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Research Article

Factors Affecting Radio Broadcasts to Schools in Kenya: A Case Study of Public Primary Schools in Rangwe Division, Homa Bay County

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Abstract: Kenya Institute of Curriculum Development (KICD) develops Interactive Radio Lessons (IRLs) for learners in all levels of education apart from the university. The major aim of the broadcast is to widening accessibility to education. The purpose of the study was to establish how different transmission modes affect the accessibility of the radio broadcast to schools within 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 was analyzed both qualitatively and quantitatively using descriptive statistics with the help of Statistical Professional Social Sciences (SPSS) Version 20. The findings showed that absolute majority of schools were not accessing radio broadcasts to schools programme due to; lack of functional radio sets in schools, electricity, Poor radio signal receptions, and lack of sensitization in schools. It is recommend that 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 access toeducation for all learners.
Keywords: Interactive Radio Lessons, Accessibility, Technology, Radio Broadcast, Hardware, Software.

Introduction

Radio is one of the tools of Information Communication and Technological (ICT) 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). The radio lessons provide interactive, complete and ready to use sessions intended to inspire and motivate learners (Wambaria, 2003). 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 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).

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.

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.

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.

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). In Uganda, radio programmes for learning was established in 1964. The 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. This 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).

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), formally Kenya Institute of Education (KIE) (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.

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).

Statement of the Problem

Schools in several parts of Kenya, especially in rural areas are very much affected in terms of access to quality and equitable education (Odera, 2014; Bosch, 2004). The Kenyan government re-introduced radio broadcast to schools programme in 2003 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).

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 (Odera, 2014; KIE, 2008).

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 of Kenya (MOEST, 2005).

Objective of the study

The study was based on the following 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.

Research Questions

The study answered the following 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?

Limitations and delimitation 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 having 21 and 19 primary schools respectively, including the private schools. 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, KasipulKabondo, 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.

Literature Review

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). 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.

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).

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 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.

Infrastructural Development

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 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.

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).

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).

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).

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 Vihigacounty. 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 Vihigacounty 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.

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, 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.

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.

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 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).

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).

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.

Theoretical Frame Work

Theories are general statements that summarize our understanding of the way the world operates (Severin and Tankard, 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.

Research Methodology

Research Design

The study adopted descriptive survey design, using both qualitative and quantitative methods. Descriptiveresearch 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 and Mugenda, 2003).

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).

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.

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. 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.

Sample Size

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.

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 and Clark, 2007).

Findings and Discussion

The findings were done objectively while answering the questions of the study.

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.

Research Question 1

The respondents were asked which frequency mode(s) were they able to receive the broadcasts signals of radio lessons transmitted through KBC English service channel. The results were as shown in the Figure 1 below.

