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HISTORY OF EDUCATIONAL RADIO IN KENYAN SCHOOLS: AN ANALYSIS OF PROSPECTS AND CHALLENGES

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Abstract: The radio is a powerful audio aid and an important media for education. It is one of the most effective means of imparting education to a large number of people. The work of scientists such as Nikola Tesla, Guglielmo Marconi, Lee De Forest and others are credited with all forms of radio broadcasting which started in the late 1800s. in the early days the radio was mainly used by the military during the first and second world wars. This paper traces the historical development and evolution of radio. It also examines global success stories of use of educational radio and focuses on Kenya's experience highlighting the legal framework, the prospects and challenges. The history of educational radio has been dynamic due to growth and development in educational thinking and the technological environment. The U.S., Canada and Australia had a strong background in implementing educational radio broadcasts in the 1920s and 1930s, which were referred to as Schools of the Air. The Interactive Radio Instructions (IRI) adopted a conversation technique between the radio teacher and the students unlike the conventional radio broadcast. This format, however, remains limited in its interactivity and is teacher-centred. In studies conducted all over the world, in both developing and developed countries has demonstrated that when radio is used as a supplementary tool, it benefits weaker students. IRI projects were funded by USAID in developing countries including Nicaragua, Bolivia, Kenya and Lesotho. The history of instructional radio in Kenya dates back to 1963. The Ominde Commission acknowledged the significance of the school radio as a valuable teaching aid. Radio has proven educational worth in terms of pedagogical importance and geographical reach. Up to 1992 school broadcasts were on air through the Voice of Kenya(VoK) which later became Kenya Broadcasting Corporation(KBC) which airs the radio programmes to date. The Kenya government funds the radio broadcasts to schools through Kenya Institute of Curriculum Development under Media and Extension Services to schools. Many schools in Kenya do not make use of the educational radio and many teachers and learners are not aware of the existence of educational radio. The radio is here to stay despite recurrent innovations and scientific breakthroughs.

Key words: Educational Radio, Radio Broadcasts, Interactive Radio Instruction

INTRODUCTION

The development of the radio can be traced to the dawn of the twentieth century. The work of inventors such as Nikola Tesla, Guglielmo Marconi, Lee De Forest and others laid the foundations for all forms of radio broadcasting. Prior to the 1920s the radio was primarily used to contact ships that were out at sea. Radio communications were typically achieved by the use of Morse code messages. During the First World War, the military used it almost exclusively and it became an invaluable tool in sending and receiving messages to the armed forces. Radio plays an important role in communication for police, fire brigade, Red cross, medical emergencies (Flying Doctor Services, Ambulances) and the military.

The earliest users include the Japanese Navy who used radio for scouting Russian fleet during the battle of Tushima in 1905. It was used during the sinking of the RMS Titanic in 1912. In the early days radio was used to pass orders and communication between armies and navies during the 1st World War. In this war the military used radio waves in the form of radar to locate ships. The military leaders recognized its value for communicating with the infantry and ships at sea. During the second World War, the radio was used to relay the news of the war to the public. It

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was a rallying source and was used by the governments of the UK and US to gain public support. The military uses radar to locate ships and aircraft.

In the 1920s, following the war, radios began to increase in popularity amongst civilians, and radio stations began transmitting to a small; but growing number of listeners. This growing popularity also led to an increase in its use in education. The reach and the immediacy of radio provided educators with a new and potentially powerful medium through which to support and modify education. The purpose of educational radio from the outset, has been to complement the existing curricula. Educational radio broadcasting has undergone significant changes in the not so recent past. Emerging issues in the society and changes in educational theory, learning theory and technological developments have influenced these changes. Initially educational broadcasting was expected to reduce the need to train teachers during the 1950s and 1960s in the European countries. These broadcasts were conceptualized according to pedagogical criteria. In the period between early 1970s and mid 1990s broadcasting was seen as educationally restrictive; using a technology that allowed for interaction in a very limited sense and therefore inappropriate for education.

However, there was renewed optimism in the period from mid-90s to the late 90s when a clearer understanding of what educational broadcast could achieve and its strengths emerged. Specific educational audiences were encouraged to make use of educational broadcasts as learning resources. In many countries with advanced technology educational broadcasters have become educational resource providers.

GLOBAL EXPERIENCES

While educational radio developed in different forms depending on the country and specific conditions, its primary goal was to complement and improve existing educational programs (Bagley, 1944). Radio programmes were not intended to supplant existing text-based educational curriculum; but to supplement or to stimulate, the study of subjects in schools (Hinrichs 2004, Ackerman 1945). Educational theory of the day proposed that active engagement of students in materials, interactivity and engagement between teachers and students, as well as opportunities for more experiential learning would create a more solid, successful learning environment (Dewey, 1938). By being offered in conjunction with traditional text-based curricula, educational radio made all of this possible.

