FACTORS INFLUENCING USE OF VIDEO MEDIATED TECHNOLOGY BY PUBLIC EXTENSION AGENTS IN DISSEMINATING AGRICULTURAL INFORMATION AND SKILLS TO FARMERS IN HOMA BAY COUNTY, KENYA

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DECLARATION AND RECOMMENDATIONS

Declaration

This thesis is my original work and has not been submitted or published for the award of a degree in this or any other university or college.

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Recommendation

This thesis has been submitted with our approval as university supervisors.

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DEDICATION

This thesis is dedicated to my sons; Rodanim Owiti & Samuel Odhiambo and to my wife Hellen Ngunya for their patience and understanding during my long stay away from home.

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ABSTRACT

The role of agricultural extension as a mechanism of transmitting technical information to trigger change among farming communities is central in imparting the farming skills in the wider society. Due to the rate of growth of ICT in information dissemination, the conventional methods of extension delivery in which the agricultural extension agents interact with farmers face to face only has become less effective with age. Video Mediated Technology (VMT) could be applied efficiently in enhancing farmers' capacity to access and acquire new information and skills. This intervention has gained wider use worldwide in improving extension service delivery to farmers. However, factors influencing its uptake and use by public extension agents has not been studied and adequately documented in Homa Bay County. The purpose of the study was to determine the factors influencing use of VMT by public extension agents in Homa-Bay County. The study focused on VMT as an intervention to improve extension teaching and learning. The study used descriptive survey design. Single-stage cluster sampling was used and data was collected through census method from all the 85 public agricultural extension officers from the Ministry of Agriculture in the County. A structured questionnaire was used to collect the data. The validity of the questionnaire was ascertained through discussion with extension experts, experienced researchers at Egerton University, four peers and supervisors. The instrument produced a Cronbach's Alpha reliability coefficient of $\alpha = 0.78$ after a pilot test in Migori County on 30 extension agents. Data was cleaned, coded and analyzed at a confidence level of 0.05alpha with the aid of the computer programme, Statistical Package for Social Sciences (SPSS) version 22 based on the study objectives. Data was analyzed using descriptive statistics and inferential statistics and the results were presented in form of frequency tables, pie chart, bar graphs, averages and percentages. Linear regression analysis was used to test the hypotheses. The findings indicate that there was low use of VMT among majority of extension agents. The study also established that there was a significant influence of extension agents' personal characteristics, VMT characteristics, institutional characteristics and extension environment characteristics on use of VMT. The study recommends capacity building of extension agents to use VMT through exclusive in-service training programmes and refresher courses, involvement of public institutions in developing a curriculum in VMT for agricultural development and establishment of strong agricultural communication networks. This is significant for policy on learning, dissemination and adoption of agricultural productivity enhancing technologies.

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LIST OF ABBREVIATIONS AND ACRONYMS

APIS	Agricultural Practices Information Services
ATCs	Agricultural Training Centres
CDs	Compact Discs
DoI	Diffusion of Innovation
DVDs	Digital Visual Discs
FAO	Food and Agricultural Organization of the United Nations
FFS	Farmer Field School
FRI	Farm Radio International
GOK	Government of Kenya
GSMA	Group Special Mobile Association
ICIPE	International Centre of Insect Physiology and Ecology
ICPM	Integrated Crop and Pest Management
ICT	Information Communication Technology
KALRO	Kenya Agricultural and Livestock Research Organization
KEFRI	Kenya Forestry Research Institute
MFA	Model Farm Approach
MOALD	Ministry of Agriculture and Livestock Development
NACOSTI	National Commission for Science and Technology Innovations
NALEP	National Agriculture and Livestock Extension Programme
NGO	Non-Governmental Organization
NSSO	National Sample Survey Organization
PEAs	Participatory Extension Approaches
PPT	Push-Pull Technology
SAP	Structural Adjustment Programme
SRI	Sugar Research Institute
T&V	Training and Visit
TAM	Technology Acceptance Model
TOT	Transfer of Technology
UNDP	United Nations Development Programme
VML	Video Mediated Learning
VMT	Video Mediated Technology
WGAE	Working Group on Agricultural Extension

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The goals of agricultural extension include transferring information from the global knowledge base and from local research centres to farmers, enabling them to clarify their own goals and possibilities, educating them on how to make better decisions, and stimulating desirable agricultural development (Gautam, 2000). Thus, extension services provide human capital-enhancing inputs, including information flows that can improve rural welfare, an important outcome long recognized in the development dialogue (World Bank, 2002).

