FACTORS INFLUENCING THE UTILIZATION OF WORLD SPACE RADIO IN TEACHING AND LEARNING: A CASE OF PUBLIC PRIMARY SCHOOLS IN UGENYA DISTRICT IN SIAYA COUNTY, KENYA.

BY

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DECLARATION

The research project report is my original work and has not been presented to any other university for a degree or any other award.

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

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DEDICATION
This project report is dedicated to my wife Anastasia, our children, Glen, Elizabeth, Margaret and Ceasar for their financial, material and moral support during this study. Without their cooperation and understanding this project would not have been accomplished
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My sincere thanks go, first, to the Department of Distance Studies of the University of Nairobi for introducing this unique course. Second, I wish to register my appreciation to Dr. Naomi Mwangi Gikonyo for her helpful guidance and encouragement in this study so far. Special thanks also go to all my lecturers in the department of distance education who have offered me the requisite knowledge that was later helpful in undertaking this project. I also wish to thank my classmates who over the duration of study have offered a conducive environment needful for an excellent academic discourse that was necessary for this study. I would also wish to acknowledge the invaluable help given to me by the Ugenya District primary school administrators and teachers in my bid to get information relevant for the study.
ABSTRACT

In order to meet the challenges of free primary education, the Kenya Government introduced world space radio broadcasts to schools to supplement or improve classroom teachers’ work and the quality of education at distance. However, there appears to be improper utilization of world space radio mainly due to certain factors mainly propagated by the school leadership and lack of compatible infrastructure. This study therefore aimed to determine the extent to which availability of World Space radio complementary infrastructure influenced utilization of world space radio in teaching and learning; explore the extent to which teachers’ experience and preparedness influenced utilization of world space radio in teaching and learning; establish the extent to which content to curriculum influenced utilization of world space radio in teaching and learning; and explore the extent to which teachers’ attitude influenced utilization of world space radio for teaching and learning in primary schools. It was based on the opens systems theory and the study adopted a descriptive survey research design. The target population comprised of the 3500 teachers of the 80 primary schools in Ugenya District. The study further employed both simple random sampling and purposive sampling. Simple random technique was used to select 346 teachers while purposive was used on the DEO. The study used questionnaires and interviews in data collection. Reliability for this study was tested using split half method while validity was tested using randomisation technique. Data was analyzed using descriptive analysis and Pearson’s Correlations and presented in tables. The results show that lack of availability of WSR complimentary infrastructure, lack of teacher experience and preparedness, irrelevant content for WSR curriculum and poor teachers’ attitude significantly negatively influenced Utilization of WSR in teaching and learning in Primary schools in Ugenya District. The study therefore recommends that: The government through the Ministry of Education and Finance should provide more funds for acquisition of WSR complementing infrastructure to consequently breathe life to WSR for teaching and learning by pupils. School administrators should on the other hand, prudently make use of WSR complementing infrastructure already at their disposal. Teachers should embark, with the help of their respective school administrators, on effective WSR lesson planning which would spur teacher preparedness of WSR for teaching and learning. The teachers should seek to expose themselves more to WSR so as to improve on their experience on WSR. Curriculum developers should review WSR content to make it more current and relevant particularly for pupils in rural schools. The developers should promote local teacher involvement in content formulation to help tailor make the content to suit local pupils and consequently improve teaching and learning using WSR. School managers should proactively promote the benefits of WSR in teaching and learning to help create a positive attitude of the innovation among the teaching staff. They should do this through seminars, workshops and motivational talks, inviting resource persons who have successfully utilized WSR. The Ministry of Education should review the ICT policy to pay special focus on WSR adoption in primary schools for effective teaching and learning.
# TABLE OF CONTENTS

DECLARATION .................................................................................................................. i
DEDICATION ...................................................................................................................... iii
ACKNOWLEDGEMENT ...................................................................................................... iv
ABSTRACT ........................................................................................................................ v
LIST OF TABLES ............................................................................................................. ix
LIST OF FIGURES .......................................................................................................... x
LIST OF ABBREVIATIONS AND ACRONYMS ................................................................. xi

## CHAPTER ONE- INTRODUCTION ................................................................. 1

1.1 Background of the Study ......................................................................................... 1
1.2 Statement of the Problem ...................................................................................... 6
1.3 Purpose of the Study ............................................................................................ 7
1.4 Objectives of the Study ......................................................................................... 7
1.5 Research Questions ............................................................................................... 8
1.6 Significance of the Study ..................................................................................... 8
1.7 Delimitation of the Study ..................................................................................... 9
1.8 Limitations of the Study ....................................................................................... 9
1.9 Basic Assumptions of the Study ......................................................................... 9
1.10 Operational Definition of Terms ........................................................................ 10
1.11 Organization of the Study .................................................................................. 11

## CHAPTER TWO- LITERATURE REVIEW ......................................................... 12

2.1 Introduction ........................................................................................................... 12
2.2 Use of Radio in Teaching and Learning ............................................................... 12
2.3 World Space Radio in Education and Development ........................................... 18
2.4 Availability of WSR complementing infrastructure and its influence on WSR utilization. 20
2.5 Teacher Experience and Preparedness and Utilization of radio programme ............... 22
2.6 Relevance of Content to WSR Curriculum and Utilization of Radio Programme ....... 23
2.7 Teachers Attitude about the Use of radio in teaching and learning.......................... 26
2.8 Theoretical Framework ......................................................................................... 29
2.9 Conceptual Framework ......................................................................................... 30
2.10 Summary and Research Gaps ............................................................................... 31

CHAPTER THREE- RESEARCH METHODOLOGY ............................................ 32
3.1 Introduction ........................................................................................................... 32
3.2 Location of Study .................................................................................................. 32
3.3 Research Design .................................................................................................. 32
3.4 Target Population ................................................................................................. 33
3.5 Sampling Techniques and Sample Size .................................................................. 33
3.6 Data Collection Instruments ................................................................................ 34
3.7 Reliability of Research Instruments ...................................................................... 35
3.8 Validity of Research Instruments ......................................................................... 35
3.9 Data Analysis ........................................................................................................ 36
3.10 Ethical Consideration ......................................................................................... 36
3.11 Operational Definition of Variables .................................................................... 37
3.12 Summary ............................................................................................................. 38

CHAPTER FOUR- DATA ANALYSIS, PRESENTATION AND INTERPRETATION.... 39
4.1 Introduction ........................................................................................................... 39
4.2 Response Rate .................................................................................................... 39
4.3 General characteristics of the Respondents ......................................................... 39
4.4 Availability of WSR Complementing Infrastructure ............................................. 42
4.5 Influence of teachers’ experience and preparedness on WSR in teaching and Learning ....45
4.6 Influence of content to curriculum on Utilization of WSR in teaching and Learning ........48
4.7 Influence of Teachers’ Attitude on WSR in teaching and Learning ..........................51
4.8 Correlation Analysis ..........................................................................................53
4.9 Summary .........................................................................................................54

CHAPTER FIVE- SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION AND
RECOMMENDATIONS ..........................................................................................55
5.1 Introduction ......................................................................................................55
5.2 Summary of Findings .....................................................................................55
5.3 Discussion of the Findings .............................................................................57
5.4 Conclusion of the Study ..................................................................................62
5.5 Recommendations .........................................................................................62
5.6 Suggestions for further research .................................................................63
5.7 Summary .........................................................................................................63

References ............................................................................................................64

Appendices ..........................................................................................................67
Appendix 1- Introduction Letter .........................................................................67
Appendix 2: Questionnaire for teachers ............................................................68
Appendix 3: Interview Schedule For DEO ..........................................................73
Appendix 4: Authority Permit from Ministry of Education ...............................74
Appendix 5: Authority Letter from the Department ............................................75
Appendix 6: Kathuri and Pals (2006), Sample Size Table .................................76
LIST OF TABLES

Table 3.1 Operational Organization of Variables.................................................................38
Table 4.1 Gender of Respondents * Age of Respondents Crosstabulation.................................40
Table 4.2 Type of School........................................................................................................41
Table 4.3: Setting of School.....................................................................................................42
Table 4.4: Availability of WSR Programme..............................................................................42
Table 4.5: Availability of WSR Compatible Infrastructure......................................................43
Table 4.6: Subjects WSR is used to Teach..............................................................................43
Table 4.7 Challenges of Power Outages..................................................................................44
Table 4.8 Teachers’ experience and preparedness on WSR in teaching and Learning..............46
Table 4.9 Influence of content to curriculum on WSR in teaching and Learning....................49
Table 4.10 Influence of Teachers’ Attitude on WSR in teaching and Learning.......................51
Table 4.11 Correlations............................................................................................................53
LIST OF FIGURES

Figure 1 Conceptual Framework ................................................................. 30
LIST OF ABBREVIATIONS AND ACRONYMS

AM – Amplitude Modulated

FM – Frequency Modulated

FPE- Free Primary Education

ICT- Information Communication Technology

IRI- Interactive Radio Instruction

KIE- Kenya Institute of Education

MOEST- Ministry of Education Science &Technology

ODL- Open Distance Learning

RLA- Radio Language Arts

UNDP- United Nations Development Program

UNESCO- United Nations Educational Scientific and Cultural Organization

WSR- World Space Radio
CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Since the introduction of Free Primary Education (FPE) in Kenya when the Narc government of President Kibaki came to power in 2003, many primary schools have experienced large enrolment of pupils in classes one to eight such that in some schools there are over 100 pupils per class with only one teacher (Eshiwani, 2004). Such increased enrolment has been influenced by the removal of tuition fees, and provision of free learning materials (Abayi, 2004). Some schools have not been doing well due to lack of teachers and relevant resources, while others have managed to perform well. The large number of students who join school continue to be so large that the impact is far reaching and causing a lot of concern due to inadequate physical facilities, teaching and learning resources and qualified teachers (Eshiwani, 2004).

In order to meet the challenges of Free Primary Education, the Kenya Government introduced world space radio broadcasts to schools to supplement improve classroom teachers’ work and the quality of education at distance (Friends, 2009). The biggest change that faces free primary education is more on access to quality learning rather than quantity (Odero, 2010).

According to Odero (2010), the systematic development and utilization of radio broadcast for school began in Kenya in the 1960 as a national strategy for improving the standards of education, to widen access to education, to improve teachers’ qualification and to extend educational opportunities beyond the school through distance learning and teaching so that large number of people both young and old in rural as well as urban could take part. It was also
recommended to be used in schools where no alternatives for education exist, and to motivate students to learn so that the probability of students dropping out could be reduced.

For many years radio programme have been used in Kenyan schools for distance 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 that was faced by the Government (Odero, 2010; Christen, 2008).

In recent years, however, interest in radio was revived, and in order to improve the information base in radio’s potential in education and development, the World Bank funded World Space Radio so that relatively isolated rural population that have had limited or no previous education could be reached to overcome the handicaps by offering distance education (Fermich, 2007). Currently radio lessons are broadcasted during normal school hours by World Space Radio in conjunction with Kenya institute of Education.

Hawkridge and Robinson (2002) argue that world space satellite Radio has created a new way for people across the world to listen to radio by 100% digital quality with an ability to be heard clearly all over the world. World Space Radio has been the first to create multimedia education programmes via satellite radio in Kenya. Pakistan and countries around the world and to demonstrate and test satellite radio in Europe.

World Space Radio uses its two satellites, Afristar and Asiastar, to broadcast more than 100 digital quality audio channels to people around the world. Each satellite has three beams directly to portable in car and per receivers. Also, each world space receiver is equipped with a data part
that transforms it into a wireless modem. Thus, the world space receiver can also broadcast multimedia content to provide educational content to a student population that really needs it.