Radio broadcasts in the United States, Europe, Canada and Australia were viewed as Schools of the Air, SOTA (Williams *et al*, 2005, Wangu, 2015).In Australian SOTA distance education programs, every student is provided with a mail delivered printed program with accompanying resources. This material is then supplemented by on-air lessons (Australian Government,2007). Students would work on printed curricula that would then be sent to the SOTA teacher for marking. Radio's involvement in supporting and strengthening text could occur before, during and after the writing process: teachers could provide direct lessons via radio on the written material, provide ongoing engagement and consultation with the student while working on the assignments, and finally, provide feedback on completed and evaluated work (Fowler, 1987). This process provided a level of connectedness due to the synchronous communication afforded by radio that would not be possible with previous postal-only distance education programs, and allowed students to feel less isolated, and in turn, more engaged in their lessons. In addition, students and teachers were involved in an educational experience which included and valued orality as well as literacy, contributing to the overall literacy education of the students.

Moreover, much of the research in distance education programmes to date has shown that the use of multimedia technology in general has led to increased achievement among distance learners over classroom learners (Williams, Nicholas and Gunter, 2004). In Australia, the delivery of distance education, and thus the literacy education of students were significantly enhanced by the inclusion of radio in education.

The United States and Canadian radio educational systems differed significantly in overall design from the Australian version, though they had the potential to change educational practices and facilitate reading and writing. The Ohio SOTA suggested that the programs offered "creative possibilities for English, speech and dramatics teachers in developing students' interest in radio writing and radio production"(Reid, 1942). The reading and writing of text was promoted by educational radio. Using radio promoted a new form of educational technology while introducing potentially new, progressive teaching technologies into the classroom setting. According to

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Boulter(2001), the radio remediated print technology such that text technologies such as the newspaper became secondary to the radio in engaging and interacting with students. Teachers were able to draw on resources outside the classroom in a new way with a sense of immediacy that would not be possible in pre-radio forms such as newspapers or films. In addition, with the distribution of the teachers' guides, programmes such as Columbia Broadcasting Systems American SOTA were able to assist the teacher in using the provided programmes to their best suggested potential, foreshadowing the lucrative teacher resource business that exists currently in education.

Examples of Educational Radio Projects

Interactive Radio Instruction, IRI

Interactive radio instruction (IRI) is a distance education system that combines radio broadcasts with active learning to improve educational quality and teaching practices. IRI is associated with projects sponsored by the United States Agency for International Development, USAID beginning with the Radio Mathematics Project in Nicaragua in mid 1970s. The term "interactive" was coined because of the active participation of the children during the radio programs. Although the lessons are presented by the conventional radio, the scripts are written to solicit responses from the children every few seconds. The children talk back to the radio,; they also sing, write, read, manipulate simple materials, and do physical exercises (Bosch, 1997; Wangu, 2015).

IRI programs require teachers and students to react verbally and physically to questions and exercises posed by radio characters and to participate in group work, experiments, and other activities suggested by the radio program.

IRI programs are also noted for their high quality curriculum design. Extensive care is taken to incorporate the most effective learning sequences. Furthermore, as the lessons are produced, classroom observation and achievement data are regularly collected and analyzed to modify and improve the lessons through a systematic formative evaluation process. The lessons also incorporate sound pedagogical principles including active participation by the learners, distributed learning of new topics, immediate feedback on the correctness of students responses, systematic review of the material already taught, and a lesson format that is lively and varied. The first IRI project was a Radio Mathematics program, introduced in Nicaragua in 1974.

Radio Mathematics in Nicaragua

The Radio Mathematics Project (RPM) was a joint venture of Nicaraguan Ministry of Public Education and USAID through Stanford University's Institute for Mathematical Studies in the Social Sciences. It was an innovative approach to bring together two related technologies; radio and systematic instructional design and to evaluate their effectiveness in teaching primary school mathematics.

Nicaragua faced the common problem of a scarcity of fully qualified teachers, particularly in schools outside of major urban areas. In such settings, conventional primary school curricula often do not serve the basic literacy and numeracy needs of rural students, the RMP attempted to improve the quality of mathematics instruction with a curriculum focusing on basic skills in a context relevant to the rural children it served. RMP functioned entirely within the formal primary school system following the country's mathematics curriculum. Radio, the primary instructional vehicle, was used to broadcast daily thirty-minute lessons to children in the second, third, and fourth year of primary school respectively. The lessons were supplemented by teacher-led post-broadcast activities. By 1979 RMP was clearly a success.

