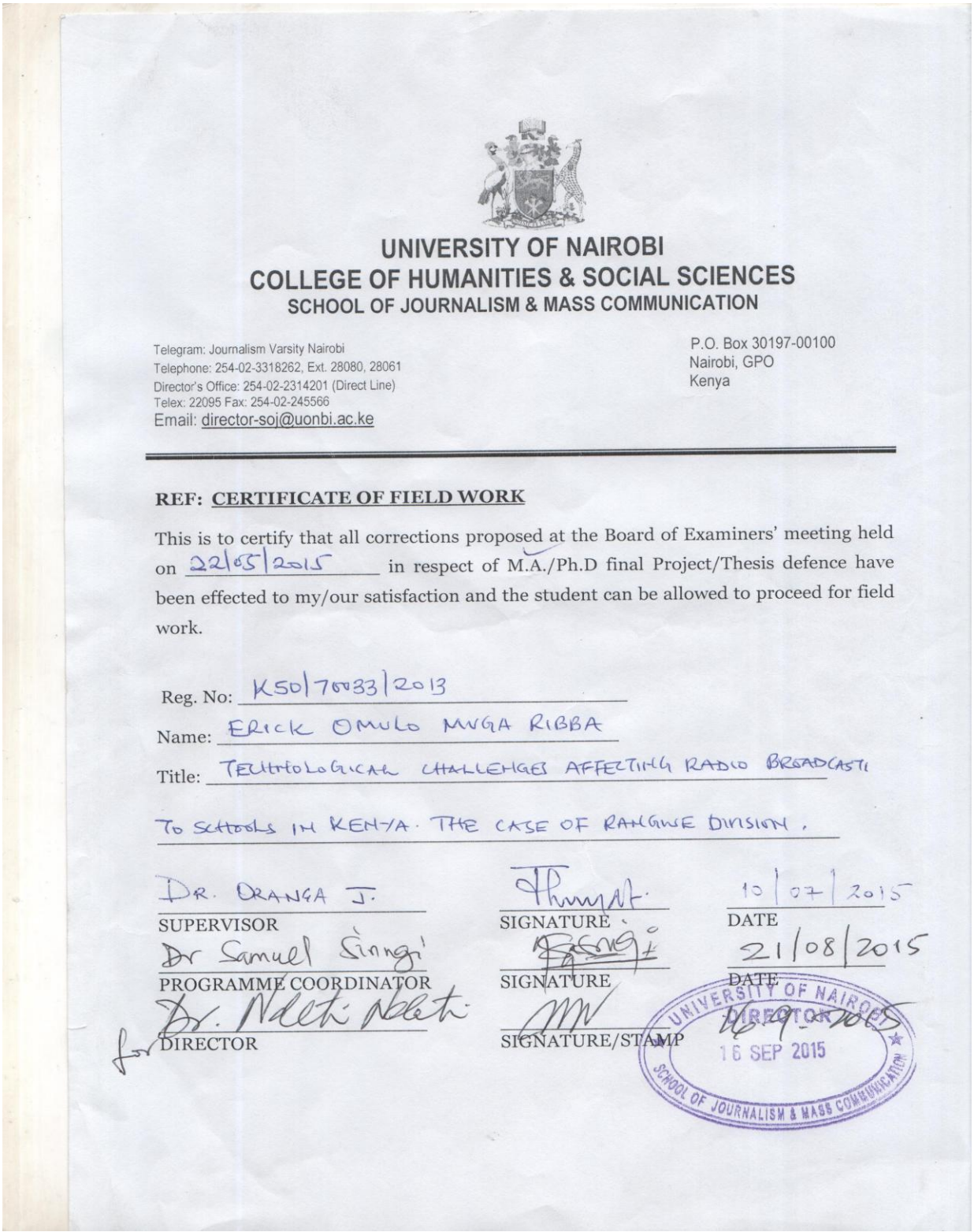
Any assistance accorded to her will be highly appreciated.