Heinich et al (2002) says that the objective of educational radio broadcasts in Kenya is to transmit and distribute to schools and the general public educational information over the radio or television, thus improving and enriching education in a distinct and specialized way.

Radio programmes assist teachers in taking unfamiliar topics through the way in which the curriculum content is presented (Anzolena, 2008). Some teachers find the programmes useful to revise what they have taught and to introduce new topics at certain times. In some schools, teachers use radio programmes to overcome the shortage or lack of reference books, classroom textbooks and other conventional instructional materials. However, all of these instructional radio advantages are possible only if the programmes are professionally prepared and pre-tested at all levels to ensure that they achieve the goals of teaching and learning (Heinich et al, 2002). Further, according to Friend (2009), there are factors that influence the use of world space radio as part of the wider ICT spectrum.

The rapid and pervasive implementation of new information and communication technologies (ICT) that WSR is part, in the education system raises expectations regarding its potential for and contribution to the improvement of education. In spite of the accelerated implementation pace of ICT infrastructure in the educational system, including world space radio, are only at the beginning of a long process (Venezky and Davis, 2001). The goal of this study is to examine the factors influencing successful utilization of innovative pedagogical practices using world space radio within schools.
Educational change is a compound of complex and dynamic processes involving the transformation of teachers’ behavioral patterns, changes in the school’s identity, improvement of student performance and adaptation to environmental changes. Many researchers deal with the study of factors assisting or inhibiting the success of educational change in general (Fullan, 2001; Kinsler and Gamble, 2002), and specifically with relation to ICT (Berman and McLaughlin, 2004; McLaughlin, 2009). Some emphasize organizational aspects and the means by which the organization, the school in this case, prepares itself for the implementation of change in its structure and activities (Underwood and Underwood, 2008; Tyack and Cuban, 2005; Cuban, 1999). Others emphasize the teachers factor and the means by which teachers cope with the demand to change (Lacey, 2007). Still others examine the contribution of factors outside the school to the implementation of ICT-based innovations like world space radio (Venezky and Davis, 2001).

Teachers are an additional important factor in the introduction of changes in schools. Teachers’ resistance may be the result of unsuccessful previous experiences, lack of adequate rewarding, contradictory messages, fear of the unknown and pressure of different interest groups (Fullan, 2001). Therefore, researchers claim that teacher training is a vital component in the introduction of innovation and improvement in schools (Sarason, 2003). A study examining the characteristics of teacher training in ICT implementation found that, as opposed to the existing model where training occurred prior to the task and outside the school, the most efficient training was in-house and linked to the actual curriculum (Tubin and Chen, 2002).

Many researchers claim that without major change in the school structure (allocation of classes and teaching units) and in the learning processes (teaching and assessment methods) no
significant change in educational process can occur (Tyack and Cuban, 2005). Vital components of this change are organization of time and space, role distribution, communication patterns among teachers and school policy. In specific relation to world space radio, a crucial factor contributing to the promotion of the innovation is the availability of infrastructure resources: hardware, in terms of the number of radios in the school available for pupils and teachers for educational purposes, and the quality and functioning of equipment (speed of processors, OS-operating systems, peripherals and access to the radio gadgets); as well as available software, general and educational (Venezky and Davis, 2001). However, availability of world space radio alone is insufficient and must be accompanied by technical as well as pedagogical support (Pelgrum and Anderson, 1999).

Further, according to the task force on the re-alignment of the education sector to the constitution of Kenya 2010 report (2012), Open Distance Learning (ODL) approaches within which WSR fall focus on expanding access, quality and equity to education, hence could respond to the demands on education of 2010 Constitution and Vision 2030. However, is limited use of ODL approaches in primary and secondary schools in Kenya even in areas where physical, socio-economic and time factors hinder the delivery and access of education especially among pastoral and other marginalized communities.

According to the report still, some parts of the country are not covered by mainstream electronic media like WSR thereby raising issues of equity and cost in provision of education through ODL. Additionally, lack of awareness among education recipients and providers about ODL and its viability in delivering quality education creates a challenge. Limited number of skilled manpower in ODL approaches amongst the providers and inadequate infrastructure and related support for ODL in educational institutions are other challenges. Moreover, unfavourable
attitude and prejudice amongst learners of ODL coupled with evidence that ODL is not used to deliver learning and teaching in primary and secondary schools and overcrowded classrooms poses yet another major challenge. In fact according to the Kenya Education Sector Support Programme (KESSP) report (2012), classes particularly in rural areas, to which Ugenya is part of, have more than 80 pupils a class, more than the set national benchmark of 45, which suggests a lowered quality of WSR in schools.

While there have been numerous studies done on factors influencing adoption of ICT in schools (Tyack and Cuban, 2005; Venezky and Davis, 2001), there is little on factors influencing utilization of world space radio for teaching and learning. This study realizing this gap, aimed at investigating the factors.

1.2 Statement of the Problem

World space radio’s introduction to schools was based on the appreciation that quality teaching needed to take place in schools especially in the wake of free primary education that among other things created an upsurge of pupils in classrooms (Odero, 2010). However, there appears to be improper utilization of world space radio mainly due to certain factors mainly propagated by the school leadership and lack of compatible infrastructure.

There is a substantial body of literature on the potential role of new technologies in development and the fundamentals of these debates are well rehearsed (Davies, 2002; Pelgrum, 2004; Venesky and Pelgrum, 2004). Transfer of technology debates have always been polarised between techno-optimists and techno-pessimists. However, while the former certainly often underestimate the complexity of development problems, the latter equally underestimate the
flexibility of some of the technologies now available like the world space radio. Current debates on the potential role of world space radio as a component of ICT tend to be constrained by an inherent mutual lack of understanding between the technology drivers and development agencies that find it difficult to establish common ground, especially when the technology and its implications for society are changing so rapidly (Dubridge, 2004).

There is a gap that exists in studies of world space radio in Kenya. This study therefore aimed at investigating the factors that influence the use of world space radio in primary schools and particularly Ugenya district primary schools, Siaya County, Kenya.

1.3 Purpose of the Study

This study aimed to establish the factors influencing the utilization of world space radio in teaching and learning in public primary schools in Ugenya District

1.4 Objectives of the Study

The study was guided by the following objectives:

1. To determine the extent to which availability of World Space radio complementary infrastructure influences utilization of world space radio in teaching and learning in primary schools

2. To explore the extent to which teachers’ experience and preparedness influences utilization of world space radio in teaching and learning in primary schools

3. To establish the extent to which content to curriculum influences utilization of world space radio in teaching and learning in primary schools
4. To explore the extent to which teachers’ attitude influence utilization of world space radio for teaching and learning in primary schools

1.5 Research Questions

The research was guided by the following questions:

1. To what extent does the availability of World Space radio complementary infrastructure influence utilization of world space radio in teaching and learning in primary schools?
2. To what extent does teachers’ experience and preparedness influence utilization of world space radio in teaching and learning in primary schools?
3. To what extent does content to curriculum influences utilization of world space radio in teaching and learning in primary schools?
4. To what extent does teachers’ attitude influence utilization of world space radio for teaching and learning in primary schools?

1.6 Significance of the Study

The study will benefit all primary schools with an understanding of world space radio and what relevant stakeholders need to do to properly utilize the technology. It will benefit the school administration with sufficient knowledge about world space radio and its usage. The study will also be significant to pupils who are the direct beneficiaries of the technology. Besides, this study will benefit the Ministry of Education with information that would be useful in the review and innovation of policy to properly utilize all ICT factors in schools. Finally, the study will benefit fellow researchers in relevant fields to add the findings therein to their body of knowledge.
1.7 Delimitation of the Study

The study focused on the factors that influence the utilization of world space radio in teaching and learning in primary schools in Ugenya District, Siaya County, Kenya. It targeted teachers and the DEO of Ugenya District. The study was done between the months of January and July, 2013.

1.8 Limitations of the Study

The study was limited by lack of sufficient finances that would have enabled to cover the whole area of Siaya. Time was also a hindrance considering that there was limited time for carrying out this research. Finally, certain materials were difficult to locate particularly from uncooperative respondents.

1.9 Basic Assumptions of the Study

The following were the study’s basic assumptions:

1. That all primary schools in Siaya District were utilizing some form of world space radio

2. That all respondents gave credible and reliable responses to the questions relevant for the study
1.10 Operational Definition of Terms

**Availability of WSR Complimentary Infrastructure** – refers to the presence of integrated system of facilities used to provide one or more World Space Radio services like radios, Internet, network etc.

**World Space Radio**- This refers to world space satellite Radio used to create a new way for people across the world to listen to radio by 100% digital quality with an ability to be heard clearly all over the world and is used by teachers to impart knowledge to their respective learners.

**Teacher attitude**- This refers to the settled way of thinking or feeling, typically reflected in the teachers’ behavior towards utilization of World Space Radio in teaching.

**Content to Curriculum**- This refers to the substance, information and learning material found in the curriculum towards a planned interaction of pupils via WSR.

**Teacher Experience and Preparedness**- This refers to the number of years teachers have been exposed to WSR and the level of planning towards imparting knowledge, and skills to pupils through WSR.

**Utilization**- This refers to the act of using world space radio measured by the lessons where WSR is used and the extent to which it is used.
1.11 Organization of the Study

This study is organized into five chapters. Chapter one of this study introduces background of the Study, the problem statement and describes the specific problem addressed in the study. It specifically also presents the objective of the study which guides the whole scope of the study.

Chapter Two presents a review of literature and relevant research associated with the problem addressed in this study. It specifically deals with: Use of Radio in Teaching and Learning, Use of World Space Radio in Teaching and Learning and the issues inherent in the study’s objectives. It finally offers both the theoretical and conceptual frameworks.

Chapter three on its part presents the methodology and procedures used for data collection and analysis. It specifically deals with, location of the study, Research Design and all the other methodologies necessary for investigating the study problem.

Chapter four deals with data analysis, presentation, and interpretation of the findings of this study. This chapter is divided into the following sections: General characteristics of the respondents; the extent to which availability of World Space radio complementary infrastructure; the extent to which teachers’ experience and preparedness; the extent to which content to curriculum; and the extent to which teachers’ attitude influence utilization of world space radio for teaching and learning in primary schools. It also offers the correlation analysis.

Chapter five contains a summary of findings, discussions of the findings, the conclusions drawn and the recommendations made thereof. It finally offers the suggestions for further research.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on use of radio in teaching and learning, world space radio in education and development, availability of WSR complimentary infrastructure, teacher experience and preparedness, relevant of content to curriculum and teacher attitude and how they influence utilization of WSR. The chapter finally presents both the theoretical and conceptual frameworks.

2.2 Use of Radio in Teaching and Learning

Dagron, (2009) notes that educational radio is the term given to the medium's use in formal learning systems, whether primary or higher education. It is typically used as a means for course material delivery, and often integrated with various kinds of interaction: for example, in classrooms, discussion groups, or via the telephone (UNDP & UNESCO, 2004).

Radio, by nature, gives us the ability to ‘hear’ content, context, passion and pain (Dagron, 2009). Dagron further contends that radio is the most often utilised and successful medium for social change. For Kane (2008), ordinary people, not just talented leaders, can and should be agents of change (Kane, 2008); and radio is an obvious medium for catering to such change by allowing ideas to be shared and beliefs critically questioned.