The work in Nicaragua identified a number of principles concerning the effective use of instructional radio and related techniques of instructional design which were applied to good advantage in the Radio Mathematics Project in Bolivia (1987) and Radio Language Arts Project in Kenya in 1981. The RMP proved that an appropriate use of radio could maximize the medium's advantages and minimize the medium's disadvantages to produce a cost-effective educational technology.

The Kenya Radio Language Arts Project

This was a five-year (1981 – 1985) research and development project funded by USAID in cooperation with the Kenya Government and Ministry of Basic Education at the time through the Kenya Institute of Education. The project was aimed at testing the feasibility of adaptation of the successful Nicaraguan Maths project to a new subject area. It was to systematically assess the costs and benefits of intensive use of radio as the principal vehicle for lower primary level of English instruction in rural areas in Kenya. Radio Language Arts Project, RLAP was to develop, implement and test the effectiveness of an instructional system that uses radio intensively to teach English

as a foreign language to lower primary school level. The Kenya RLAP documented the effectiveness of interactive radio-based educational instruction. Analysis done in the areas of listening, reading, speaking and writing showed that children in the radio classrooms consistently scored better than children in non-radio classrooms in every test. The achievement tests were based on the official Kenya curriculum for those classes; standards 1 to 3.

This success led to the project being adapted in other countries; one of which was Lesotho. IRI lessons were introduced as part of the USAID Basic and Non-Formal Education Systems (BANFES) project in 1987.

English language skills are crucial for success in school because, after four years of schooling, English becomes the medium of instruction. At that time the many Basotho educators believed that the standards of English in the schools had declined in the recent years. The English Division of the National Curriculum Centre in Lesotho decided to adapt the IRI lessons originally developed by the RLAP in Kenya. They called it the *New English In Action* series that ended up being used in 90% of the schools in Lesotho, reaching over 200,000 pupils in Grade 1 to 3. As the BANFES project closed down by mid-1991, the Ministry of Education incorporated in their budget the recurrent costs for maintaining the IRI series.

In this section it can be seen that IRI in schools in the developing countries towards the end of the twentieth century and even early years of twenty-first century (for instance in Sudan) were funded by International donors mainly USAID in conjunction with the governments of those countries.

Legal Framework for the Use of Educational Radio in Kenya

The use of the radio as a teaching aid in Kenya has been supported by the education commissions to look into the education matters in the country. After independence, the government appointed the Ominde Commission (RoK, 1964)to survey the existing educational resources and advise the government in the formulation of national policies for education. The commission considered the use of radio as a teaching aid given the poor communication, the isolation and relative poverty of many schools at independence reduced greatly the teachers' opportunities to bring illustrative materials in the classroom.

The radio provides a wonderful means of bringing the outside world into the school. Remote parts of the country come to life over the radio and its lessons are much more significant and real than lessons relying solely on the skill and imagination of the teacher. The commission considered the 'school radio' as a valuable teaching aid and welcomed the extension of its use.

The 'school radio' was seen to be relevant in the teaching of history, civics, geography and the sciences. Its value was also seen in connection with the correct teaching of English and Kiswahili where it made up for the teachers' own limitations in pronunciation and sentence construction. The commission, however, recognized that the radio cannot be a substitute for the teacher; but as a teaching aid has a body of material to be discussed and can supplement the resources of teachers with limited basic education.

The value of the 'school radio' is dependent on the use made of it by the teacher; however for the untrained teacher good notes produced by the Voice of Kenya are invaluable and may help this teacher though the instinctive element to teach has no substitute. Since the most productive use of 'school radio' requires familiarity with its technical possibilities, all teacher training colleges were urged to bring it into their training programmes.

Instructional Radio in Kenya

The history of instructional radio in Kenya dates back to 1963 as a School Broadcasting unit of the Ministry of Information and Broadcasting and based at Mombasa House in Nairobi. In 1965 the Schools Broadcasting Service was taken over by the Ministry of Education. In 1976 it was absorbed in the Kenya Institute of Education as the Educational Media Services (EMS) to produce a variety of teaching aids including video programs, films, posters, charts and books as well as radio programs. EMS produced school radio broadcasts to support key areas within the curriculum, difficult areas for both learners and teachers within individual syllabuses, health and environmental education. This was a national strategy of improving standards and to widen access to education, to improve teacher qualification and to extend educational opportunities beyond the school through distance learning and teaching so that a large number of people both young and old, in urban and rural especially nomadic communities and other disadvantaged groups could take part in the radio programmes. At this time the recording and broadcasting facilities of the Voice of Kenya (VoK) supported the schools broadcast system.