UNIVERSITY OF NAIROBI
DIRECTOR
20 AUG 2015
SCHOOL OF JOURNALISM & MASS COMMUNICATION

Ndung'u wa Munywe
Assistant Registrar
School of Journalism & Mass Communication

NwM/dm

Appendix D: Certificate of Field Work



UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES & SOCIAL SCIENCES
SCHOOL OF JOURNALISM & MASS COMMUNICATION

Telegram: Journalism Varsity Nairobi
Telephone: 254-02-3318262, Ext. 28080, 28061
Director's Office: 254-02-2314201 (Direct Line)
Telex: 22095 Fax: 254-02-245566
Email: director-soj@uonbi.ac.ke

P.O. Box 30197-00100
Nairobi, GPO
Kenya

REF: CERTIFICATE OF FIELD WORK

This is to certify that all corrections proposed at the Board of Examiners' meeting held on 22/05/2015 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: K50/70033/2013

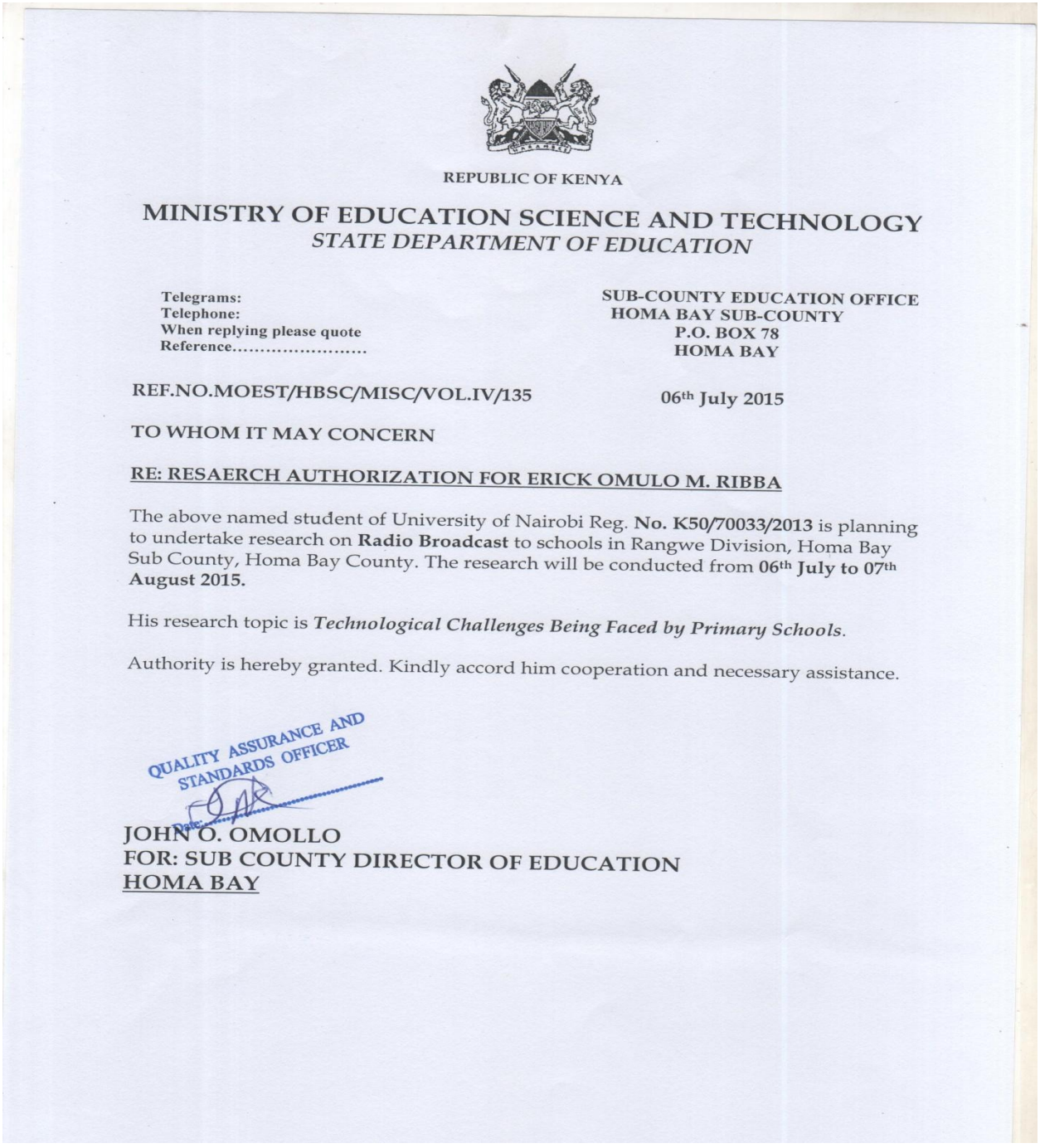
Name: ERICK OMULO MUGA RIBBA

Title: TECHNOLOGICAL CHALLENGES AFFECTING RADIO BROADCASTS TO SCHOOLS IN KENYA. THE CASE OF RANGWE DIVISION.