According to Butcher (2003), radio has been used in education ever since it became available. Pennycuick (2008), of the Centre for International Education at the University of Sussex, states a
bit more specifically that interactive radio instruction (IRI) is characterized by “highly coordinated” instructional materials and delivery strategies, and includes elements of active participation on the part of the students. He goes on to say that IRI “is effective, is cost-effective, and teachers are enthusiastic about it” (Pennycuick, 2008, p. 24).

In support of this, the South African Institute for Distance Education (2004) stated that radio remains the key media to which most rural people have access and that educational radio initiatives in South Africa were effective in providing topical programmes and reaching large numbers of learners rapidly. Going further, they state that the impact of the radio programmes was greater when used with other text-based materials, such as posters and comics. In fact, the Department for International Development (2007) stated that their view is that radio is, for the time being, the most cost effective ICT for enhancing the quality of education in the classroom. Radio remains the most widespread and accessible ICT in Africa. In some countries it has near universal penetration. The costs of producing educational material for radio are one tenth of the costs of producing material for television, which has much lower coverage and is more expensive to access (DID, 2007).

Radio has the potential for enhancing student learning (Christen, 2008). The role of it in teaching and learning is one of the most important and widely-discussed issues in contemporary education policy (Christen, 2008; Rogers, 2004). Rogers (2004) emphasized the physical separation of teachers and learners and the use educational technology that distinguishes distance education from traditional instruction, teach-yourself programs, and independent computer-assisted instruction.
Distance learning through radio can reduce costs and increase flexibility, access, and the number of learners (Umoru-Onuka, 2002). Since distance learning relies on technology, there is also a challenge to provide service to areas and learners with limited access to technology (Siddiqui, 2007). Radio can level the playing ground for rural and disadvantaged learners. According to Domingo (2006), Radio services are credible tools in disseminating distance education. They provide access to a full range of learning and teaching materials (Mcharazo, 2006).

Umoru-Onuka (2002) observes that the use of radio is affected by their availability and ease of access. Access is affected by factors such as cost and power supply. Neal (2003) emphasizes the ability of these resources to transcend time and space, which makes asynchronous learning possible. Additionally, certain types of technologies, such as teleconferencing, enable synchronous instruction as well.

According to Nwizu (2008) the use of radio has broken the barriers of time, distance, and locale, which impeded the growth of formal education, just as Adeyemi (2004) emphasizes that students use these resource to complete major assignments.

Looking at worldview view, radio has also been extensively used in Asian countries for primary, secondary and higher education purposes as well as informal learning. Its first applications were in the Farm Radio Forums of the 1950s, which placed “radio on the educational map of Asia” (Mishra, 2005).

By comparison with Asian nations, African countries are at a more rudimentary stage of development in their educational practices, policies, and uses of educational technologies (Friends, 2009). In Africa, there is far lower TV coverage and fewer TV sets than in Asia,
decidedly less Internet access, fewer fixed telephone lines and limited computer access (Christen, 2008). Today, the most appropriate models for improving economic and social conditions in Africa are thus the earlier uses of radio in contemporary Asia and mid-19th Century Canada. Insights into how the models of radio for DE and community radio in Asia have been creatively applied in Africa can be gained from examples of interactive radio instruction (IRI) in Kenya and Mali (Dock & Helwig, 2009).

IRI was first used in Africa in the ‘80s, to develop a Radio Language Arts (RLA) programme in Kenya for first to third grades (Moulton, 2004; Dock & Helwig, 2009). The IRI lessons were very structured, with timed pauses for chorused replies from the class. They also incorporated time for individual questions and comments. The RLA programme relied extensively on stories, games and songs, and engaged the students in learning by stimulating their fantasies. The basic structure of the lessons was that of a conversation. The IRI approach has since been equally useful in approximately 20 developing countries in Africa, Asia, and South America (Dock & Helwig, 2009).

It is largely used to improve the quality of education when teacher training is low or when there is a teacher shortage. Lessons are transmitted by an initial teacher via radio or audio cassettes to classrooms where a supplementary teacher manages the student exercises, class discussion, and follow-up (Bosch, 2007). Exercises and interactive activities are scheduled during pauses in the audio programme. Bosch (2007) showed that IRI can increase learning and improve test scores, and is useful in bringing rural children up to the level of those in urban schools who have access to better teachers and materials. Bosch (2004) has stated that, since the early 1980s, the
sustainable success rate for IRI projects has been 66 per cent. This is quite exceptional given the common challenges encountered by DE initiatives in developing countries.

Thomas (2001) states that in many areas of the world, radio is still the only medium through which educators can reach a mass audience, simultaneously and at relatively low cost. Dagron (2009) adds that it is not only an important mechanism for the diffusion of development information in local languages and over widespread and remote geographical areas; it is also a great tool for reinforcing and strengthening cultural expressions and identities. Radio alone will not solve the problems of educational delivery to remote, rural people in the developing world. As Baggaley and Ng (2005) have indicated, there is no single formula for DE in developing countries. Empowerment of ministries of education, higher educational priorities, improved teacher training, the implementation of sustainable programmes, and particular attention to the needs of rural areas, are all necessary steps to this end. Yet radio, if used effectively, can be a powerfully motivating and low-cost educational technology capable of sustaining the oral tradition of indigenous people and cultures (Christen, 2008). The medium reaches large numbers of people, and allows learners to remain in their own home settings without having to relocate for schooling (Friends, 2009). It can also protect the heritage of minority languages; and it is accessible to illiterate people (Dock & Helwig, 2009).

In Kenya broadcasts to schools started in 1963 when the school broadcasting Division of the then Ministry of Education was established. It was later expanded in 1976 and moved to Kenya Institute of Education and was renamed Educational Media Service (EMS). whose responsibility was to produce and broadcasts educational materials to schools through what was then the voice
of Kenya (VOK). The EMS was subsequently absorbed into the Kenya Institute of Education (KIE that year (KIE, 2005).

The broadcasts to schools continued through VOK (which later became KBC in 1989) up to 1995, when they ceased due to lack of funds following commercialisation of KBC (Ministry of Education, Science and technology, 2005). The EMS continued producing programmes in house for selling to schools or individuals. Then the Koech Commission of 1999 recommended that the ministry of education collaborate with the Ministry of information and broadcasting and the other media houses for allocation of airtime to promote alternative and continuing education. As a result, the broadcasts to schools resumed in 2002 through the World Space radio system (KIE, 2005) and secondary schools were expected to use the programmes in teaching and learning.

By 2006, the schools broadcast audience through World Space radio was quite low (KIE, 2005, Nyakiti, 2006), perhaps due to the combined effect of the complexity of the system and the high subscription fee involved. With the launching of free primary education in (2003), a government task force in the Ministry of Education Science &Technology, (2003) recommended expansion and strengthening of the school broadcasts in the wake of high enrolments in primary schools. In January 2007, a world Bank funded initiative enabled the resumption of the schools broadcasts through KBC AM and FM English service transmissions (Odera, 2010).

Radio has its drawbacks, of course. In its original form, it is essentially a one-way communication medium whereby interaction with listeners is minimal. As a result, a radio programme's pace is primarily that of the broadcaster, who can find it difficult to gauge the listeners' prior knowledge and attitudes critical to learning. To compensate for these drawbacks, radio presentations can be packaged with visual and print materials; interactive elements can be
organised via listening groups and tutorial classes; and radio cassettes can be used to minimise scheduling problems (Dagron, 2009).

2.3 World Space Radio in Education and Development

World space satellite radio was envisioned created by Noah Samara in 1990. His goal was to create a new form of electronic media using satellite to broadcast directly to people across the globe. It is based upon the proprietary World Space satellite technology, content programming and content delivery method (Friend, 2009).

The year 2003 saw World Space Radio adopting new consumer media in Africa. It brought about satellite radio to the world, created satellite radio Boom boxes and portable receivers from Hitachi, Panasonic, JVC and others (Christen, 2008; Fermich, 2007). World Space Radio also delivers multimedia education, video, audio, PowerPoint, website and email via a satellite radio to computers without the need phone or cable connectivity (Heinich et al, 2002). It is currently being used by military around the world to bring troops their favourite music and stations wherever they are stationed.

The World Space Radio digital satellite signal means no fading, noise or interference. The system delivers crystal clear digital quality sound in a coverage area of 14 million square Kilometres. As long as you are in line of sight with the satellite, you will never use the World Space Radio high quality sound (Odero, 2010).

One can listen to regional dance music, Jazz, pop, country or classical music. One can hear news, financial information, and even weather reports. In Africa World Space Radio offers programming not just in English, French and German but Hindu, Urdu, and Swahili too. In Asia,
languages include English or French, Japanese, Tamil and Malayalan. The aim of World Space Radio is to broadcast on the African learning channel that is reaching an actual audience of six million people with education and information on critical subjects such as HIV/AIDS along with structured programme for women on Micro-enterprise (Odero, 2010; Fullan, 2001).

Further according to Odero (2010) after school hours, in the afternoon, World Space Radio receivers are used to deliver audio-drama, entertainment and education to adults and professionals. The radio lessons are accompanied by printed material sent out to schools in advance in order for the students and teachers to know the time and date of the lesson and teachers also get notes on how to use the radio lesson.

When speaking about world space in teaching and learning Kozma (2000) says that WorldSpace, with its extensive reach and low-cost terminals, offers a viable solution to increase the access to global educational resources. This solution includes audio formats, asynchronous multimedia delivery and creation of virtual classrooms with instructor-led, synchronous delivery of audio-visual presentations. These help enhance the quality of education delivery across Africa and Asia.

Education is paramount to better societies and more fulfilling lives. Unfortunately, millions of young people - particularly in remote regions of Africa and Asia - are out of school due to a shortage of qualified teachers and inadequate learning material (Friends, 2009). Providing quality education in rural territories has traditionally been a difficult and expensive endeavor. Today, however, world space radio can move us closer to realizing the vision of ubiquitous education (Friends, 2009; Dubridge, 2004; Feimich, 2007).
However, there are certain challenges. The findings of an UNICEF-funded study undertaken by WorldSpace for Southern Sudan in the summer of 2005 are representative of the key issues facing the Education sector in underdeveloped areas. They include: 1) Insufficient number of trained teachers. 2) Insufficient number of teacher training centres and faculty. 3) Insufficient learning materials in schools. 4) No facility to access study or teaching materials. 5) No electrical communication system. 6) Gross gender disparity in school enrolment and completion.

But still as Feimich (2007) argues, the human voice bears a personal touch to the learning experience. Students enjoy and benefit from live presentations by good teachers, with the extemporaneous delivery, intonation, phrasing and pacing. Hence, WorldSpace system, which provides digital audio with fade-free, noise-free reception across vast territories, can be leveraged for distance education.

For example, WorldSpace has dedicated one channel on its AfriStar™ satellite to broadcast education to 11 million children in Kenya's 18,617 primary and 3,245 secondary schools (Christen, 2008). According to the Government of Kenya, neither contracting with the local individual broadcasters, nor investing in a terrestrial broadcast channel proved as valuable as the complete and cost-effective package for instructional broadcasting and information dissemination offered by WorldSpace (GOK, 2007).

2.4 Availability of WSR complementing infrastructure and its influence on WSR utilization

Resource support in terms of human, material, and financial has been considered indispensable in determining the successful implementation of an innovation (Carless, 2009; Li, 2008). Fullan and Miles (2002) asserted that change demands additional resources for training, for substitutes,
for new materials, for new space, and, above all, for time. Change is “resource-hungry” because of what it represents—developing solutions to complex problems, learning new skills, arriving at new insights, all carried out in a social setting already overloaded with demands. Such serious personal and collective development necessarily demands resources. (p. 750)

Carless (2009) considered innovation complementing infrastructure a crucial resource in the promotion of innovation. He claimed that complementing infrastructure can help minimize the extra workload associated with innovation, and in particular can provide vital support for untrained and inexperienced teachers who have weak subject knowledge.