Investments in extension services have the potential to improve agricultural productivity and increase farmers' incomes, especially in developing economies, where more than 90 percent of the world's nearly one million extension personnel are located (Rivera, Qamar & Van Crowder, 2001). Yet the impact of extension on farm performance is varied, reflecting differences in how extension services are delivered and in the circumstances of service recipients. Effective extension involves adequate and timely access by farmers to relevant advice, with appropriate incentives to adopt the new technology if it suits their socioeconomic and agro-ecological circumstances. Critical to adoption are the availability of improved technology, access to modern inputs and resources and profitability at an acceptable levels of risk (Anderson & Feder, 2004).

Farmers get information from many sources. Public extension is one source, but not necessarily the most efficient. Thus, although extension can improve the productive efficiency of the agricultural sector, the virtues and limitations of alternative mechanisms need to be considered in assessing the cost-effectiveness of delivering information. In Kenya, research findings are disseminated both through agricultural extension agents as intermediaries and also directly to farmers by publications, Group Approach, Farmers' Training Centres, On-farm demonstrations, Mass-media announcements and Visits (Gundu,1991).

Video mediated learning sessions are more effective than conventional workshop training in enhancing farmers' knowledge about various agricultural production methods, changing their attitude and finally taking a decision to adopt these methods. Agricultural extension is more effective with the use of facilitated video learning and this process clarifies complex agro-ecological principles, bias and normative perceptions of the learners. In addition, video-

mediated learning is not only transferrable across villages, but also works well in combination with other media such as radio, television and mobile phones (Chowdhury, Odame, Thompson & Hauser, 2015).

Video Mediated Technology (VMT) is the application of educational videos in solving instructional challenges in extension and in improving farmers' ability and interest to learn new agricultural knowledge and skills (Ferriman, 2013). The world's knowledge on use of videos in facilitating learning of agricultural skills by extension agents among farmers has been a great intervention (Suarez, Ching, Ziervogel, Lamaire, Medler & Wiser, 2008). Don Snowden pioneered VMT in 1967 on Fogo Island, Canada and since then British local education authority, Asian countries such as Bangladesh, Saudi Arabia and India (Van Mele, Wanyoeke & Zossou, 2010a) has used it widely. It has been used to enhance self-learning by grassroots people and has emerged to be a powerful medium for knowledge sharing and in producing change in attitude in a cost effective format and engaging for both creators and users (Okello et al., 2012; Soniia & Asamoah, 2011; Van Mele, Zossou, Vodouhe & Wanyoeke, 2010b; Suarez et al., 2008).

Video Mediated Technology has been successfully used in training farmers in several African countries such as Ghana, Benin, Tanzania and Uganda particularly as part of Participatory Rural Appraisal (PRA) process (Johannson, 2000). In Kenya for example, video dubbed ''*Springs of Life*'' proved an effective tool for creatively communicating difficult subjects such as AIDS, without a cure, prevention through effective communication and education continue to be a key components in slowing the spread of HIV/AIDS (Kitii & Amalemba, 2000). In Homa-Bay County, ICIPE has successfully and effectively used video in training farmers on how to control striga weed, stem borer and improve soil fertility (Amudavi et al., 2009). The empirical evidence from Murage (2010) study concluded that the power of videos could thus enable extensive and intensive learning of various agricultural skills and technologies by farmers. Using videos as learning tool engages the farmers and enables skills and practices to be shown in a short period, and standardizes the technical information disseminated (Vidya & Chinnaiyan, 2010).

Over one and a half decades, the Government of Kenya and other stakeholders have used several extension approaches such as Training and Visit (T & V), Model Farm Approach, Farming systems and Catchment approach. These extension approaches alone without

incorporation of ICTs, partially succeeded in delivering extension information to the farmers as expected, thus extension remains weak in technology transfer (Anderson & Feder, 2004), a factor that has contributed to low acquisition of agricultural knowledge and skills among farmers. Moreover, a report by Ministry of Agriculture and Livestock Development (Government of Kenya, 2010) indicated that the effectiveness of extension services in Rachuonyo Sub County, in Homa-Bay County, has been declining over the past years. This is due to less use of interactive information pathway ICTs and low uptake of new technologies and a sharp reduction in human resources. Consequently, retention of new knowledge and skills facilitated only by linear extension messages may be short-lived (Bentley, 2009). These inefficiencies can be overcome with participatory extension approaches (PEAs).