DR. ORANGA J.		10/07/2015
SUPERVISOR	SIGNATURE	DATE
Dr Samuel Singi		21/08/2015
PROGRAMME COORDINATOR	SIGNATURE	DATE
for Dr. Ndeti Ndati		
DIRECTOR	SIGNATURE/STAMP	DATE

UNIVERSITY OF NAIROBI
16 SEP 2015
SCHOOL OF JOURNALISM & MASS COMMUNICATION

Appendix E: Letter from the District Education Officer (DEO) in Homa Bay



REPUBLIC OF KENYA

MINISTRY OF EDUCATION SCIENCE AND TECHNOLOGY
STATE DEPARTMENT OF EDUCATION

Telegrams:
Telephone:
When replying please quote
Reference.....

SUB-COUNTY EDUCATION OFFICE
HOMA BAY SUB-COUNTY
P.O. BOX 78
HOMA BAY

REF.NO.MOEST/HBSC/MISC/VOL.IV/135

06th July 2015

TO WHOM IT MAY CONCERN

RE: RESAERCH AUTHORIZATION FOR ERICK OMULO M. RIBBA

The above named student of University of Nairobi Reg. **No. K50/70033/2013** is planning to undertake research on **Radio Broadcast** to schools in Rangwe Division, Homa Bay Sub County, Homa Bay County. The research will be conducted from **06th July to 07th August 2015.**

His research topic is ***Technological Challenges Being Faced by Primary Schools.***

Authority is hereby granted. Kindly accord him cooperation and necessary assistance.

QUALITY ASSURANCE AND STANDARDS OFFICER

JOHN O. OMOLLO
FOR: SUB COUNTY DIRECTOR OF EDUCATION
HOMA BAY

Appendix F: Learners Questionnaire

Please answer the following questions by placing a tick [√] where appropriate in the spaces provided.

Respondent's No. .....

Name of the School.....

Name of the Division: .....

Name of the Zone: .....

Class.....

Are you aware of the airing of radio broadcast to schools programme through KBC English Service radio?

Yes ☐ No ☐

If No, why?

.....
.....
.....
.....
.....

Is there any electricity power connection in your school?

Yes ☐ No ☐

Is there any functional radio set(s) in the school?

Yes ☐ No ☐

Do you listen to radio lessons being aired through KBC English service channel in the school?

Yes ☐ No ☐

If No, why?

.....
.....
.....
.....
.....

How many times in a week do you listen to the radio lessons in class?

Remarks (Tick appropriately)

Listening to radio lessons in class	None at all	Once a week	Twice a week	Thrice a week	Four times a week	Five times a week

What do you think should be done to increase the rate of listening to radio broadcast to schools' programmes?

.....

.....

.....

.....

.....

How clear is the radio signal in your school?

Remarks (Tick appropriately)

Radio signal clear	Not clear	Fairly clear	Clear	Very clear

Any comment from your answer above?

……

……

……

……

How do you rate the radio programmes?

Remarks (Tick appropriately)

Radio programmes	Poor	Fair	Good	Very Good

Are the radio lessons helpful in your studies?

Yes ☐ No ☐

If Yes, how do the radio lessons help in your studies?

.....

.....

.....

.....

.....

.....

Any other comment

.....

.....

.....

.....

.....

Appendix G : Teachers Questionnaire

Please answer the following questions by placing a tick [√] where appropriate in the spaces provided.

Respondent's No. .....

Name of the School.....

Name of the Division: .....

Name of the Zone: .....

Class(es) you are teaching.....

Are you aware of radio broadcast to schools programme being aired through KBC English Service radio channel?

Yes ☐ No ☐

If No, why?

.....

.....

.....

.....

Is your school connected to electricity power?

Yes ☐ No ☐

Is there functional radio set(s) in the school?

Yes ☐ No ☐

If No, why?

.....

.....

.....

.....

Do you use radio set(s) to teach in the class rooms?

Yes ☐ No ☐

If No, what do you use radio for?

.....

.....

.....

.....

.....

Do you easily access radio broadcast to schools' programme transmitted through KBC English service channel?

Yes ☐ No ☐

What should be done to increase the accessibility of radio broadcast to schools in the area?

.....
.....
.....
.....
.....
.....

Which frequency mode(s) below do you receive the broadcast signal of radio lessons through KBC English service channel?

No.	*Frequency Mode*	*Remarks (Tick appropriately)*
1	Frequency Modulation (FM)	
2	Medium Wave (MW)	
3	Short Wave (SW)	
4	Digital platform	

How is the signal strength of the radio reception in the school?