In 1963, broadcast to schools were on air for one hour a day, with 8 programs for primary schools and 4 for secondary schools each week. This gradually increased and by 1983 term one radio time-table for school broadcasts included 59 instructional radio programs (excluding repeats); 31 for primary schools for standard 2 to standard 7 (including five for Radio Language Arts Project broadcasts each week); 20 for secondary schools from form one to form six, and 8 for teachers (including four for untrained teachers to support their in-service training course). By 1983, educational broadcasts were on the air through VoK for five hours twenty minutes a day, Monday through Friday, eight weeks a school term or 640 hours per year of instructional radio.

Broadcasts to primary classes lasted 15 – 20 minutes. They covered English, history, geography, music and movement, Kiswahili, Health Education and Home Science. Secondary school broadcasts were 20 minutes each covering biology, history, English literature, CRE, English usage, creative writing, geography, agriculture and Kiswahili. Secondary school students could also listen to a careers program and a guest forum which assisted A- Level students with topics for the General Paper examination. There were three kinds of teacher training programs on the schools broadcasts. The first one was for methodologies for specific subject areas, the second one was on areas of general interest (for example *You and Your Health*) and a third one on support for in-service training (for example broadcasts for untrained teachers).

Schools broadcasts were essentially supplementary in purpose, designed to help the teacher by offering one radio lesson per week to assist regular classroom instruction. They were supported by a range of printed material, including charts, teacher guides and pupil booklets. The Ministry of Education supplied radios to all primary schools through the Kenya School Equipment Scheme while secondary schools responsible for their own budgets, purchased their own radio receivers.

Another use of formal education broadcasts in Kenya then was to upgrade teachers in response to a great need for more trained teachers caused by rapidly rising school enrolments. Under the direction of the Correspondence Course Unit at the Institute for Adult Studies at the University of Nairobi, radio broadcasts supplemented a correspondence-based instructional system to provide academic upgrading for classroom teachers.

In 1992, VoK which later became Kenya Broadcasting Corporation KBC obtained corporate status and increased cost of transmission. In addition the training of production and technical staff made the program very expensive and the government could not continue to finance the programme(Asiago *et al*, 2014) . The Ministry of Education could therefore not meet the high cost of airtime through the exchequer. In 1995, broadcast to schools through the KBC was discontinued due to the high costs of production and transmission faced by the government(Edwin, 2007; Asiago *et al*, 2014; Omulo,2015). Programmes continued to be produced and disseminated to schools in the form of compact disks and cassettes.

The Ministry of Education, Science and Technology through KIE introduced the World Space radio to schools on a pilot basis in 2001. World space radio is a satellite radio that offers its digital satellite audio, data and multimedia services internationally.

Use of radio broadcasts were revived in 2003 after introduction of Free Primary Education, FPE. To meet the challenges of FPE, the Kenya Government introduced World Space radio broadcast to schools to supplement and improve class teachers' work and quality of education at a distance (Odera, 2005). The space radio was funded by the World Bank.

By 2006, 16000 primary schools were supplied by world space receivers which turned out to be complex to operate, only KIE technicians could repair the receivers and it turned out to be quite a costly affair. KIE broadcast to schools resumed through KBC English Service in early 2007, thus reducing the cost since ordinary radios could be used.

Currently, the government continues to fund radio broadcasts to schools through Kenya Institute of Curriculum Development, KICD under Media and Extension Services to Schools. KICD develops interactive radio lessons with education curriculum experts and other stakeholders for learners in primary, secondary and tertiary institutions including the general public apart from the university levels.

Educational radio programmes are usually broadcast live to schools through the national broadcaster Kenya Broadcasting Corporation ,KBC with coverage of over 95% of the country. This radio broadcast airs programmes using a timetable that has been scheduled by KICD(Manyara, 2014). The timetable shows that the broadcasts are aired on KBC English Service during

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school days Monday to Friday from 9.15 a.m. to 4.00 p.m. There are ten 20-minute broadcasts in one day with more slots and mainly morning hours for upper primary schools and fewer afternoon slots for secondary schools.

The broadcasts to primary schools for class 4 – 8 cover the following areas: English, Mathematics, Science, Kiswahili, IRE,CRE, Social Studies, Life Skills, Peace Education, Civic Education, Drug and Substance Abuse.

The secondary school broadcasts are mainly for forms 3 and 4 and cover the following areas: Literature Set books for both English and Kiswahili, English, CRE, Geography, History and career information.