Berman and McLaughlin (2004) found that a significant level of complementing infrastructure support was important, and that innovations attempted would not have been 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) reveals that one fundamental problem facing ICT Policy implementation and integration in schools is 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) reveals that teachers agreed that access to WSR complementing infrastructure like network boosters, power and radio themselves, like any other ICT infrastructure is one of the effective means to integrate WSR in classrooms. As earlier reviewed, WSR is increasingly being used to
improve access to education and employment opportunities (Christen, 2008; Friends, 2009). WSR has the potential to improve young peoples’ access to educational opportunities as well as to enhance the quality of that education through the new modes of learning. Through WSR, curricula can be more easily updated, adapted, enriched and personalized to satisfy a broad range of learning needs (Feimich, 2007). And as such need complementing infrastructure to improve its further utilization.

2.5 Teacher Experience and Preparedness and Utilization of radio programme

From experience, teaching with any medium requires careful planning. If world space radio programmes are to be used effectively the teachers’ role must be spelt out clearly. Proper utilization of radio programmes in the classroom involves many things. Some of these requirements are based on teachers’ attitude and others depend on the classroom environment, weather condition, the number of students in the class and the availability of media resources (Odero, 2010; Christen, 2008).

To make effective use of radio programmes teachers need to encourage the students by motivating them to learn effectively from radio programmes. They need to help students to benefit from listening to radio broadcasts. The quality of the programmes also contributes to their effectiveness in meeting the learning need of the students. Experience and studies (Venezky and davies, 2001; Fullan, 2001) reveals that the role of teacher is very important in the effective utilisation of radio programmes. The classroom needs to be organized to provide the optimum conditions for listening. Teachers in Kenya have been advised about the problems of unorganised classes during broadcasts. This creates confusion and should be avoided.
The presence of the teacher in the class during broadcasts is also important. Taking part in the listening process with the students motivates them. For instance, it enables the teacher to identify those with hearing difficulties so as to sit them near the radio. The teacher can also encourage the students to respond to radio presenters (Tyack and Cuban, 2009). Being in the class with a student helps to maintain classroom discipline during broadcasts. Effective preparation for using radio lessons will of course vary according to the subject, the nature of the programme, and the level of the class. But the listening situation should be pleasant, comfortable and orderly. Teachers should refer to students’ experience relating to the subject of the broadcast, to add to what is covered by the radio (Fullan, 2001).

To be able to use the programmes effectively, teachers in Kenya have guide notes to refer to before the broadcast. However, if World Space Radio programmes are seen as an integral part of the whole learning situation contributing to its success, then teachers needs support to perform this role effectively (Anzolena, 2008). By using the appropriate materials, skills and classroom techniques. Radio programmes can be used efficiently and easily by both teacher and learner.

2.6 Relevance of Content to WSR Curriculum and Utilization of Radio Programme

National ICT policies have reached an established position in both developed and developing countries. A study funded by the Australian Department of Education, Science and Training revealed that most national ICT policies focus on the educational sector (Kearns & Grant, 2002). Education is put forward as the central actor to pursue and attain the objectives of the ICT policy; other sectors are expected to benefit indirectly from this approach. Educational ICT policies have been designed in a variety of ways, depending on the dominant rationales that drive curriculum development. As early as 15 years ago, Hawkridge (1990) discerned four different
rationales that drive content policies related to the integration of ICT with all its forms like the WSR and their use in education: an economic rationale: the development of ICT skills is necessary to meet the need for a skilled workforce, as learning is related to future jobs and careers; a social rationale: this builds on the belief that all pupils should know about and be familiar with the ICT gadgets like computers, radio, television in order to become responsible and well-informed citizens; an educational rationale: ICT is seen as a supportive tool to improve teaching and learning; a catalytic rationale: ICT is expected to accelerate educational innovations.

Current content for curriculum developments mainly reflect an economic and social rationale (Fullan, 2001). National policies identify ICT literacy as a set of competencies needed to participate in society (OECD/CERI, 2001). The eEurope 2002 objectives of the Lisbon Summit stipulate that all school-leavers must be digitally literate in order to be prepared for a knowledge-based economy (Commission of the European Communities, 2000). In the light of the socioeconomic rationale, many countries have introduced ICT as a separate school subject in order to teach pupils a number of technical ICT skills (Plomp, Anderson, Law & Quale, 2003).

National ICT curricula and frameworks, eg, the Qualification and Curriculum Authority/Department for Education and Employment (1999) and Alberta Learning (2009) stress the educational rationale. This approach builds on the assumption that the use of ICT and WSR is beneficial for student learning. ICT literacy is—according to this rationale—a secondary effect of a content-related ICT use. The educational use of WSR should be embedded within subject-oriented competencies (Plomp et al, 2003). Hawkridge (2009) also stresses the educational innovation potential of WSR use and therefore argues that whatever content used in its
curriculum will spur qualitative utilization of WSR for the betterment of the Pupils. Such qualitative and educationally oriented content according to Tyack and Cuban (2005) helps to pursue higher-order thinking and problem-solving skills. It is believed that learning to solve problems, developing research skills and studying problems of personal interest are the key to a successful educational content (Zuga, 2008).

Educational policies in developing countries are characterised by a high level of local school autonomy (Hawkridge & Robinson, 2002). Schools are autonomous and are accountable for organising the content of teaching and learning processes. They are also responsible for setting up their quality control policies in order to prove that they meet the attainment targets (standards) put forward by the government (Hawkridge & Robinson, 2002). Kinsler and Gamble (2002) argued that this has often created a major problem as the content for WSR curriculum has often been irrelevant that it has often hindered the proper utilization of WSR in teaching and learning.

Christen (2008) however, argues that quality content for WSR curriculum must be tailor made to suit the peculiar needs of the learners for it to be relevant and spur useful utilization of WSR. As a result, content though autonomous to the whims of local schools can be well crafted to offer quality learning and teaching using WSR.

In 2000, a radio curriculum for the adult component of the Interactive Radio Instruction (IRI) was developed, based on which 13 episodes of radio programmes were produced. All the episodes were aimed at motivating the learners to embark on social action activities and were broadcast to the radio listening groups. The success of the adult component of the IRI programme led to the launch of a school-based programme, which is currently being piloted using the model from the Opening Learning Systems Education Trust (OLSET) in South Africa (Dagron, 2009).
So far according to Dagron, (2009) the content is considered relevant that it has spurred high utilization of WSR in schools.

Kozma (2000) in speaking about content in curriculum of WSR said that an organization of learning should be included— this category includes the two factors comprising the main component of the school’s organizational structure (Tyack and Cuban, 2005): the layout of the learning units (lessons, fixed time units, activity hours) and the allocation of students into learning groups (single-aged, multi-aged, according to fields of interest, content, etc.). The scale is determined by the extent of flexibility, mobility or rigidity in the school’s timetable.

2.7 Teachers Attitude about the Use of radio in teaching and learning

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 has helped to improve their classroom presentation and helped them tackle difficult topics. About 89% gave positive response about using radio to improve teaching methods.

Improving students learning: Most of the participants reported examples of students learning from radio programmes. A Kiswahili teacher reported that using radio helped to improve Kiswahili language. When she came to this school, the girls were not speaking in Kiswahili language because they did not know, but since they started using radio programmes they could now express themselves in Kiswahili.
Further, from her study, 63% believed that radio helps to widen access to education, because information from radio reaches everyone who listen to it. A high proportion of teachers agreed that using radio programmes helps to introduce new ideas and improve their own teaching qualification, cost benefits. The majority of participants 67% believed that it is more cost effective to use the radio and cassette recorders in teaching them conventional methods of teaching thus recommending investment in radio technology as suitable for distance learning. Teachers believed that radio is useful for curriculum innovation and economically because one person can teach the whole nation the same thing at the same time.

The views of teachers regarding broadcasts learning by expressing their views concerning improving learning, motivating learners, widening access, extending knowledge, improving listening skills and extending learning opportunities (Odera, 2010; Pelgrum, 2004).

Similarly, teacher’s comments about the effects of school radio programmes on students learning was very positive. The participants reported that their students were able to discuss with the teachers and even among themselves about the content of the radio programmes that they listen to.

With regard to problems affecting effective use of audio programme, the result of Anzolena (2008) showed that teachers rated the factors that they felt the use of radio in teaching /learning. Some of them said that they were not able to use live broadcast due to transmission breakdown and lack of adequate time. However, the overall funding of this investigation revealed that 30% had no problem but 70% reported having problem with fitting timetable with the rest of the subjects.
Further, the scope and mode of using radio in the school relies 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 are used in the school. This is made more poignant as teachers schemes of work include radio programmes, teachers incorporate radio programmes in their lesson preparation, some teachers are appointed to be in charge of all media materials and broadcasts programme in the school (Anzolena, 2008; MOE, 2006).

Teachers who do not have positive expectations for WSR use or do not instill or support a culture of technology use; integration is inhibited (Anderson & Dexter, 2000). Therefore, teachers should have knowledge, skill and positive attitudes towards implementing WSR in schools and also they must know new administrative techniques to manage their schools effectively (Tyack & Cuban, 2005).

In line with this idea, Thomas (2001) stated that teachers should understand (a) the elements and characteristics of long-range planning for the use of current and emerging technology; (b) demonstrate an ability to analyze and react to technology issues, concepts and proposals; (c) possess a “big-picture” vision of technology in education and schools; (d) use technology to communicate efficiently with staff, parents and the community; (e) use technology directly to collect and analyze data and other information that can improve decision-making and other management functions; (f) understand how current and available technologies like WSR can be integrated effectively into all aspects of the teaching and learning process; (g) understand the legal and ethical issues related to technology licensing and usage; and (h) use technology appropriately in leading and communicating about school programs and activities.
2.8 Theoretical Framework

This study was embedded in the Open Systems Theory as espoused by Kast and Rosenzweig (1985). The theory is one which continuously interacts with its environment. The interaction can take the form of information, energy, or material transfers into or out of the system boundary, depending on the discipline which defines the concept.

The incorporation of world space radio as a technological tool into the day-to-day functions of educational institutions has a marked impact on every aspect of management structure and dynamics (Bosch, 2004). It means the study on WSR introduction in the schools would not have been exhaustive if the social and technical aspects were not considered in their entirety explaining the reason for the adoption of the socio-technical approach in this study which has its basis on the Kenyan ICT Policy and its implementation exercise in primary schools (Bosch, 2007).

In the open systems theory, the school is viewed as an open socio-technical system composed of five (5) major, partly overlapping and interdependent sub-systems namely: managerial, structural, psychosocial, goals and values, and technical (Bosch, 2007; Dubridge, 2004). The school’s five sub-systems interact with the external environment in such a manner that bringing change in one would necessarily lead to changes in all the others. Therefore, when considering the introduction of innovations in schools, it is prudent to take cognizance of the interdependencies and interactions first between the five sub-systems and secondly with the external environment (Cuban, 1999). As stated earlier, this was chosen to guide this study due to its all encompassing nature to get the total picture of the factors that influence use of WSR in schools, as this avoids an overemphasis of some elements over others.
2.9 Conceptual Framework

The conceptual framework offers the link between the independent variables and the dependent variable. It further shows the connection between the two main variables and both the moderating and intervening variables.