Video Mediated Learning has been proved to be ideal for working with small-scale farmers around the world to enable farmer-to-farmer sharing of innovations and experiences and linking them to key stakeholders including policy makers and development agencies (Gandhi, 2007). Video provides an opportunity for learning, dissemination and adopting improved technologies while building skills and capacity for addressing constraints in better production relationships (Johansson et al., 1999). Video forms a two-way communication networks that gather and use both implicit and explicit knowledge for increased farm productivity. Participatory videos offer considerable potent for improving the quality of farmer-to-farmer learning and stimulating interests and involvements in agricultural production (FAO, 2009). Using video as a training tool engages the participants, enables new techniques and practices to be shown in a short period, and standardized information to farmers (Vidya & Chinnaiyan, 2010). Repetitive learning process is possible with electronic recording, which is why video as a tool has an advantage of shaping up the ability of slow learners, illiterate individuals, the aged and even children and across gender (Rivera, 2006).

Video as an audio-visual channel helps to overcome illiteracy and language barriers among video participants/farmers (Van Mele, Salahuddin & Magor, 2008). Ferriman (2013) reported that learning video could not only improve short-range recall but can also aid in retention because it allows for variation in message delivery and to a great way demonstrates and reinforce information explained in text. Video Mediated Technology allows for storage and quick retrieval of documented information among farmers unlike other conventional methods (Lunch & Lunch, 2006). Farmers therefore, learn more things from meticulously designed videos on technologies than conventional extension methods and can add value and build the

learning outcomes (Van Mele, Salahuddin & Magor, 2008).These qualities make video an important extension channel tool for effective dissemination of agricultural skills among farmers in Homa-Bay County. Khan et al. (2007) recommended simplification of agricultural messages through interactive methods that provide interactive learning opportunities to enable sourcing of information on various agricultural knowledge.

In a related study, Munyua (2008) emphasized that inoder to improve productivity; the smallholder farmers need access to improved technologies, best practices, appropriate, timely, comprehensive information and knowledge on production, value addition and markets. Hence, the uptake of skills will depend on how extensive and intensive farmers are trained and the effectiveness of dissemination pathways used. Dissemination of agricultural information and skills in the past has been through extension methodologies such as field days, print materials, radios, farmer teachers, FFS, among others (Amudavi et al., 2009). Adoption of new knowledge and skills that is facilitated by these existing extension service delivery methods only may be short-lived due to large number of farmers, vastness of the area to be traversed by the agents and poor transport infrastructure (Bentley, 2009).The speed of changing technology calls for effective access of new knowledge and skills. Farmers who are illiterate can easily access information through their mobile phones or television at their convenient time allowing them to give more time to farm work (Okello, Kirui, Njirani & Gitonga, 2012). Despite the many benefits of VMT, its use in solving agricultural information dissemination problems still faces hurdles.

The use of VMT in training farmers is prominent with International Research Organizations such as International Centre of Insect Physiology and Ecology (ICIPE) in promoting the Push-Pull Technology in Mbita, Suba and Rachuonyo South sub counties and not MOALD. The VMT would be ideal for Homa-Bay Sub county farmers as it would be faster and effective in reaching many farmers in the area. This is one region in the western Kenya with large number of school leavers and local farmers. They have shown interests in varied farming enterprises such as dairy, poultry, sugarcane, watermelons, rice, maize, sorghum among many others as their main livelihood and therefore require area specific skills to help them improve their farm productions.

1.2 Statement of the Problem

The conventional methods of extension information delivery in which the agricultural extension agents interact with farmers face to face only has come of age due to high growth rate of ICT which enables the farmers to access new information and technical knowhow faster. Homa-Bay County is vast and extension agents are few in number, hence cannot traverse the whole area to meet the information needs of the many farmers in the county. This calls for use of VMT by extension agents to transmit relevant information to farmers faster and efficiently. Video mediated teaching and learning is considered as an empowering extension method that offers considerable strength for improving the effectiveness of dissemination of agricultural information, knowledge and skills, for it uses the power of images and enables storage and quick retrieval of information. It is being promoted as an intervention to improve the extension service delivery. Farmers have greatly benefited from video mediated learning, which has proved successful through trials by ICIPE in the same county. However, its uptake and use by agricultural extension agents in Homa Bay County still faces hurdles and remains low. This study sought to determine the factors influencing uptake and use of VMT by agriculturalextension agents in disseminating agricultural information and skills to farmers in Homa Bay County.

1.3 Purpose of the Study

The study sought to determine the factors that influence use of video mediated teaching and learning process by public agricultural extension agents in information dissemination to farmers in Homa Bay County, Kenya.