No.	*Radio Signal Strength*	*Remarks (Tick appropriately)*
1	Very Good	
2	Good	
3	Fair	
4	Poor	

Give your comment to the above response?

.....

.....

.....

.....

Do you find radio set(s) easy to operate and use as an instructional tool in class?

Yes ☐ No ☐

Give your comment to the answer above?

……

……

……

……

Are the radio lessons being aired through KBC English service of any value to learning?

Yes ☐ No ☐

Give reason(s) to your answer above?

.....

.....

.....

.....

What should be done to increase the use of radio lessons in class?

……

……

……

……

……

What are the levels of support accorded to radio broadcast to schools programme in the categories below?

Remarks (Tick appropriately)

	Poor	Fair	Good	Very Good
Headteacher(s)				
Teacher(s)				
Pupils				
County Education Officer (CEO)				
Kenya Institute of Curriculum				

Development (KICD)				
Any other (Name)				

Any other comment?

.....
.....
.....
.....
.....
.....

Appendix H: Headteachers Questionnaire

Please answer the following questions by placing a tick [√] where appropriate in the spaces provided.

Respondent No. .....

Name of the School.....

Name of the Division: .....

Name of the Zone: .....

Are you aware of radio broadcast to schools programme aired through KBC English Service radio channel?

Yes ☐ No ☐

If No, why?

.....

.....

.....

.....

Is your school connected to electricity power?

Yes ☐ No ☐

Is there functional radio set(s) in the school?

Yes ☐ No ☐

If No, why?

.....

.....

.....

.....

Do teachers use radio set(s) to teach in class rooms?

Yes ☐ No ☐

If No, what do you use radio for?

.....

.....

.....

.....

.....

Do you easily access radio broadcast to schools' programme transmitted through KBC English service channel?

Yes ☐ No ☐

What should be done to increase the accessibility of radio broadcast to schools in the area?

.....

.....

.....

.....

.....

.....

Which frequency mode(s) below do you receive the broadcast signal of radio lessons through KBC English service channel?

No.	*Frequency Mode*	*Remarks (Tick appropriately)*
1	Frequency Modulation (FM)	
2	Medium Wave (MW)	
3	Short Wave (SW)	
4	Digital	

	platform	

How is the signal strength of the radio reception in the school?

No.	*Radio Signal Strength*	*Remarks (Tick appropriately)*
1	Very Good	
2	Good	
3	Fair	
4	Poor	

Give your comment to your answer above?

.....

.....

.....

.....

Are teachers finding radio set(s) easy to operate and use as an instructional tool in a class?

Yes ☐ No ☐

Give your comment to the answer above?

……

……

……

……

Are there challenges being experienced by teachers when using the radio broadcast to schools programme?

Yes ☐ No ☐

If Yes, what are the challenges?

……
……
……
……
……
……
……..

How do you address these challenges?

.....
.....
.....
.....
.....
.....
.....

Are the radio lessons being aired through KBC English service of any value to learning?

Yes ☐ No ☐

Give reason(s) to your answer above?

.....
.....
.....
.....

What should be done to increase the use of radio lessons in class?

……
……
……
……
……

What are the levels of support accorded to radio broadcast to schools in the categories below?

Remarks (Tick appropriately)

	Poor	Fair	Good	Very Good
Headteacher(s)				
Teacher(s)				
Pupils				
County Education Officer (CEO)				
KICD				

Any other (Name)				

Any other comment

.....

.....

.....

Appendix I: KBC Radio Engineer Questionnaire

Please answer the following questions by placing a tick [√] where appropriate in the spaces provided.

Respondent's No. .....

Name of the organization: .....

Position/ Job Designation: .....

Are you aware of radio broadcast to schools programs through KBC English Service radio channel?

Yes ☐ No ☐

If No, why?

.....

.....

.....

.....

.....

Which frequency mode(s) are the listeners able to receive the transmitted KBC English Service radio signal?

No.	Frequency Mode	Remarks (Tick appropriately)
1	Frequency Modulation (FM)	
2	Medium Wave (MW)	
3	Short Wave (SW)	
4	Digital platform	
5	Any other? …… …….	

Give reasons to your answer(s) above?

.....

.....

.....

.....

.....

.....

.....

How is the English Service radio frequency signal distribution strength in Rangwe Division, Homa Bay County?

No.	Radio Signal Strength	Remarks(Tick appropriately)
1	Very Good	
2	Good	
3	Fair	
4	Poor	

Have you ever been informed of any poor radio signal receivership by KICD concerning radio broadcast to schools programmes?

Yes ☐ No ☐

What mechanisms have you put in place in addressing such challenges, if any?