**Independent Variables**

- Availability of WSR Complementing Infrastructure
  - Radio
  - Power
  - Network Boosters
- Teachers’ Experience and Preparedness
  - Proficiency
  - Duration of WSR lesson
  - Teaching Methodology
- Relevance of Content to School Curriculum
  - School Syllabus
  - WSR Content
- Teachers’ Attitude Towards WSR Utilization
  - Perceived benefits
  - General feeling about WSR

**Moderating Variable**

- Government Policy

**Dependent Variable**

- Utilization of World Space Radio in Teaching and Learning
  - Audibility
  - Disruptions
  - Network Strength

**Intervening Variables**

- Attitude of Head Teacher
- Culture of the School

*Figure 1 Conceptual Framework*
The conceptual framework assumes a relationship between the independent variables and the dependent variable. It specifically assumes that the level of availability of WSR complementing infrastructure, teachers’ experience and preparedness, relevance of WSR content to school curriculum and teachers attitude towards WSR utilization, which are the independent variables, play either a positive or negative role in influencing utilization of World Space radio in teaching and learning in primary schools, which is the study’s dependent variable. However, even in the relationship between the two levels of variable, there are intervening variables, namely; attitude of head teacher and culture of the school, which, though not the main variables, also play a part in influencing the link between the independent variables and the dependent variable and so is the government ICT policy as a moderating variable.

2.10 Summary and Research Gaps

The literature reviewed has touched on use of radio in teaching and learning, world space radio in education and development, availability of WSR complimentary infrastructure, teacher experience and preparedness, relevant of content to curriculum and teacher attitude and how they influence utilization of WSR. However certain gaps exist. Firstly, much of the reviewed literature handling ICT complementary infrastructure is based on computers and very few talk of WSR. Secondly, the use of radio for instructional purposes has a long history, yet the number of studies directed toward the development and improvement of instructional techniques and content appropriate for radio is relatively small. Teachers experience, preparedness and attitude discussed are more computer and internet oriented and little on WSR particularly considering rural areas that need WSR in teaching and learning.
CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter puts into focus the methodology that will be used. It carries with it the research design, target population, sampling technique and sampling size, the data collection methods and the data analysis.

3.2 Location of Study

Ugenya District is part of Nyanza Province in Western Kenya. It is bordered by Busia District to the North, Vihiga and Butere-Mumias Districts to the North-East, Bondo District to the South, and Kisumu District to the South-East, and has a total area of approximately 520 square km. Ugenya has approximately 342,000 people who live there. The region is densely populated (132 people per square kilometer). Further the district depends upon a largely agricultural economy. The people are engaged mainly in subsistence farming, livestock keeping, fishing, rice farming and small scale trading. The district has over 80 primary schools, a significant of them employing some form of WSR in their teaching and learning thus the reason for this study.

3.3 Research Design

The study adopted a descriptive survey research design. Surveys are used to systematically gather factual quantifiable information necessary for decision making. Kothari (2004) observes that surveys are an efficient method of collecting descriptive data regarding the characteristics of populations, current practices and conditions or needs. Surveys also gather information from relatively large cases by use of samples hence cutting down on costs. Descriptive survey is a
method of collecting information by interviewing or administering a questionnaire to a sample of individuals (Berg 2005). Descriptive research design is useful as it studies on variables that are happening or already have happened and which the researcher has no control over (Kothari, 2004)

This study employed both quantitative and qualitative research methods. Kothari (2004) says that in using both methods, a study assumes a complete outlook thus offering comprehensive findings necessary for any important research study. The fact that descriptive survey research design was used also makes it possible to employ both methodologies (Berg, 2005).

3.4 Target Population

The target population comprised of the 3500 teachers of the schools and the district DEO. This brought the total population to 3501 respondents.

3.5 Sampling Techniques and Sample Size

Kerlinger (1975) argued that the main factor considered in determining the sample size is the need to keep it manageable enough. This will enable the researcher to derive from it detailed data at an affordable cost in terms of time, finances and human resource (Mugenda & Mugenda, 1999). Sampling error arise from two factors in research study of this kind; the sample size and the amount of diversity in the sample (Berg, 2005), which are taken into account under sample size determination and sampling procedure in this study. Sample size is a small proportion of target population selected for analysis.

The study employed both simple random sampling and purposive sampling. The Kathuri and Pals (2006) sample size table (see Appendix 6) was used to select 346 teachers of primary schools in Ugenya District. This type of sampling provides a representative sample which has no
bias. The method ensured that each member of the target population had an equal and independent chance of being included in the sample. The study further employed purposive sampling technique to select the DEO. A total number of 347 respondents were involved in the study.

3.6 Data Collection Instruments

The study used questionnaires and interview schedule for data collection. Questionnaires were designed to obtain details on views, problems and challenges affecting use of WSR. Interviews was used to collect qualitative data from the DEO to enrich information provided in the questionnaires.

3.6.1 Questionnaire

This instrument is appropriate due to its ability to allow the respondent to express feelings accordingly, it has the following advantages:-Respondents have adequate time to give well thought out answers, It is free from the bias of the questioner, answers are in respondents own words, respondents who are not easily approachable can also be reached conveniently and a large sample can be made use of and thus the results can be made dependable and reliable (Kothari, 2004). Questionnaires were used on the teachers.

The questionnaire was in likert scale with respondents being asked questions to which they answered either strongly agree to strongly disagree. They were asked questions touching on the extent of availability of WSR complimentary infrastructure and its influence on WSR utilization, relevance of content to curriculum, teacher experience and preparedness together with teachers attitude and their influence on WSR utilization in teaching and learning.
3.6.2 Interview Schedule

An interview schedule was administered to the DEO. The interviews sought to clarify issues of world space radio usage. Interviews are appropriate because respondents are given chance to discuss their ideas freely. Clarification can be sought and persuasion can be employed on areas that look sensitive (Trop 2006).

3.7 Reliability of Research Instruments

Reliability of research instruments refers to the ability to replicate the same study (Mugenda & Mugenda, 1999). Reliability for this study, a pilot study was done in neighboring Siaya District on 35 teachers (10% of sample size) then split half method was done because it had a major advantage of eliminating chance error caused due to differing test conditions. Scores on the odd numbered items from the piloted instruments were correlated with the scores on the even numbered items and its figure stood at 0.714. Any Score above 0.7 is acceptable according to Kothari (2004). Thus the reliability of the study was ascertained and based on the score accepted.

3.8 Validity of Research Instruments

According to Mugenda and Mugenda, (1999) validity refers to the accuracy and meaningfulness of inferences, which are based on the research results. It is the degree to which results obtained from the analysis of the actual data that represent the phenomenon under study. Berg (2005) argued that the instrument should be given to an individual who can be expected to render an intelligent judgment about the adequacy of the instrument. To test for content validity the instruments were scrutinized by two experts of distance education who then guided the researcher on the acceptable, valid instruments.
3.9 Data Analysis

The data collected was edited, coded, analyzed and summarized. Descriptive statistics particularly the frequencies and percentages were applied in analyzing the data. The data was presented using frequency tables. Statistics Package for Social Science (SPSS) software version 19 was used to aid in the data analysis. Pearson correlation analysis to test the relationship between the independent and dependent variables was also used to analyze data.

3.10 Ethical Consideration

Berg (2005) highlights ethical concerns that ought to be adhered to before embarking on research. The same principle was adhered to by this study. The principles were, getting consent from all respondents before handing over the questionnaire or interview schedules. The identity of people from whom information was obtained in the course of the study was kept strictly confidential. The nature and purpose of the research was explained to the respondents by the researcher. The participants were assured of anonymity; and their ability to withdraw from the study at will, was also assured.
3.11 Operational Definition of Variables

The table presents the operational definition of variables based on both the independent and dependent variables. The table is divided into the objectives, the actual variables, the measurements for getting scores from the objectives, the data collection tools, the measuring scales, types of analysis and the tool of analysis.

Table 3.1 Operationalization Organization of Variables

<table>
<thead>
<tr>
<th>Objective</th>
<th>Variables</th>
<th>Measurements</th>
<th>Data Collection Tool</th>
<th>Measuring Scale</th>
<th>Type of Analysis</th>
<th>Tool of Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Extent to which availability of World Space Complimentary infrastructure influence on WSR utilization</td>
<td>Infrastructure</td>
<td>• Availability of Radio</td>
<td>Questionnaires</td>
<td>Nominal, ordinal, interval and ratio Scales</td>
<td>Descriptive Analysis in form of counts and percentages</td>
<td>SPSS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Availability of peripherals ie networks</td>
<td>Interview Schedule</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Power</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Extent to which teacher experience and preparedness influence use of world space radio in primary schools</td>
<td>Experience and Attitude</td>
<td>• Proficiency teaching methodology</td>
<td>Questionnaires</td>
<td>Nominal, ordinal, interval and ratio Scales</td>
<td>Descriptive Analysis in form of counts and percentages</td>
<td>SPSS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Duration of WSR lessons</td>
<td>Interview Schedule</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Extent to which relevance of content to curriculum influence use of world space radio in primary schools</td>
<td>Content</td>
<td>• WSR syllabus</td>
<td>Questionnaires</td>
<td>Nominal, ordinal, interval and ratio Scales</td>
<td>Descriptive Analysis in form of counts and percentages</td>
<td>SPSS</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• WSR content</td>
<td>Interview Schedule</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 3.12. Summary

This chapter part presented the methodology and procedures used for data collection and analysis. It specifically dealt with, location of the study which was at Ugenya District public primary schools, Research Design which was descriptive survey design, the target population that had 3500 teachers who were later sampled to 346 using Kathuri and Pals (2006) sample size calculation table and data collected using questionnaires and interview schedule. Reliability was tested using split half method while validity was calculated using experts in the field. Data was then analyzed using descriptive statistics and Pearson correlations and presented in tables.
CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

This chapter deals with data analysis, presentation and interpretation of the findings of this study. This chapter is divided into the following sections: General characteristics of the respondents; the extent to which availability of World Space radio complementary infrastructure influences utilization of world space radio in teaching and learning in primary schools; the extent to which teachers’ experience and preparedness influences utilization of world space radio in teaching and learning in primary schools; the extent to which content to curriculum influences utilization of world space radio in teaching and learning in primary schools; and the extent to which teachers’ attitude influence utilization of world space radio for teaching and learning in primary schools. It also offers the correlation analysis.

4.2 Response Rate

All the targeted respondents, 346 of the teachers gave their responses in all questions asked. This means that the study had a 100% response rate.

4.3 General characteristics of the Respondents

The study was informed by teaching staff who are critical in determining the factors influencing the utilization of world space radio in teaching and learning in public primary schools in Ugenya District. There were 346 respondents comprising of teaching staff. Respondents were asked to give general information regarding their background.
4.3.1 Gender and Age Distribution of Respondents

The respondents were asked to give their gender and age distribution. The response is as seen in Table 4.1.

<table>
<thead>
<tr>
<th>Gender of Respondents</th>
<th>Age of Respondents</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20-29 years</td>
<td>30-39 years</td>
</tr>
<tr>
<td>Male</td>
<td>Count</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>% within Age of Respondents</td>
<td>26.2%</td>
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<tr>
<td></td>
<td>% of Total</td>
<td>9.5%</td>
</tr>
<tr>
<td>Female</td>
<td>Count</td>
<td>93</td>
</tr>
<tr>
<td></td>
<td>% within Age of Respondents</td>
<td>73.8%</td>
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<tr>
<td></td>
<td>% of Total</td>
<td>26.9%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>126</td>
</tr>
<tr>
<td></td>
<td>% within Age of Respondents</td>
<td>100.0%</td>
</tr>
<tr>
<td></td>
<td>% of Total</td>
<td>36.4%</td>
</tr>
</tbody>
</table>

From Table 4.1 it is clear that majority of teachers at 61.0% were female while only 39.0% were male. This implies that the teaching profession at Ugenya District was female dominated. This further implies the teaching profession at primary school level in East Africa and particularly in Kenya was female dominated, partly because females are thought to endear themselves better to young pupils because of their innate motherly instincts.