1.4 Objectives of the Study

The study was guided by the following objectives:

i) To determine the influence of extension agents' personal characteristics on their ability to use VMT in disseminating agricultural information and skills to farmers in Homa Bay County.
ii) To determine the influence of video characteristics on its use in disseminating agricultural information and skills to farmers by public extension in Homa Bay County.
iii) To examine the influence of extension institutional characteristics on use of VMT resources by agricultural extension agents in teaching agricultural knowledge and skills to farmers in Homa Bay County.

iv) To examine the influence of extension environment characteristics on use of VMT by public extension agents in disseminating agricultural information and skills to farmers in Homa Bay County.

1.5 Hypotheses of the Study

The four objectives were translated into the following hypotheses:

$H0_1$: Extension agents' characteristics have no statistically significant influence on use of VMT, for dissemination of agricultural information and skills to farmers in Homa-Bay County.

$H0_2$: Video characteristics have no statistically significant influence on its use for, dissemination of agricultural information and skills by public extension agents in Homa Bay County.

$H0_3$: Extension institutional characteristics have no statistically significant influence on use of VMT, for dissemination of agricultural information and skills by public extension agents in Homa-Bay County.

$H0_4$: Extension environment characteristics have no statistically significant influence on use of VMT, for dissemination of agricultural information and skills by public extension agents in Homa-Bay County.

1.6 Significance of the Study

This study explained how the application of VMT in dissemination and learning of agricultural technologies is relevant in guiding extension practitioners (including Ministry of Agriculture and Livestock Development, Research organization, NGOs and relevant stakeholders) on how to improve information dissemination of agricultural technologies to farmers for increased levels of production. The results obtained from the study could be of value to extension agents in increasing the efficiency of dissemination, acquisition and use of agricultural information and skills among farming communities for improved farm production. The results may also serve as a reference material for policymaking and further research on extension teaching and learning technologies, dissemination and subsequent adoption. The study further also provides the farmer with quicker ways of accessing technical knowhow and skills in agriculture.

1.7 Scope of the Study

The study focused on the use of Video Mediated Technology by agricultural extension officers in dissemination of agricultural information and skills to farmers in Homa Bay County. Aspects

of uptake addressed by the study included the use, proportion of users and frequency of use of VMT as a tool for promoting dissemination of agricultural information and skills through focusing on its utilization of audio-visual images in increasing capacity for learning and understanding, retention of knowledge, storage and quick retrieval of information. Aspects of the barriers to use of VMT involved individual extension agents' characteristics, video characteristics, extension institutional characteristics, extension environment characteristics and the general challenges encountered by public extension officers in use of videos as an approach to enhance teaching of farmers.

1.8 Assumptions of the Study

The study was based on the assumption that the selected respondents in the study would be willing to give accurate and honest responses to the questions posed by the researcher and that the respondents have access to video or smart phones.

1.9 Limitations of the Study

The study was limited by the fact that it focused only on the agricultural extension service providers from the Ministry of Agriculture, Livestock and Fisheries Development who were few in number and focused just on one county. The sub county head offices from where the data were collected by the researcher were distantly located from one another within the county and this slowed down the data collection process, as many movements had to be involved.

1.10 Definitions of Terms

The following operational terms are used in this study:

Adoption: Is the decision to start using something such as an idea, technology or a plan. In the context of this study, it refers to the acceptance by the extension agents to use VMT in enhancing learning and dissemination of agricultural ideas and knowledge to farmers.

Diffusion of technology: According to Rogers and Shoemaker (1971), diffusion of technology is the process of spreading a new idea from the source of invention or creation to its ultimate users or adopters. In the context of this research, diffusion refers to the process through which the videos are regularly used and circulated among farmers by extension agents in a facilitated manner to describe the various farming activities performed.

Dissemination: Is the spread of information and technologies through various means of communication. For the study, it refers to events in which extension agents share locally produced videos with farmers in a training session using Pico projectors.

Extension agents' characteristics: Are the features by which describe extension agents. For this study, the attributes described included competence, attitude, level of awareness, gender, age and level of formal education.

Extension in Agriculture: According to Purcell and Anderson (1997), the World Bank defines extension as ''the process of helping farmers to become aware of and adopt improved technologies to enhance their production efficiency, income and welfare.'' For this study, extension involves dissemination of agricultural messages to farming communities using VMT as a dissemination channel and approach while aiming at increased productivity to address food security issues and improved livelihoods.