.....

.....

.....

.....

.....

.....

How is the topography of a place affecting the radio signal strength?

.....

.....

.....

.....

.....

.....

What is KBC doing in addressing such challenges?

.....

.....

.....

.....

.....

.....

Have you ever done any effort to evaluate accessibility of KBC English service channel to your audience in Rangwe division, Homa Bay County?

Yes ☐ No ☐

Give reasons to your answer above?

.....

.....

.....

.....

.....

What should be done on by KBC to make radio broadcast to schools programme a success?

.....

.....

.....

.....

.....

Any other comment(s)?

……

……

……

……

……

……

……

Appendix J: Divisional Education Officers Questionnaire

Please answer the following questions by placing a tick [√] where appropriate in the spaces provided.

Respondent No. .....

Name of the Division: .....

Name of the Zone: .....

What is your take on radio broadcast to schools programme through KBC English Service radio?

.....
.....
.....
.....
.....

Is there any awareness created by your office concerning the radio broadcast to schools programme?

.....
.....
.....
.....

.....
.....

How is the connectivity of electricity power to schools in Rangwe division? (Quantify if possible)

……
……
……
……
…….
……
…..

In general, how is the radio signal distribution strength in Rangwe Division, Homa Bay County?

No.	Radio Signal Strength	Remarks (Tick appropriately)
1	Very Good	
2	Good	
3	Fair	
4	Poor	

What are other technological challenges experienced by schools concerning the radio broadcast to schools programme, if any?

.....
.....
.....
.....
.....
.....

Have you ever evaluated accessibility and use of radio broadcast to schools programme in primary schools within Rangwe division?

Yes ☐ No ☐

Give your comments on the answer above?

.....
.....
.....
.....
.....

Is your office facilitating radio broadcast to schools programme in primary schools within the area?

Yes ☐ No ☐

If Yes, How is your office facilitating the programme?

.....
.....
.....
.....
.....
.....

How is the government supporting radio broadcast to schools programme?

……

……

……

……

……

Any other comment(s)?

……

……

……

……

……

……

Appendix K: KICD Questionnaire

Please answer the following questions by placing a tick [√] where appropriate in the spaces provided.

Respondent No. .....

Name of the organization: .....

Position/ Job Description: .....

How is the level of awareness of radio broadcast to schools programme in Rangwe division, Homa Bay County?

……

……

……

……..

In cases where the levels of awareness of IRLs are low, what is KICD doing to increase its awareness?

……
……
……
……..

Which frequency modes are the radio broadcasts to schools programmes transmitted by KBC English channel being received by the listeners?

No.	Frequency Mode	Remarks (Tick appropriately)
1	Frequency Modulation (FM)	
2	Medium Wave (MW)	
3	Short Wave (SW)	
4	Digital platform ……	

How does KICD make sure that the listeners are made aware of the frequency modes of transmissions?

……
……
……
……...
.....

How is the signal strength of KBC English Service radio frequency distribution in Rangwe Division, Homa Bay County?

No.	Radio Signal Strength	Remarks (Tick appropriately)
1	Very Good	
2	Good	
3	Fair	
4	Poor	

How do you coordinate with KBC, the service provider to know the radio signal distribution strengths during broadcast to schools' programmes?

.....

.....

.....

.....

.....

In areas where the radio signal strength is weak, how do you go about them?

.....

.....

.....

.....

.....

Do schools receive broadcast time tables promptly?

Yes ☐ No ☐

Give reasons to you response above?

.....

.....

.....

.....

.....

How does KICD distribute radio broadcast time tables to schools?

.....

.....

.....

.....

.....

What are other technological challenges faced by radio broadcast to schools programme in Kenya?

.....

.....

.....

.....

.....

.....

What are the mechanisms put in place in addressing such challenges?

.....

.....

.....

.....

.....

.....

Have you made any effort to evaluate the accessibility of radio broadcasts to schools within Homa Bay County?

Yes ☐ No ☐

Give reasons to you response above?

.....

.....

.....

.....

.....

What should be done by KICD to make radio broadcast to schools programmes a success in terms of its accessibility in Homa Bay County and other parts of the country?

.....
.....
.....
.....
.....

Any other comment?

……
……
……
……
……

Appendix L: Observation Schedule

Name of the School.....

Name of the Division: .....

Name of the Zone: .....

What are the levels of aware of the KICD radio broadcast to schools programs through KBC English Service?