On age, majority of respondents at 48.6% were aged between 30-39 years, followed by 36.4% between 20-29 years, 11.2% between 40-49 years and finally only 3.5% were aged over 50.
years. This is an indication that majority of respondents were adequately exposed to issues of World Space Radio, having created the impression from their ages that they were mature enough to comprehend the issues involved in factors affecting utilization of WSR and its influence on teaching and learning.

4.3.2 Type of School

The respondents were asked to give information about the type of school from which they taught. The result is as seen in Table 4.2.

<table>
<thead>
<tr>
<th>Type of School</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>192</td>
<td>55.5</td>
</tr>
<tr>
<td>Day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boarding</td>
<td>126</td>
<td>36.4</td>
</tr>
<tr>
<td>Day/Boarding</td>
<td>28</td>
<td>8.1</td>
</tr>
<tr>
<td>Total</td>
<td>346</td>
<td>100.0</td>
</tr>
</tbody>
</table>

It is clear that from Table 4.2, more than half at 55.5% taught at Day primary schools followed by 36.4% taught at boarding schools and only 9.1% taught at Day/Boarding school. This implies that most primary schools were day schools. This result further indicates that the study got responses from a cross-section of available types of schools further strengthening the credibility of its findings.

4.3.3 Setting of Schools

The respondents were asked to give information about the setting of school from which they taught. The result is as seen in Table 4.3.
Table 4.3 Setting of School

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>21</td>
<td>6.1</td>
</tr>
<tr>
<td>Semi-Urban</td>
<td>56</td>
<td>16.2</td>
</tr>
<tr>
<td>Rural</td>
<td>269</td>
<td>77.7</td>
</tr>
<tr>
<td>Total</td>
<td>346</td>
<td>100.0</td>
</tr>
</tbody>
</table>

From Table 4.3 it is clear that 77.7% of respondents taught in rural schools and only 16.2% and 6.1% taught at semi-urban and urban schools respectively. This implies that schools in Ugenya were set in the rural areas a factor that is important having contented that WSR is predominantly utilized in rural schools.

4.4 Availability of WSR Complementing Infrastructure

The first objective sought to determine the extent to which availability of World Space radio complementary infrastructure influences utilization of world space radio in teaching and learning in primary schools. The results are as shown in tables 4.4, 4.5, 4.6 and 4.7.

Table 4.4 Availability of WSR Programme

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>267</td>
<td>77.2</td>
</tr>
<tr>
<td>No</td>
<td>79</td>
<td>22.8</td>
</tr>
<tr>
<td>Total</td>
<td>346</td>
<td>100.0</td>
</tr>
</tbody>
</table>

From Table 4.4 it is clear that majority at 77.2% said that yes, there was a WSR programme in their school. Only 22.8% said that there was no such programme. This implies that most schools had a WSR programme.
4.4.1 Availability of WSR Compatible Infrastructure

The respondents were then asked if they had WSR compatible infrastructure. This was necessary to ascertain if after saying that they had WSR programme, that information conformed with availability of WSR compatible infrastructure. The result is a seen in Table 4.5.

Table 4.5 Availability of WSR Compatible Infrastructure

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Yes</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>245</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>346</td>
</tr>
</tbody>
</table>

From Table 4.5 it is evidently clear that 70.8% said that the schools did not completely have WSR Complementing infrastructure. This implies that schools, while they had a WSR programme, such a programme was hindered by lack of WSR complementing infrastructure.

4.4.2 Subjects WSR is used to Teach

The respondents were asked to offer the subjects WSR was used to teach. The response is as seen in Table 4.6.

Table 4.6 Subjects WSR is used to Teach

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td>Mathematics</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>Sciences</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Arts</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>Languages</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>All of Above</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>None of the Above</td>
<td>25</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>346</td>
</tr>
</tbody>
</table>
From Table 4.6 the results show that 34.1% of respondents used WSR for teaching Art subjects, 23.1% used it for languages, 15.3% used it for Mathematics, 10.7% used it for sciences, 9.5% used it for all of the selected subjects and 7.2% said they used it for none of the selected subjects. This implies that WSR was mainly used for art subjects. It should be noted however, judging from the result, that WSR was not uniformly used across the subjects examined in primary schools. Such narrow usage ultimately hinders WSR utilization for teaching and learning.

4.4.3 Challenge of Power Outage

It should be noted that power outages is considered an aspect that hinders WSR use. To ascertain if that was true, the respondents were asked about it and their results is as seen in Table 4.7.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid Yes</td>
<td>295</td>
<td>85.3</td>
</tr>
<tr>
<td>No</td>
<td>51</td>
<td>14.7</td>
</tr>
<tr>
<td>Total</td>
<td>346</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4.7 shows that majority at 85.3% agreed with the assertion that power outages was a constant challenge in the effective utilization of WSR in teaching and learning. Only 14.7% disagreed. Power outages particularly in the rural areas is a factor that has often hindered WSR according to the DEO in an interview done by the researcher. Such outages had often made it very difficult to use WSR effectively.
4.5 Influence of teachers’ experience and preparedness on WSR in teaching and Learning

The second objective sought to explore the extent to which teachers’ experience and preparedness influences utilization of world space radio in teaching and learning in primary schools. The results are shown in Table 4.8.
<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th></th>
<th>Undecided</th>
<th></th>
<th>Disagree</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
</tr>
<tr>
<td>World Space radio needs proper experience for highly effective teaching and learning</td>
<td>200</td>
<td>57.8%</td>
<td>30</td>
<td>8.7%</td>
<td>116</td>
<td>33.5%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>129</td>
<td>37.3%</td>
<td>13</td>
<td>3.8%</td>
<td>204</td>
<td>59.0%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>As a teacher, I have the requisite experience to enhance utilization of WSR for teaching and Learning</td>
<td>125</td>
<td>36.1%</td>
<td>14</td>
<td>4.0%</td>
<td>207</td>
<td>59.8%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>My long experience in use of WSR has improved utilization of WSR</td>
<td>120</td>
<td>34.7%</td>
<td>18</td>
<td>5.2%</td>
<td>208</td>
<td>60.1%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>I am adequately proficient in the use of WSR</td>
<td>129</td>
<td>37.3%</td>
<td>14</td>
<td>4.0%</td>
<td>203</td>
<td>58.7%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>We use WSR frequently at least once a week</td>
<td>124</td>
<td>35.8%</td>
<td>10</td>
<td>2.9%</td>
<td>212</td>
<td>61.3%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>Our teaching methodology when using WSR is inclusive and highly efficient in teaching and learning</td>
<td>114</td>
<td>32.9%</td>
<td>18</td>
<td>5.2%</td>
<td>214</td>
<td>61.8%</td>
<td>346</td>
<td>100%</td>
</tr>
</tbody>
</table>
From Table 4.8 it is clear that majority at 57.8% agreed with the assertion that World Space Radio needed proper experience for highly effective teaching and learning. Only 33.5% disagreed and 8.7% were neutral. This implies an appreciation by the teaching staff of the need for proper experience and preparedness in the use of WSR for consequent effective teaching and learning.

When the respondents were asked if as teachers, they had the requisite experience to enhance utilization of WSR for teaching and learning, 59.0% disagreed, 37.3% agreed and 3.8% were undecided. This is an indication that teachers did not consider themselves adequately experienced to use WSR for effective teaching and learning in their respective schools.

When asked if teachers had learnt on the best way to use WSR, 59.8% disagreed, 36.1% agreed and 4.0% were undecided. This implies that teachers either by their own volition or by efforts of another had not learnt effective use of WSR.

On whether teachers’ long experience in use of WSR had improved utilization of WSR for teaching and learning, 60.1% disagreed, 34.7% agreed and 5.2% were neutral. This implies that teachers did not have long experience in the use of WSR. On whether the teachers were adequately proficient in the use of WSR, 58.7% disagreed, 37.3% agreed and 4.0% were undecided. This implies a lack of WSR proficiency among teachers.

When the respondents were asked if teachers used WSR frequently at least once a week, 61.3% disagreed, 35.8% agreed and only 2.9% were undecided. This implies that there was minimal use of WSR for teaching and learning. Finally when the respondents were asked if the teaching methodology when using WSR was inclusive and highly efficient in teaching and learning,
61.8% disagreed, 32.9% agreed and 5.2% were neutral. This implies that there was a problem with the methodology employed for using WSR which further hampered the preparedness of teachers.

4.6 Influence of content to curriculum on Utilization of WSR in teaching and Learning

The third objective sought to establish the extent to which relevance of content to curriculum influences utilization of world space radio in teaching and learning in primary schools. The result is as seen in Table 4.9
<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>We have content for our WSR curriculum</td>
<td>203</td>
<td>15</td>
<td>128</td>
<td>346</td>
</tr>
<tr>
<td>It’s my opinion that the content is current and works for the WSR curriculum</td>
<td>117</td>
<td>13</td>
<td>216</td>
<td>346</td>
</tr>
<tr>
<td>The school Syllabus is in line with the content for WSR</td>
<td>108</td>
<td>16</td>
<td>222</td>
<td>346</td>
</tr>
<tr>
<td>We make our own content for WSR curriculum, tailor made to suit the needs of our pupils</td>
<td>118</td>
<td>15</td>
<td>213</td>
<td>346</td>
</tr>
<tr>
<td>We get content from government which is not relevant to our pupils and hence hinders utilization of WSR</td>
<td>199</td>
<td>16</td>
<td>131</td>
<td>346</td>
</tr>
<tr>
<td>The content for WSR syllabus is sufficient for teaching and learning and has greatly helped WSR utilization</td>
<td>107</td>
<td>15</td>
<td>224</td>
<td>346</td>
</tr>
</tbody>
</table>
From Table 4.9 it is evidently clear that majority at 58.7% agreed that they had content for their WSR curriculum. Only 37.0% disagreed and 4.3% were undecided. This is an indication that there was content that WSR would use to teach in primary schools.

When asked if it was their opinion that the content was current and worked for the WSR curriculum, 62.4% disagreed, 33.8% agreed and 3.8% were undecided. This implies that while the content was available, it was not contemporaneous and relevant for pupils teaching and learning. When the respondents were asked if the school Syllabus was in line with the content for WSR, 64.2% disagreed, 31.2% agreed and 4.6% were undecided. This again implies that the content of WSR as it stood was not conformed to current syllabus.

On whether teachers made their own content for WSR curriculum, tailor made to suit the needs of our pupils, 61.6% disagreed, 34.1% agreed and 4.3% were neutral. This implies that teachers relied on content that would often not suit the peculiar need of their pupils. When the respondents were then asked if they got content from government which was not relevant to pupils and hence hindered utilization of WSR, 57.5% agreed, 37.9% disagreed and 4.6% were undecided. This is an indication that the government through its curriculum development agency provided content but which, according to teachers, was not relevant.

Finally, when asked if the content for WSR syllabus was sufficient for teaching and learning and had greatly helped WSR utilization, 64.7% disagreed, 30.9% agreed and 4.3% were undecided. This implies that the content for WSR curriculum was irrelevant and did not therefore help in teaching and learning. This is a far cry from what has been happening in other countries.
4.7 Influence of Teachers’ Attitude on WSR in teaching and Learning

The fourth objective sought to explore the extent to which teachers’ attitude influenced utilization of world space radio for teaching and learning in primary schools. The results are as seen in table 4.10.