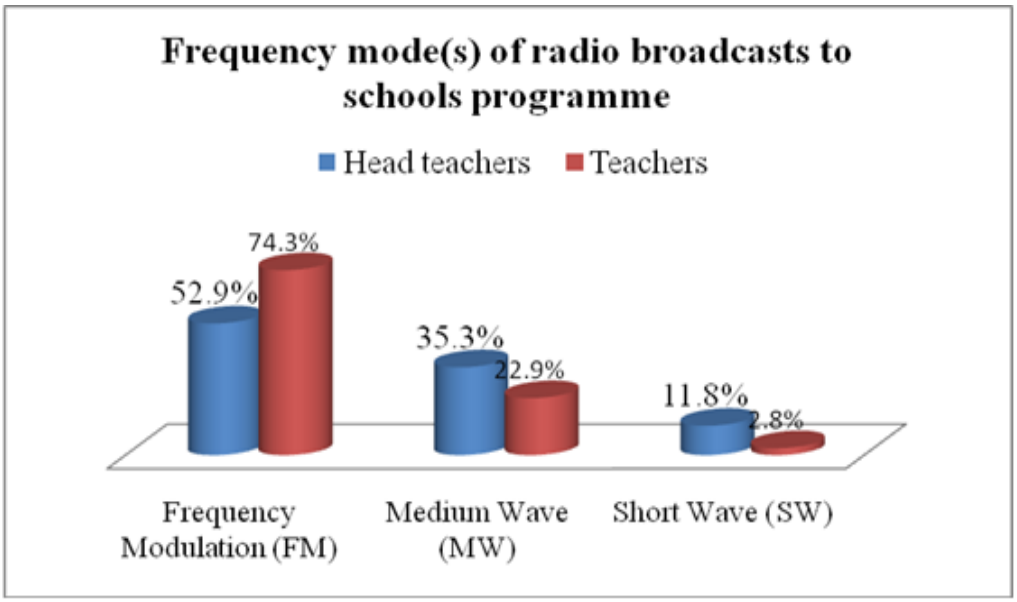

Figure 1. Frequency Mode(s) of KBC Radio Broadcast to Schools
(Source: Field Survey 2015)

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.

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.

Research Question 2

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 2 below.

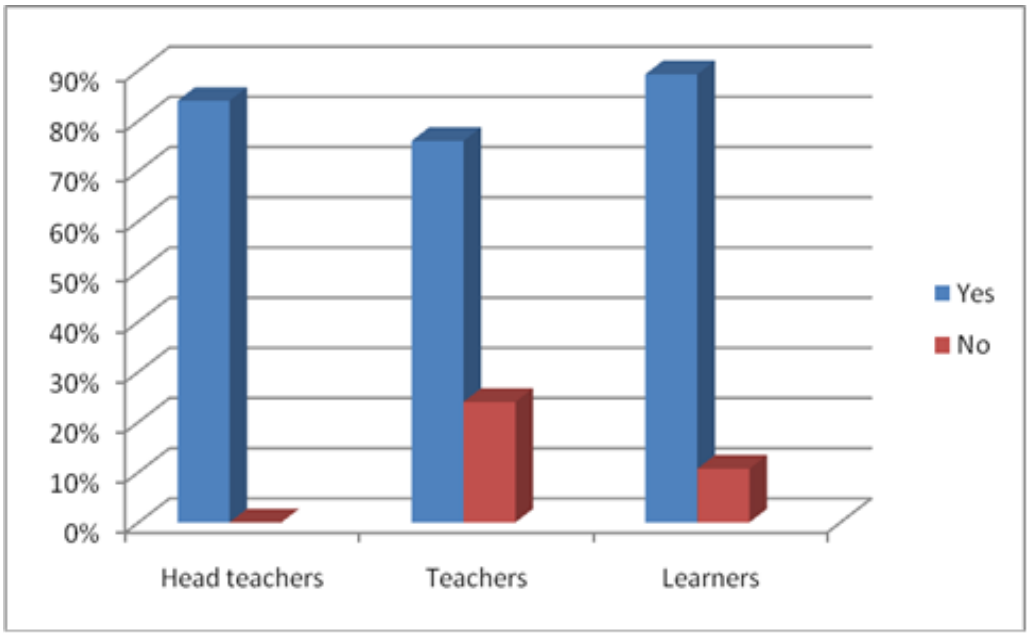

Figure 2. Electricity power connections in schools (Source: Field Survey 2015)

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.

Question 3

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 3 below.