NO.	Participants	V. High	High	Low	Very Low
1	County Education Officers knowledge on the programmes				
2	Headteacher's knowledge on the				

	programmes				
3	Teachers knowledge on the programmes				
4	Learners knowledge on the programmes				
5	KBC technical staff-radio				

If Low, why?

.....

.....

.....

.....

Number of functional radio(s) in the school?

No.	Number of radios	Remarks (Tick appropriately)
1	Nil	
2	1-2	
3	3-4	
4	4-6	

5	7 and above	

How is the signal strength of radio programme frequency distribution in Rangwe Division, Homa Bay County?

No.	Radio Signal Strength	Remarks (Tick appropriately)
1	Very Good	
2	Good	
3	Fair	
4	Poor	

What are radio(s) used for in the school?

.....

.....

.....

.....

Is the school receiving broadcast time tables yearly in time?

.....

.....

.....

.....

How are the broadcast time tables used in the school?

.....

.....

.....

.....
.....

Are these programs of any value to learning?

.....
.....
.....
.....

How is the connection of electricity power to the school?

.....
.....
.....
.....

What do teachers do to encourage other teachers to use radio lessons in classes?

.....
.....
.....
.....
.....

What should be done to increase accessibility of radio broadcast to schools?

No.	Technical Challenges	Remarks
1	Mode of transmission (AM,FM)	

2	Infrastructural development	
3	Topography	
4	Availability of educational hardware and software	
5	Technical know-how of the end users	

Appendix M: Broadcast Time Table

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

ISO 9001 : 2008 CERTIFIED

MEDIA AND EXTENSION SERVICES BROADCAST TO SCHOOLS TIMETABLE - 2015

KBC English Service

We are now broadcasting on the KBC English Service. Tune to KBC English Service on either Medium Wave (MW) or Frequency Modulation (FM).

TIME / DAY	8.25 To 8.30	8.30 To 8.50	8.50 To 9.00	9.00 To 9.20	9.20 To 9.50	9.50 To 10.10	10.10 To 10.20	10.20 To 10.40	10.40 To 11.00	11.00 To 11.35	11.35 To 11.55	11.55 To 12.05	12.05 To 12.25	12.25 To 12.30	12.30 To 12.50	12.50 To 2.00	2.00 To 2.20	2.20 To 2.30	2.30 To 2.50	2.50 To 3.00	3.00 To 3.20	3.20 To 3.30	3.30 To 3.50	3.50 To 4.10	4.10 To 4.30	4.30 To 4.50
MONDAY	PROGRAMME LINE UP	English Std 8	EDUCATIONAL NEWS AND ANNOUNCEMENTS	Maths Std 4	(BREAK) KENYA NATIONAL MUSIC FESTIVAL ITEMS	Maths Std 6	EDUCATIONAL NEWS AND ANNOUNCEMENTS	History & Govn Form 4	CRE Std 7	(BREAK) KENYA NATIONAL MUSIC FESTIVAL ITEMS	Social Studies Std 5	EDUCATIONAL NEWS AND ANNOUNCEMENTS	CRE Std 4	EDUCATIONAL NEWS AND ANNOUNCEMENTS	CRE Std 6	LUNCH/EDUCATIONAL NEWS AND ANNOUNCEMENTS	Post Box (Upper Primary)	EDUCATIONAL NEWS AND ANNOUNCEMENTS	Fasihi Form 3 & 4 (Kidagaa Kimemwozea)	KENYA NATIONAL MUSIC FESTIVAL ITEMS	Lit Form 3 & 4 (Caucasian Chalk Circle)	EDUCATIONAL NEWS AND ANNOUNCEMENTS	Oral Lit Form 3 & 4	Computer Studies Form 4	Guidance & Counselling for Secondary Schs	Curriculum Orientation	EDUCATIONAL NEWS AND ANNOUNCEMENTS
TUESDAY		Maths Std 7		Science Std 5		Kiswahili Std 6		Lit for Form 3 & 4(Whale Rider)	English Std 4		CRE Std 8		Social Studies Std 7		CRE Std 5		Drug & Substance Abuse (Upper Primary)		Fasihi Form 3 & 4 (Damu Nyeusi)		Lit Form 3 & 4 (When the Sun Goes Down and Other Stories)		Physics Form 4	Biology Form 3	English Catch the Phrase / Sound	Adult and Continuing Education	
WEDNESDAY		English Std 6		Science Std 4		Kiswahili Std 8		English Form 3	English Std 5		Science Std 6		Kiswahili Std 5		Life Skills/ Peace Education Std 7		Civic Education (Upper Primary)		Biology Form 4		Chemistry Form 3		Oral narratives Form 3 & 4	Lit Form 3 & 4 (The River and the Source)	Music of Poetry	Curriculum Orientation	
THURSDAY		English Std 7		Maths Std 5		Kiswahili Std 7		Kiswahili Form 3 (Lugha)	Life Skills Std 8		Kiswahili Std 4		Social Studies Std 6		Science Std 8		Life Skills Std 5		Geography Form 4		Lit Form 3 & 4 (Betrayal in the City)		Fasihi ya Kiswahili Form 3 & 4 (Mstahiki Meya)	Introduction to East African Poetry	Curriculum Orientation	ECD Teacher Education	
FRIDAY		Maths Std 8		IRE Std 6		IRE Std 7		Maths Form 3	IRE Std 8		Science Std 7		Social Studies Std 4		Social Studies Std 8		Life Skills Std 6		CRE Form 3		Physics Form 3		Business Studies Form 3	Business Studies Form 4	Career Information	Adult and Continuing Education	