Table 4.10 Influence of Teachers’ Attitude on WSR in teaching and Learning

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th></th>
<th>Undecided</th>
<th></th>
<th>Disagree</th>
<th></th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
<td>Count</td>
<td>Percent</td>
</tr>
<tr>
<td>World Space radio is necessary for highly effecting teaching and learning</td>
<td>220</td>
<td>63.6%</td>
<td>25</td>
<td>7.2%</td>
<td>101</td>
<td>29.2%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>As teacher, I have laid down proper lesson plans to enhance utilization of WSR</td>
<td>92</td>
<td>26.6%</td>
<td>21</td>
<td>6.1%</td>
<td>233</td>
<td>67.3%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>As teacher I have created motivational talks with learners on the benefits of WSR</td>
<td>94</td>
<td>27.2%</td>
<td>25</td>
<td>7.2%</td>
<td>227</td>
<td>65.6%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>I am trained in the use of WSR and I know firsthand its benefits</td>
<td>92</td>
<td>26.6%</td>
<td>21</td>
<td>6.1%</td>
<td>233</td>
<td>67.3%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>I much prefer use of ICT than the old fashioned WSR</td>
<td>217</td>
<td>62.7%</td>
<td>26</td>
<td>7.5%</td>
<td>103</td>
<td>29.8%</td>
<td>346</td>
<td>100%</td>
</tr>
<tr>
<td>Because of negative attitude towards WSR on the part of teachers, its utilization has greatly been hampered</td>
<td>228</td>
<td>65.9%</td>
<td>28</td>
<td>8.1%</td>
<td>90</td>
<td>26.0%</td>
<td>346</td>
<td>100%</td>
</tr>
</tbody>
</table>
It is clear from Table 4.10 that majority at 63.6% agreed that World Space radio was necessary for highly effecting teaching and learning. Only 29.2% disagreed and 7.2% were neutral. This implies that the respondents were aware of the benefits of WSR for teaching and learning.

On whether as teachers, they had laid down proper lesson plans to enhance utilization of WSR for teaching and learning, 67.3% disagreed, 26.6% agreed and 6.1% were undecided. This implies a lack of preparedness by teachers to teach using WSR which may be due to their negative attitudes towards the innovation.

On whether, as teachers they had created motivational talks with learners on the benefits of WSR, 65.6% disagreed, 27.2% agreed and 7.2% were neutral. This implies that teachers were unwilling to motivate learners on the benefits of WSR.

When asked if the respondents were trained in the use of WSR and knew firsthand its benefits for learning, 67.3% disagreed, 26.6% agreed and 6.1% were neutral. This implies that there was lack of sufficient training by teachers on the effective use of WSR. When asked if they much preferred use of ICT than the old fashioned WSR for teaching and learning, 62.7% agreed, 29.8% disagreed and 7.5% were undecided. This implies that the attitude towards WSR was dampened and transferred to the more sophisticated ICT using the computer tool. Finally, when the teachers were asked if negative attitude towards WSR on the part of teachers, had hampered its utilization, 65.9% agreed, 26.0% disagreed and 8.1% were neutral. This implies a presence of negative attitude towards WSR.
4.8 Correlation Analysis
As part of the analysis, Pearson’s Correlation Analysis was done on the Independent Variables and the dependent variables. Summative scales were used to run the correlation. The results is as seen on Table 4.11

<table>
<thead>
<tr>
<th></th>
<th>WSR Utilization</th>
<th>WSR Infrastructure</th>
<th>Experience &amp; Preparedness</th>
<th>Attitude</th>
<th>Content to curriculum</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSR Utilization</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WSR Infrastructure</td>
<td></td>
<td>.635**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>346</td>
<td>346</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience &amp; Preparedness</td>
<td></td>
<td>.615**</td>
<td>431**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>346</td>
<td>346</td>
<td>346</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td>.558**</td>
<td>.400**</td>
<td>.157**</td>
<td>1</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.000</td>
<td>.002</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>346</td>
<td>346</td>
<td>346</td>
<td>346</td>
<td></td>
</tr>
<tr>
<td>Content to curriculum</td>
<td></td>
<td>.701**</td>
<td>.258**</td>
<td>.128</td>
<td>.527**</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td>.005</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>346</td>
<td>346</td>
<td>346</td>
<td>346</td>
<td>346</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
Pearson correlation analysis was conducted to examine the relationship between the variables. The measures were constructed using summated scales from both the independent and dependent variables. As cited in Wong and Hiew (2005) the correlation coefficient value \( (r) \) range from 0.10 to 0.29 is considered weak, from 0.30 to 0.49 is considered medium and from 0.50 to 1.0 is considered strong. However, according to Field (2005), correlation coefficient should not go beyond 0.8, to avoid multicollinearity. Since the highest correlation coefficient is 0.701 which is less than 0.8, there is no multicollinearity problem in this research (Table 4.5).

All the independent variables had a positive correlation with the dependent variable with Relevance of content to WSR curriculum having the highest correlation of \( (r=0.701, p<0.01) \) followed by availability of WSR complementing infrastructure with a correlation of \( (r=0.635 p<0.01) \) and then teachers’ experience and preparedness with a correlation of \( (r=0.615 p<0.01) \).

Teachers’ attitude had the least correlation of \( (r=0.558 p<0.01) \). This indicates that all the variables are statistically significant at the 99% confidence interval level 2-tailed. This shows that all the variables under consideration have a positive effect and relationship with the dependent variable.

4.9 Summary

This chapter has presented the findings of the study based on the research objectives. It has been found that utilization of world space radio in teaching and learning has a positive and strong relationship with availability of World Space radio complementary infrastructure; teachers’ experience and preparedness; relevance of content to curriculum; and teachers’ attitude.
CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter contains a summary of findings, discussions, the conclusions drawn and the recommendations made thereof. It finally offers the suggestions for further research.

5.2 Summary of Findings

5.2.1 Availability of WSR Complimenting Infrastructure

This study sought to determine the extent to which availability of World Space radio complementary infrastructure influences utilization of world space radio in teaching and learning in primary schools. From the findings, majority confirmed that there was a WSR programme in their school and many said that the schools did not completely have WSR Complementing infrastructure. Few of the respondents used WSR for teaching Art subjects, languages, Mathematics, sciences, and some for none of the selected subjects. Further, majority agreed with the assertion that power outages was a constant challenge in the effective utilization of WSR in teaching and learning.

5.2.2 Teachers’ Experience and Preparedness

Further the study sought to explore the extent to which teachers’ experience and preparedness influences utilization of world space radio in teaching and learning in primary schools. From the findings, majority confirmed that World Space Radio needed proper experience for highly effecting teaching and learning. When the respondents were asked if as teachers, they had the
requisite experience to enhance utilization of WSR for teaching and learning, more than half disagreed. When asked if teachers had learnt on the best way to use WSR, still more than half disagreed. On whether teachers’ long experience in use of WSR had improved utilization of WSR for teaching and learning, majority disagreed. Finally when the respondents were asked if the teaching methodology when using WSR was inclusive and highly efficient in teaching and learning, majority disagreed.

5.2.3 Relevance of Content to WSR Curriculum

Based on the third objective on establishing the extent to which content to curriculum influences utilization of world space radio in teaching and learning in primary schools, majority agreed that they had content for their WSR curriculum. The school Syllabus was not in line with the content for WSR and teachers did not make their own content for WSR curriculum, tailor made to suit the needs of our pupils. Schools got their content from government which was not relevant to pupils and hence hindered utilization of WSR. Finally, the content for WSR syllabus was not sufficient for teaching and learning and had greatly hampered WSR utilization.

5.2.4 Teachers Attitude

On this, World Space radio was necessary for highly effecting teaching and learning. However teachers had not laid down proper lesson plans to enhance utilization of WSR for teaching and learning. Further, teachers had not created motivational talks with learners on the benefits of WSR. The teaching staff was not well trained in the use of WSR and they much preferred use of ICT than the old fashioned WSR for teaching and learning. Finally, the teachers’ negative attitude towards WSR had hampered its utilization.
5.3 Discussion of the Findings

On availability of WSR Programme, the issues is in agreement with Friends, (2009) who had noted that in order to meet the challenges of Free Primary Education, the Kenya Government introduced world space radio broadcasts to schools to supplement and improve classroom teachers’ work and the quality of education at distance. The fact that there was a programme means that such targets had the potential of being met. On WSR compatible infrastructure, its unavailability is a fact that is agreed to in literature. Resource support in terms of human, material, and financial has been considered indispensable in determining the successful implementation of an innovation (Carless, 2009; Li, 2008).

Carless (2009) considered innovation complementing infrastructure a crucial resource in the promotion of innovation. He claimed that WSR complementing infrastructure can help minimize the extra workload associated with innovation, and in particular can provide vital support for untrained and inexperienced teachers who have weak subject knowledge. Through WSR, curricula can be more easily updated, adapted, enriched and personalized to satisfy a broad range of learning needs (Feimich, 2007). And as such need complementing infrastructure to improve its further utilization. However, both Feimich (2007) and Carless (2009) have argued that lack of WSR complementing infrastructure has over the years hindered proper utilization of WSR in teaching and learning in schools.

On teacher preparedness and experience of WSR for effective teaching and learning and whether it is necessary, literature supports the assertion by noting that from experience, teaching with any medium requires careful planning. If world space radio programmes are to be used effectively the teachers’ role must be spelt out clearly. Proper utilization of radio programmes in the
classroom involves many things. Some of these requirements are based on teachers’ attitude and others depend on the classroom environment, weather condition, the number of students in the class and the availability of media resources (Odero, 2010; Christen, 2008). Teachers did not consider themselves adequately experienced to use WSR for effective teaching and learning in their respective schools.

Experience and studies (Venezky and Davies, 2001; Fullan, 2001) reveals that the role of teacher is very important in the effective utilisation of radio programmes. However due to lack of experience and proper preparedness, the classrooms are not organized to provide the optimum conditions for listening. Teachers in Kenya have been advised about the problems of unorganised classes during broadcasts. This creates confusion and should be avoided (Venezky and Davies, 2001).

They did not have long experience in the use of WSR. Both Hawkridge, and Robinson (2002) and Heinich et al (2002) had argued that in actual sense most teachers were inexperienced and ill prepared to use any ICT tool, WSR included, because of lack of financial, human and infrastructural resources which hindered the teachers and students exposure to worthwhile systems like WSR. This therefore means that the finding here is supported by recent literature further giving the impression that teachers inexperience was a hindrance to WSR utilization which consequently negatively impacted on teaching and learning in primary schools. There was a lack of WSR proficiency among teachers. Anzolena (2008) had argued, in support of this finding, that by using the appropriate materials, skills and classroom techniques, radio programmes can be used efficiently and easily by both teacher and learner but with lack of such proficiency such a programme is bound to fail. The KIE, (2005) report also noted that teachers
lacked proficiency of WSR because of lack of opportunities to learn it thus affecting teaching and learning particularly in rural schools where computers have not been adopted yet.

Radio programmes assist teachers in taking unfamiliar topics through the way in which the curriculum content is presented (Anzolena, 2008). Some teachers find the programmes useful to revise what they have taught and to introduce new topics at certain times. In some schools, teachers use radio programmes to overcome the shortage or lack of reference books, classroom textbooks and other conventional instructional materials. However, all of these instructional radio advantages are now difficult because the programmes are not professionally prepared, frequently used and pre-tested at all levels to ensure that they achieve the goals of teaching and learning (Heinich et al, 2002). Kane (2008) had further asserted that when the methodology is wrong, preparedness of teachers inevitably gets hindered too.