The following important tips are given alongside the timetable:

i. During school holidays educational programmes for the general public will be broadcast

ii. All the radio programmes are available for sale in cassettes, CDs and other storage devices at the KICD multimedia bookshop. They can also be accessed online.

iii. Video cassettes and DVDs in various subjects and e-learning, National Science Congress, Drama and Music festivals are also available for sale

iv. Broadcast guides for the various subjects are available in the KICD bookshops and various outlets in the counties.

However, what is noteworthy is that mathematics and sciences are left out of the radio programmes for secondary schools. This may give the wrong impression to the youth concerning the importance of science subjects.

Prospects for the Use of Radio in the classroom

Radio broadcast can reach the whole target population spread across the geographical expanse of the country. The flow of information is of uniform quality and everyone has access to the same content. It delivers high quality educational programming to highly diversified audiences located from North Eastern to the South Coast, Western Kenya to Eastern regions all at a low per unit production cost.

The radio has been found to improve the quality and relevance of education. It lowers the educational costs per student. It improves access to education particularly to disadvantaged groups in those hitherto inaccessible and very remote locations. It brings the curriculum and teacher training to classrooms in a developing country such as Kenya.

Radio is more cost effective and capable of exerting greater learning effects than text books and or teacher-only presentation. It does permit the teaching of subjects in which classroom teachers are untrained or lack certain requisite knowledge.

Radio can be utilized effectively in an integrated class with serious individual differences such as visual impairment to provide instruction for one group of students while the teacher is occupied with another.

Radio greatly enhances student learning by bringing new previously unavailable resources into the classroom. Since the radio has become more personalized and one can listen to it in privacy, it is often the preferred choice for those seeking information on culturally taboo topics such as HIV/AIDS and STDs. The messages about peaceful co-existence among various ethnic groups and national cohesion can be passed effectively through educational radio broadcasts.

Challenges in radio broadcasts to schools

The government through the Kenya Institute of Curriculum Development, KICD has heavily invested in the radio programme, yet many schools do not make use of the radio broadcasts according to research findings in the recent past(Omulo,2015; Wangu, 2015). Most head teachers and teachers including even learners attribute this to lack of functional radio sets in schools and lack of electricity power connections to schools. Poor radio signal reception in other areas, lack of sensitization in schools, lack of prompt distributions of broadcast timetables by KICD to schools and lack of technical know-how on the operations of the radio sets by the teachers. The teachers do not have enough knowledge and skills on the use of education broadcast.

The government does not provide funds to schools to buy or purchase radio transistors in schools or broadcast support materials for teachers. These should be provided the same way as with textbooks and find ways for maintenance and repair to make the programme sustainable.

KICD should monitor the programme closely to find the needs of the teachers and learners and discover ways to make the programme more effective. The examinations oriented syllabus together with an over-loaded curriculum makes the teachers and

school administration see the educational radio as a time-consuming distraction rather than a teaching resource.

Most teachers and learners are not aware that school educational radio broadcasts exist!

Regarding the use of radio for educational purposes, some limitations include:

- it inherently lacks interaction
- instructor feedback and clarification are generally unavailable
- instruction cannot be interrupted or reviewed (unless it is tape recorded)
- the pace of the lesson is fixed
- note taking is difficult for some of the lessons
- time for reflection is minimal

The future of radio use in schools

Educational radio is seen as a pioneer of educational technology and set the stage for other technologies such as television, video conferencing and will continue with other technologies in future. As technology keeps evolving, radio will be right at the centre of this evolution. It remains a significant part of educational technology despite recurrent innovations and scientific breakthroughs. With the advent of internet radio and podcasts teachers should create their own radio programmes in and for use in the school. This would make students more attentive and involved.

Radio could also focus on teachers and assist them in learning new or modern pedagogical approaches. It could be quite cost-effective and time-saving in inducting teachers in service on the new competency based curriculum.

Radio supports text-based education, student literacy and the foundations of educational radio provides a framework for future efforts in the implementation of educational technology. The radio on its own is not enough to make learning effective and efficient. There is need to incorporate ICTs to make radio relevant in the current information age. Educational television, video, tape recorders, projectors, graphics and illustrations can complement radio to support learning.

Conclusion

The invention of radio has brought a great revolution in the world of communication generally and education specifically. It holds endless opportunities in the field of education both as a teaching learning resource and an area to study.

The use of radio to train and retrain teachers on content and methods of teaching have been quite successful. It can be of great help in Kenya currently with the rising number of learners in schools following the rapid expansion and where there is acute shortage of qualified teachers, well equipped laboratories and other necessary infrastructure for growth of education.

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