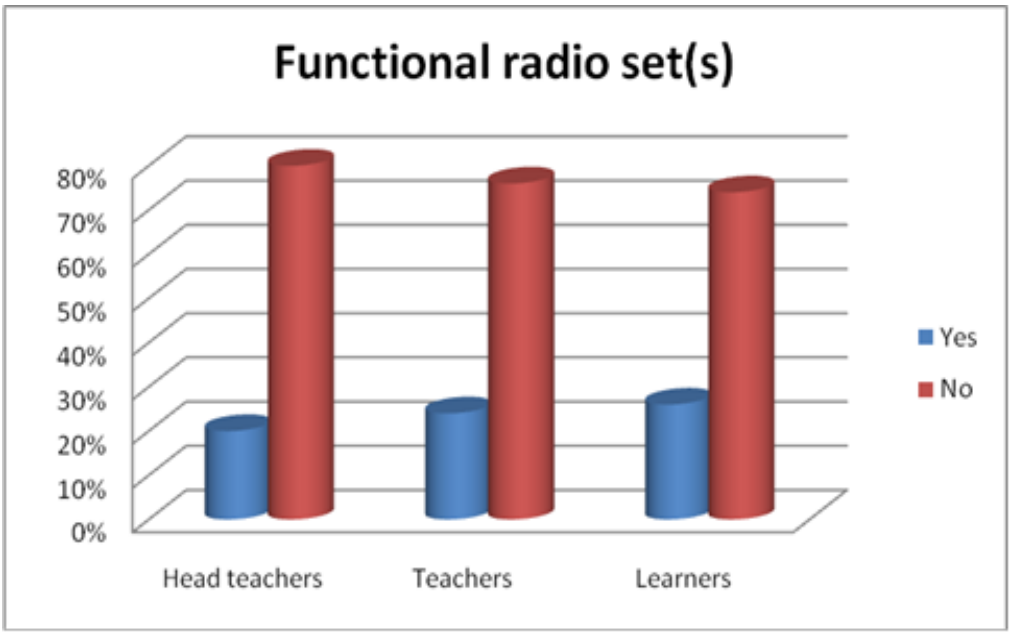

Figure 3. Functional radio set(s) in the school (Source: Field Survey 2015)

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 below.

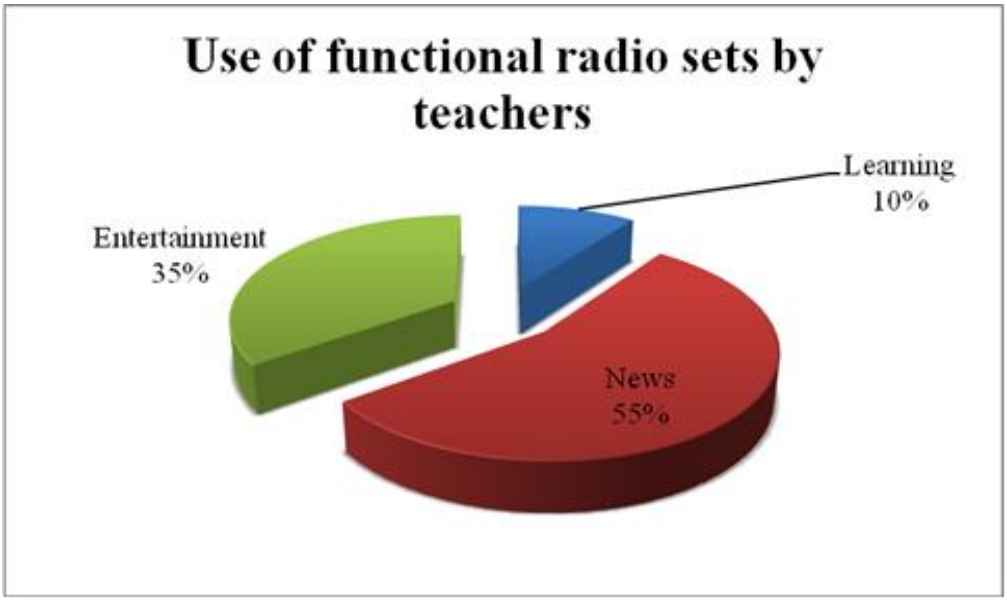

Figure 4. Learners view on what radio sets are used for in schools
(Source: Field Survey 2015)

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.

Question 4

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 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.