There was curriculum content that WSR would use to teach in primary schools. This is in agreement with Plomb et al (2003) who had argued that most schools, even those with non-functional WSR programme, had some original or initiator content for the programme and that the only problem was having sufficient WSR infrastructure to effectively actualize the available content for teaching or learning. They further added that the relevance of such content would also be called to question as much of it was often outdated. However, while the content was available, it was not contemporaneous and relevant for pupils teaching and learning. Both Lacey (2007) and Mishra (2005) asserted that when content of any programme is old-dated and irrelevant, the pathos of such a programme gets lost in the rubble of its own irrelevance and cannot be replaced with anything. This of course makes both the teaching and learning of it boring, stale and out of order.
The content of WSR as it stood was not conformed to current syllabus. Such a situation is known to occur when the content is outdated and has not been brought to tally with current syllabus which has considered new information and trends needful for effective teaching and learning in schools (Moulton, 2004; Neal, 2003; Mishra, 2005). Such a situation therefore speaks of irrelevance of the particular content to curriculum. Teachers relied on content that would often not suit the peculiar need of their pupils. Kinsler and Gamble (2002) argued that there is often a major problem as the content for WSR curriculum has often been irrelevant that it has often hindered the proper utilization of WSR in teaching and learning. Christen (2008) then argued that quality content for WSR curriculum must be tailor made to suit the peculiar needs of the learners for it to be relevant and spur useful utilization of WSR. Such a scenario has been found in other studies (Pennycuick, 2008; Rogers, 2005; Thomas, 2001) and so is not peculiar to this situation. In fact Mishra (2005) in discussing the findings of a study he did in Ghana noted that content needs to be tailor made for particularly students in the rural areas, infusing local examples in such content to bring educational concepts closer home.

The content for WSR curriculum was irrelevant and did not therefore help in teaching and learning. This is a far cry from what has been happening in other countries. So far according to Dagron, (2009) the content is considered relevant that it has spurred high utilization of WSR in schools.

Teachers were aware of the benefits of WSR for teaching and learning. Among other benefits, when speaking about world space in teaching and learning Kozma (2000) says that WorldSpace, with its extensive reach and low-cost terminals, offers a viable solution to increase the access to global educational resources. This solution includes audio formats, asynchronous multimedia
delivery and creation of virtual classrooms with instructor-led, synchronous delivery of audio-visual presentations. These help enhance the quality of education delivery across Africa and Asia. There was however a lack of preparedness by teachers to teach using WSR which may be due to their negative attitudes towards the innovation. This is in line with Pelgrum (2004) assertion that where teachers were unwilling to engage with a particular program, no tangible preparation plan, like lesson plans, was forthcoming largely because they had developed negative attitude about the program. Odero (2010) had noted that teachers were often in a positive attitude towards WSR as they had intentions regarding broadcasts learning by expressing their views concerning improving learning, motivating learners, widening access, extending knowledge, improving listening skills and extending learning opportunities (Odera, 2010; Pelgrum, 2004).

Teachers who do not have positive expectations for WSR use or do not instill or support a culture of technology use; integration is inhibited (Anderson & Dexter, 2000). Therefore, teachers who don’t have knowledge, skill and positive attitudes towards implementing WSR in schools become hindrances to innovation (Tyack & Cuban, 2005).

This study found that attitude towards WSR was dampened and transferred to the more sophisticated ICT using the computer tool. This is again in disagreement with Odera (2010). 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 has helped to improve their classroom presentation and helped them tackle difficult topics and further that they did not have any major preference for ICT as opposed to WSR.
5.4 Conclusion of the Study

Based on the objectives and findings of the study, the following is the conclusion:

WSR complementing infrastructure was unavailable, there was lack of teacher experience and preparedness, the content to WSR curriculum was irrelevant and there was poor teacher attitude towards WSR which, thus, significantly negatively influenced Utilization of WSR in teaching and learning in Primary schools in Ugenya District.

5.5 Recommendations

Based on the objectives and conclusions this study recommends;

1. The government through the Ministry of Education and Finance should provide more funds for acquisition of WSR complementing infrastructure to consequently breathe life to WSR for teaching and learning by pupils. School administrators should on the other hand, prudently make use of WSR complementing infrastructure already at their disposal.

2. Teachers should embark, with the help of their respective school administrators, on effective WSR lesson planning which would spur teacher preparedness of WSR for teaching and learning. The teachers should seek to expose themselves more to WSR so as to improve on their experience on WSR.

3. Curriculum developers should review WSR content to make it more current and relevant particularly for pupils in rural schools. The developers should promote local teacher involvement in content formulation to help tailor make the content to suit local pupils and consequently improve teaching and learning using WSR.
4. School managers should proactively promote the benefits of WSR in teaching and learning to help create a positive attitude of the innovation among the teaching staff. They should do this through seminars, workshops and motivational talks, inviting resource persons who have successfully utilized WSR to promote the innovation.

5. The Ministry of Education should review the ICT policy to pay special focus on WSR adoption in primary schools for effective teaching and learning.

5.6 Suggestions for further research

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

1. Head teachers’ attitude towards WSR in teaching and learning. This is important because this study has particularly focused on teachers and yet head teachers also have a role to play.

2. The place of WSR in the ICT policy. This is because the ICT policy seems to focus more on computers like laptops while giving lip service to WSR.

5.7 Summary

Chapter five presented a summary of findings showing that WSR complimenting infrastructure was unavailable, the teachers were not experienced and prepared to use WSR, the content to WSR Curriculum was irrelevant and the teachers’ attitude was poor. This led to the conclusion that the factors affecting WSR negatively and significantly influenced its utilization. Thus it has been recommended that both the Ministry of Education and school administrators do something to help salvage the situation.
References


Rogers, A. (2004). *Non-formal education: Flexible schooling or participatory education?* Hong Kong Comparative Education Research Centre, University of Hong Kong.


Teachers, Ugenya Public Primary Schools

Ugenya District,
Kenya

**RE: Permission to Collect Data about factors Influencing The Utilization of World Space Radio in Teaching and Learning**

Dear Sir/Madam,

I am a student undertaking Masters in Distance Education of the University of Nairobi. You have been selected to participate in the study of the “factors influencing the utilization of World Space Radio in teaching and learning in public primary schools in Ugenya District, Siaya County, Kenya.” This questionnaire is prepared to ask question about the utilization of WSR in schools and its advantages. For the purpose of keeping the information confidential your name and that of the school is not required. You are therefore asked to answer the questions correctly and honestly by ticking (✓) in the right box or filling in the right number in the appropriate box.

**Yours sincerely**

Ochieng Joseph Ambrose
Appendix 2: Questionnaire for teachers

SECTION A – Background Information

Instructions

1. Please answer all questions

2. Please indicate by ticking [√] your view

1. Sex

- Male ( )
- Female ( )

2. Age

- a. 20-29 ( )
- b. 30-39 ( )
- c. 40-49 ( )
- d. 50-54 ( )
- e. 55 and above ( )

3. Type of school:

- i. Day ( )
- ii. Boarding ( )
- iii. Day/boarding ( )

4. School Setting

- i. Urban
- ii. Semi-urban
- iii. Rural
SECTION B

Level of availability of World Space compatible infrastructure

Instructions

1. Please answer all questions

2. Please indicate by ticking [√] your view

5. Do you have World Space Radio Programme in your School?
   Yes (  ) No (  )

6. Do you have the entire WSR compatible Infrastructure in your School?
   Yes (  ) No (  )

7. In which subjects do you use WSR as a teaching tool (Tick all that apply)
   a. Mathematics (  )
   b. Sciences (  )
   c. Languages (  )
   d. Art (  )
   e. Music (  )
   f. All of the above (  )
   g. None of the above (  )
   h. Others (please specify)__________________

8. What WSR Tools do you lack in your school that would be important for quality teaching and learning?
   a) ..........................................................
9. Do you experience challenges with lack of power which hinders utilization of World space radio?

Yes ( ) No ( )

SECTION C

Teacher Experience and Preparedness

1. The table below shows the effects of teacher experience on the use of world space radio.

Please answer all questions and please indicate by ticking [√] your view.

SA-Strongly Agree, A-Agree, U-Undecided, D-Disagree, SD-Strongly Disagree

<table>
<thead>
<tr>
<th></th>
<th>SA</th>
<th>A</th>
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<th>D</th>
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<tbody>
<tr>
<td>World Space radio needs proper experience for highly effecting teaching and learning</td>
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<tr>
<td>As a teacher, I have the requisite experience to enhance utilization of WSR for teaching and Learning</td>
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<tr>
<td>As a teacher I have learnt on the best way to use WSR</td>
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<td>My long experience in use of WSR has improved utilization of WSR</td>
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<td>I am adequately proficient in the use of WSR</td>
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<td>We use WSR frequently at least once a week</td>
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<td>Our teaching methodology when using WSR is inclusive and highly efficient in teaching and learning</td>
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<tr>
<td>Generally, there is lack of proper experience and preparedness in WSR use which has hindered WSR utilization</td>
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SECTION D

Content for Curriculum

2. The table below shows the effects of headteacher experience on the use of world space radio. Please answer all questions and please indicate by ticking [✓] your view.

SA-Strongly Agree, A-Agree, U-Undecided, D-Disagree, SD-Strongly Disagree

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<tr>
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<tbody>
<tr>
<td>We have content for our WSR curriculum</td>
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<tr>
<td>It’s my opinion that the content is current and works for the WSR curriculum</td>
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<tr>
<td>The school Syllabus is in line with the content for WSR</td>
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<tr>
<td>We make our own content for WSR curriculum, tailor made to suit the needs of our pupils</td>
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<tr>
<td>We get content from government which is not relevant to our pupils and hence hinders utilization of WSR</td>
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<tr>
<td>The content for WSR syllabus is sufficient for teaching and learning and has greatly helped WSR utilization</td>
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SECTION E

Teacher attitude on the use of world space radio

3. The table below shows the effects of teacher attitude on the use of world space radio.

Please answer all questions and please indicate by ticking [✓] your view.

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<tr>
<td>World Space radio is necessary for highly effecting teaching and learning</td>
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<tr>
<td>As teacher, I have laid down proper lesson plans to enhance utilization of WSR for teaching and Learning</td>
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<tr>
<td>As teacher I have created motivational talks with learners on the benefits of WSR</td>
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<td>I am trained in the use of WSR and I know firsthand its benefits for learning</td>
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<td>I much prefer use of ICT than the old fashioned WSR for teaching and Learning</td>
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<td>Because of negative attitude towards WSR on the part of teachers, its utilization has greatly been hampered</td>
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Appendix 3: Interview Schedule For DEO

1. To what extent does the availability of World Space radio complementary infrastructure influence utilization of world space radio in teaching and learning in primary schools?

2. To what extent does teachers’ experience and preparedness influence utilization of world space radio in teaching and learning in primary schools?

3. To what extent does content to curriculum influences utilization of world space radio in teaching and learning in primary schools?

4. To what extent does teachers’ attitude influence utilization of world space radio for teaching and learning in primary schools?

5. What are the hindrances to world space radio utilization?

6. As DEO what needs to be done to improve utilization of WSR?
Appendix 4: Authority Permit from Ministry of Education
Appendix 5: Authority Letter from the Department
### Appendix 6: Kathuri and Pals (2006), Sample Size Table

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*N = Population size; S = sample size*