Extension Environment: These are characteristics of where extension teaching and learning take place such as availability of training centres, electricity and farmers' level of exposure.

Extension Institutional Characteristics: Are administrative features such as financial support, technical support, training, training rooms, internet installations that are enabling for the adoption and use of video mediated technology.

Participatory video: is an iterative process, whereby communities use video to document innovations and ideas of focus on issues affecting their environment and community (Johansson et al., 1999). In the context of the study, Participatory Video referred to the process through which videos were regularly used for training and circulated in a facilitated manner to describe the various farming activities performed on different agricultural aspects that farmers can adopt.

Public extension Institutions: Are state managed organizations that offer extension services to farmers. Such state agricultural bodies include MOALD, KALRO, SRI and KEFRI.

Reliability of VMT: This was conceptualized to mean predictability or assurance to access and use the various video instructional materials upon choice to do so by Extension Agents.

Technology: According to Tomei (2002), ‘‘Technology” is the application of behavioral and physical sciences concepts and other knowledge to the solution of problems.

Use: This refers to a purpose for which something is employed. In this study, the term referred to incorporation of videos as part of extension teaching to reinforce learning by farmers.

Use of Video Mediated Technology: Video as a learning technology is the application of educational videos to the solution of specific instructional problems in extension teaching. Stuart (1976) associates instructional technology with some type of equipment and specifies that radio, television and films and computers are instructional technologies. Beggs (2000) further defined instructional technology as the use of technology to achieve an instructional objective**.** Video is an electronic medium for the recording, storing, copying and broadcasting of moving visual images. In this study, Video Mediated Technology (VMT) will be frequently used alongside instructional media and instructional materials to mean all video materials and equipment that are used to enhance the teaching and learning process by extension agents in extension teaching, while use will refers to a purpose for which something may be employed. In this study, the term will refer to incorporation of videos as part of extension teaching to reinforce learning by farmers.

Video characteristics: Refers to features of video such as availability of video materials, accessibility and reliability and how these variables may influence the adoption and use of VMT (Ferriman, 2013).

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter reviews the general literature related to the study. It is organized into the following subtopics under the objectives of the study and focuses mainly on; agricultural and rural extension worldwide, extension service delivery over the years in Kenya, use of videos in extension service delivery, factors influencing use of video mediated technologies and ends by providing a theoretical basis and conceptual framework for this study.

2.2 Agricultural Extension Worldwide

Agricultural extension is an exchange of technical knowledge and skills among researchers, extension agents and farmers. The core responsibility of extension agents is to advise and educate farmers on how to make better decisions, enabling them to clarify their own goals and possibilities in order to stimulate desirable agricultural development (Van Mele, Wanyoeke & Zossou, 2010a). The role of agricultural extension as a mechanism of transmitting technical information to trigger change among farming communities is a central issue in enhancing agricultural production and food security in the wider society (Van Mele, Salahuddin & Magor, 2008).

Agricultural extension provides nonformal agriculturally related continuing adult education, community resource development, group promotion and cooperative organizational development (FAO, 2009). In the past, the worldwide extension approaches that have been used to disseminate agriculture related information to farmers include the General Extension Approach, Commodity Specialized Approach, Farmers Field Schools, Participatory Approach, Project Approach, Farming Systems Development Approach, Cost Sharing Approach and Education Institution Approach among others (FAO, 2001).For systems in developing countries to survive, Swanson(2006)proposed that they must focus on technologies that can facilitate knowledge and skills dissemination to a wider audience of farmers at convenient times and places. White (2003) argues that communication approaches that are participatory are recognized as powerful tools and processes to foster change and empower people to make informed decisions, supports dissemination of knowledge and skills.

Agricultural extension in Kenya is aimed at the farming communities regardless of farm size and areas of activity. The role of agricultural extension is seen in the context of linking

mechanism. Leonard (1991) defines its functions as linking agricultural research centres and farmers and transmitting new technologies relevant to the farmers' current problems with a view to finding solutions. In Kenya, agricultural extension serves as a link between the cultivator and supplier, credit and markets. Supplies, credit and markets can be described as some of the functional components in any agricultural system.

Research forms the nucleus of extension because it is the focal point where new facts about farming are discovered, which can subsequently be disseminated to the farmers by extension agents. Rees, Momanyi, Wekunda, Ngungu, Odondi and Oyure (2000) observes that weakness in any of these functions can hold back the development of the whole system, thus making it pointless for an extension service to promote improved practices for the production of crops and livestock in the absence of market outlet, just as agricultural research would be wasteful if there were no means of diffusing results to farmers. In any case, the most important thing is to get the farmers to accept new techniques in terms of high productivity.