KEY

Primary School Programmes

Secondary School Programmes

Post-Secondary School Programmes

RADIO BROADCAST RECEPTION FREQUENCIES & COVERAGE AREAS

COUNTY / FREQUENCY	Nairobi/Kiambu/ Muranga/Nyandarua Nyeri/Kirinyaga	Kajiado/Nakuru/ Kericho/Nandi/ Baringo/Nyahururu, Uasin Gishu/Trans Nzoia/Elgeyo Marakwet/West Pokot, Turkana, Laikipia	Isiolo/Meru/Embu/ Machakos/Kitui/ Makueni Marsabit/ Moyale / Tharaka Nithi	Mombasa/Kwale/ Kilifi/Malindi/Taita/ Taveta, Lamu/Tana River	Garissa, Wajir/ Mandera	Kakamega/ Bungoma/ Busia	Kisumu/Siaya/ Homabay/Kisii/ Migori / Nyamira
MEDIUM WAVE(MW) BAND (KHz)	747	747/954/1386/1134/900	900/747/1233	981/639	639/1305		954
VHF-FM BAND (MHz)	95.6/100.7	95.6/91.5/103.5/100.7	103.5/100.7/103.6	104.4		91.5	91.5

RADIO BROADCAST TERM DATES – 2015

1ST TERM – 12TH JANUARY – 20TH MARCH

2ND TERM – 11TH MAY – 17TH JULY

3RD TERM – 7TH SEPTEMBER – 13TH NOVEMBER

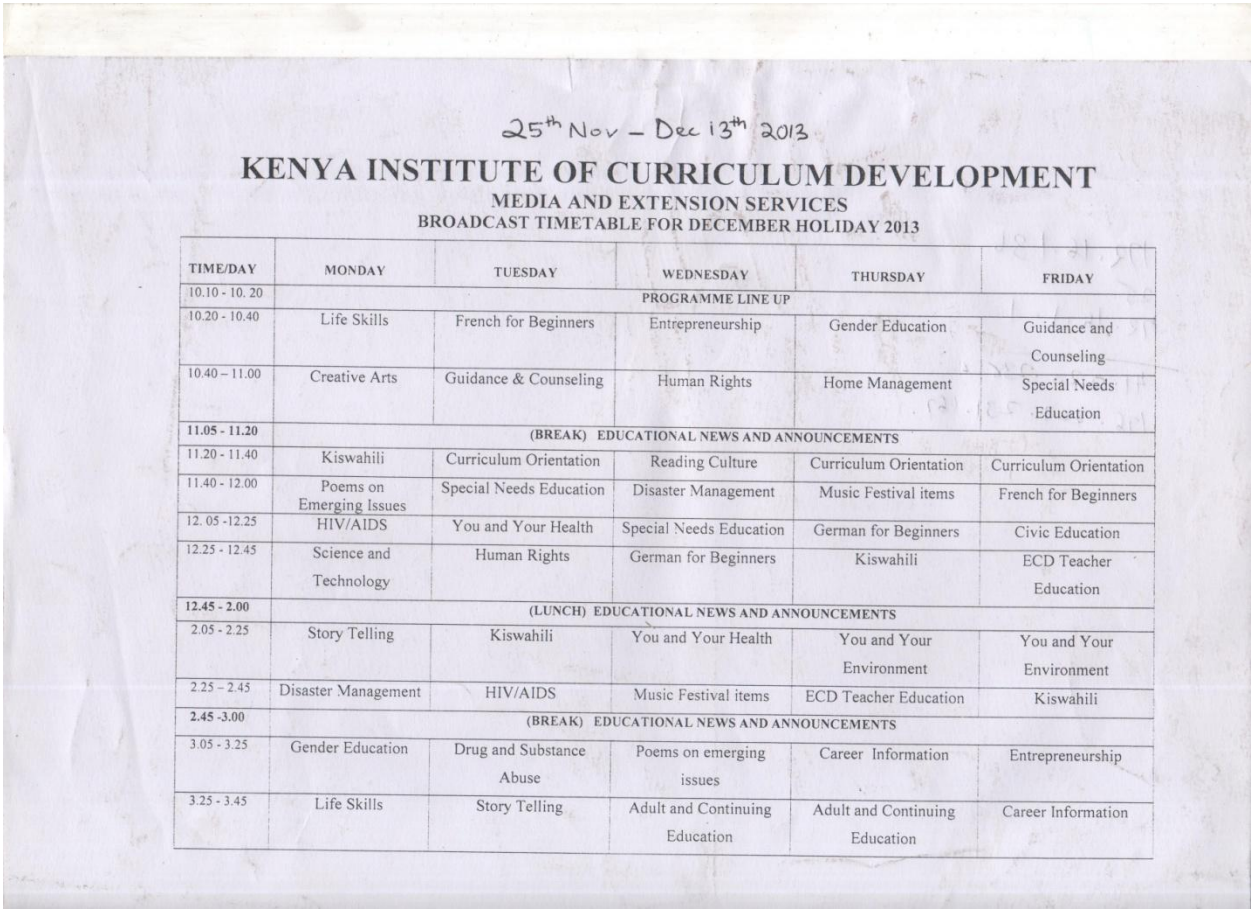
IMPORTANT TIPS

1. The timetable is for the WHOLE YEAR. Use and PRESERVE IT CAREFULLY to last you the entire year.
2. During the school holidays educational programmes for the general public will be broadcast.
3. All the radio programmes are available for sale in cassettes and CDs at the KICD Multi-media bookshop.
4. Video Cassettes and DVDs in various subjects and e-learning, National Science Congress, Drama and Music festivals are also available for sale.
5. Broadcast guides for the various subjects are available in the KICD bookshop & various outlets in your county

EDU CHANNEL The National Educator