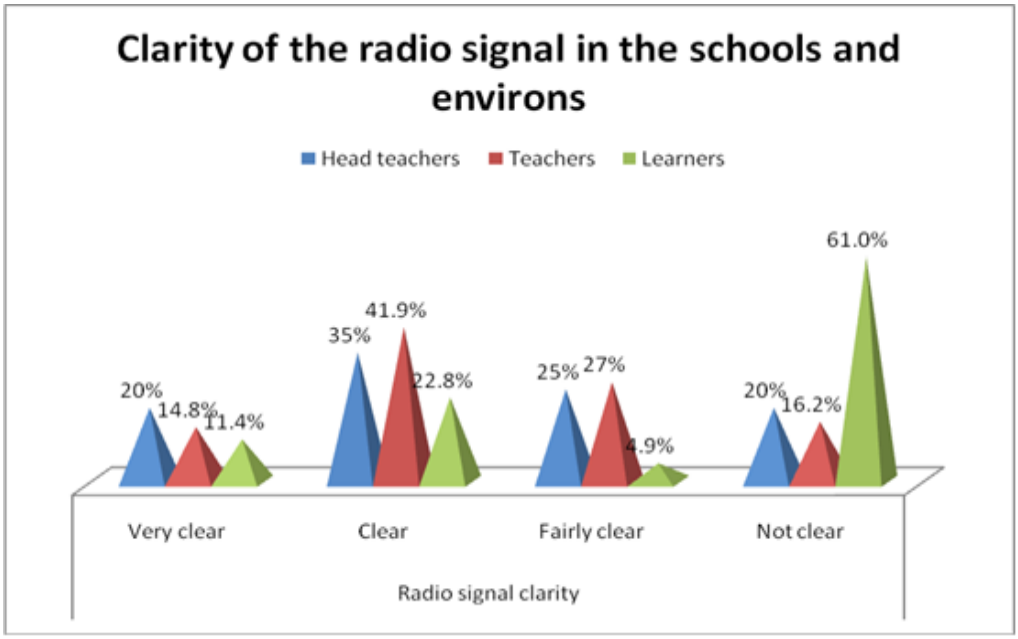

Figure 5. Clarity of the radio signal in schools (Source; Field Survey 2015)

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 6 below.

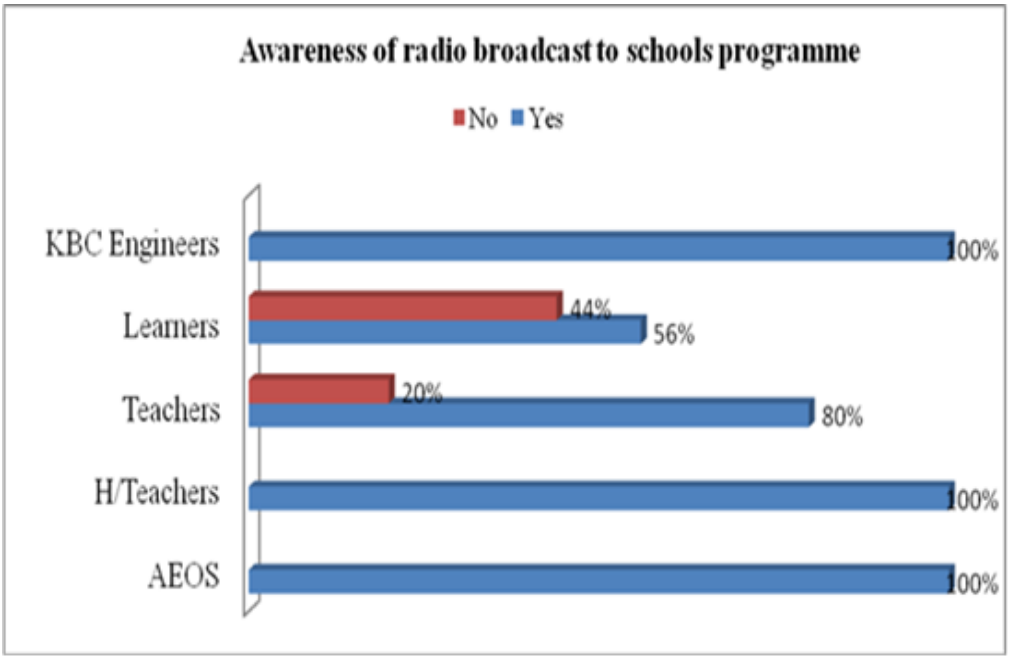

Figure 6. Awareness of radio broadcasts to schools programme
(Source: Field Survey 2015)

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 7 below.

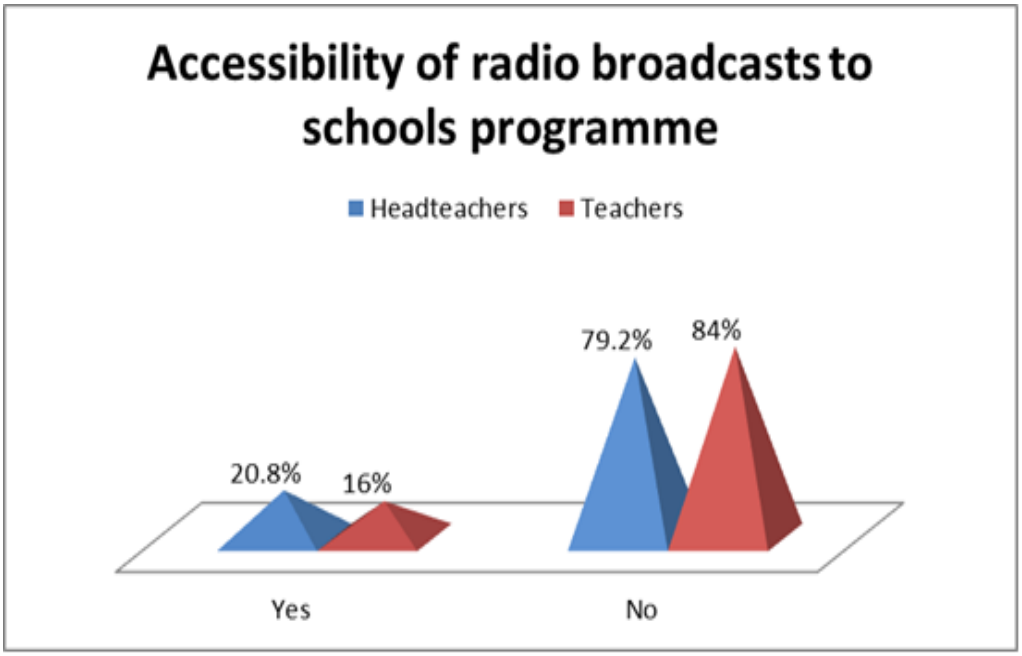

Figure 7. Accessibility of radio broadcasts to schools programme
(Source: Field Survey 2015)

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 1 below. Reference points were taken from respective entries from the headteachers column, yielding positive and negative disparities as shown in the table.

Table 1. Challenges faced by schools in the accessibility of radio broadcast (Source; Field Survey 2015)

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

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: 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 2 below.

Table 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.

Question 5

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 8 below.

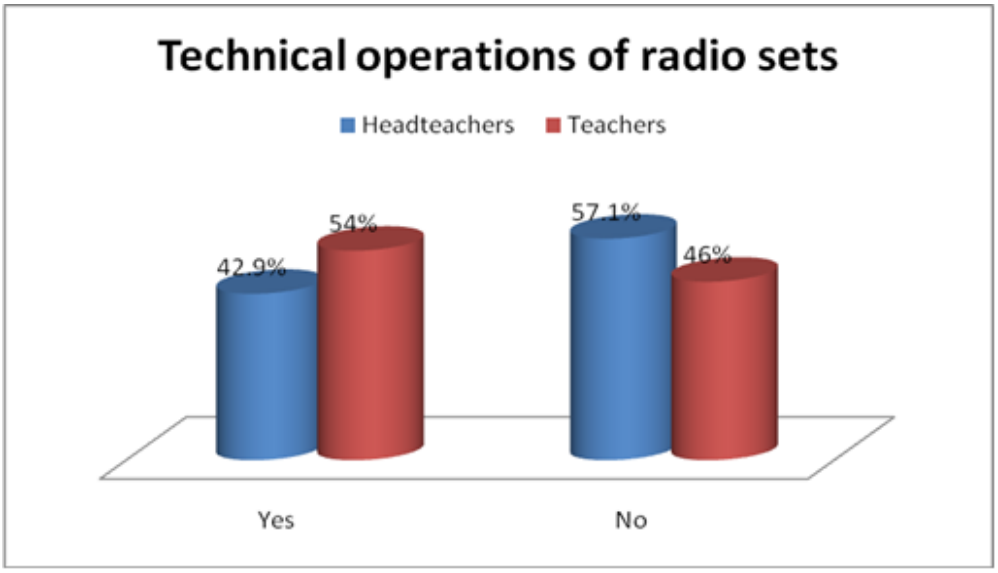

Figure 8. Technical know-how on the operations of the radio sets
(Source: Field Survey 2015)

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.

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.

Conclusions

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, AEOsor 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.

Recommendations

1) 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.

2) 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.

3) 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.

4) 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.

5) 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.

6) 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.

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Conflicts of interest

The author declares no conflicts of interest.

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