All Enquiries to:THE DIRECTOR, KENYA INSTITUTE OF CURRICULUM DEVELOPMENT, Desai-Rwathia Rd, Off Murang'a Rd. P. O Box 30231 NAIROBI – 00100, Att: Head of the Radio Section Tel : (020) 3749900 – 9/(020) 2100814 - 7 / 0729 327334/ 0710702424, Fax (020) 3639130. Email: info@kicd.ac.ke, www.kicd.ac.ke

Appendix N: KICD Holidays Programmes



25th Nov – Dec 13th 2013

KENYA INSTITUTE OF CURRICULUM DEVELOPMENT

MEDIA AND EXTENSION SERVICES

BROADCAST TIMETABLE FOR DECEMBER HOLIDAY 2013

TIME/DAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
10.10 - 10. 20	PROGRAMME LINE UP				
10.20 - 10.40	Life Skills	French for Beginners	Entrepreneurship	Gender Education	Guidance and Counseling
10.40 – 11.00	Creative Arts	Guidance & Counseling	Human Rights	Home Management	Special Needs Education
11.05 - 11.20	(BREAK) EDUCATIONAL NEWS AND ANNOUNCEMENTS				
11.20 - 11.40	Kiswahili	Curriculum Orientation	Reading Culture	Curriculum Orientation	Curriculum Orientation
11.40 - 12.00	Poems on Emerging Issues	Special Needs Education	Disaster Management	Music Festival items	French for Beginners
12. 05 -12.25	HIV/AIDS	You and Your Health	Special Needs Education	German for Beginners	Civic Education
12.25 - 12.45	Science and Technology	Human Rights	German for Beginners	Kiswahili	ECD Teacher Education
12.45 - 2.00	(LUNCH) EDUCATIONAL NEWS AND ANNOUNCEMENTS				
2.05 - 2.25	Story Telling	Kiswahili	You and Your Health	You and Your Environment	You and Your Environment
2.25 – 2.45	Disaster Management	HIV/AIDS	Music Festival items	ECD Teacher Education	Kiswahili
2.45 -3.00	(BREAK) EDUCATIONAL NEWS AND ANNOUNCEMENTS				
3.05 - 3.25	Gender Education	Drug and Substance Abuse	Poems on emerging issues	Career Information	Entrepreneurship
3.25 - 3.45	Life Skills	Story Telling	Adult and Continuing Education	Adult and Continuing Education	Career Information