Sustainability of technical knowhow and information delivered to different farmer categories is essential if the farmers are involved, and it improves the effectiveness of extension service (Van Mele, Zossou, Vodouhe & Wanyoeke, 2010b). Knowledge and skills for sustainable agriculture can be delivered in a variety of ways: through verbal means by typically involving a trained facilitator, printed materials and information communication technologies (ICTs), including two way ICTs such as mobile phones, the internet and video (Soniia & Asamoah, 2011). Video, which combines both visual and verbal communication methods, appears to be an appropriate extension tool that can curb the inefficiencies of existing extension methodologies, as this medium is suited for the transmission of agricultural skills and allows for the standardization of information for accurate transmission from a technical source to low literacy populations of farmers (Vidya & Chinnaiyan, 2010). Video is one of the potent ICT tools that can be used for enhancing smallholder farmers' capacity for learning and dissemination of agricultural technologies to diversified farming communities (UNDP, 2011).

Video Mediated Technology utilizes technological acceptance theory which is a spontaneous process directed by farmers themselves to record events, processes or ideas on amateur video for creating narratives that communicates unique local perspectives (Pink, 2004). VMT process aims at creating unique content that communicate what those who participate in the process would really want to convey in a way they think is appropriate (Johansson, Knippel, Waal &

Nyamachumbwe, 1999). VMT has been used worldwide to enhance teaching and self-learning by grassroots people and has emerged as a powerful medium for knowledge sharing, in a cost effective format and engaging for both creators and users (Van Mele, Salahuddin & Magor, 2008). Earlier work in Ghana, Benin, India, and Bangladesh has considered the success of VMT in different perspectives, including effectiveness in learning and dissemination process of knowledge and skills among rural communities (Johansson et al., 1999). In Mbita and Rachuonyo sub counties, Kenya, use of Video by ICIPE has proved successful and effective in training farmers on how to control stalk borer, striga weed and improve soil fertility hence the need of MOALD to embrace its use (Amudavi, Khan, Wanyama, Midega, Pittchar & Hassanali, 2009).

2.3 Approaches used in Extension Service Delivery in Kenya

Extension involves dissemination of agricultural messages to farming communities using appropriate dissemination channels and approaches while aiming at increased productivity to address food security issues and improved livelihoods (Van Mele, Zossou, Vodouhe & Wanyoeke, 2010b). It is an education process, which involves conscious use of communication to help people form sound opinions and make good decision (Yakubu, Abubakar, Atala & Muhammed, 2013). As noted by Basu, Pinaki and Bhadoria (2011), the process of extension education is one of working with people, not for them, but helping them become self-reliant and central actors in the teaching-learning process. The World Bank defines extension as ‘‘the process of helping farmers to become aware and adopt improved technologies to enhance their production efficiency, income and welfare’’ (Purcell & Anderson, 1997).

The extension approaches that have been previously used include; Training and Visit (T &V), Model Farm Approach, Farming Systems and Catchment approach (Government of Kenya, 2010; Suluiman, Hall & Suresh, 2005). The information transmitted through some of these extension approaches are short-lived (Bentley, 2009; Raabe, 2008; Van Mele, Salahuddin & Magor, 2005). The main reasons for the failures of some of these extension approaches include; limited involvement of farmers as they adopted the Transfer of Technology (TOT) model which is a top-down extension delivery system, low levels of farmers’ literacy, experience in testing and adopting technologies and lack of fitness of the technology to the existing farming systems (Asiabaka, 2005; Bindlish & Evenson, 1993). The said extension approaches have not been fully successful as evaluated and reported by (Swanson, 2006; Rolling, 2004) hence use

of facilitated participatory videos may be appropriate to both educated farmers and those with low literacy levels.

In Kenya, since 1963, agricultural extension services were largely provided by the government until the late 1980s. In 1990s, the established models of delivery of extension services began to shift in favour of those that involved farmers in the design or prioritization of the services (Wanga, 1999). This re-orientation of extension towards participatory process was catalyzed by the increasing realization that effective and sustainable extension programmes could be achieved with the more active participation of various end-users, especially farmers (Reddy, & Swanson, 2006). Structural adjustment programmes (SAPs) crippled many of the extension services through introduction of reforms, which included major retrenchment in the civil service and government budget reduction programmes (Rees et al., 2000). These inefficiencies can be overcome with Participatory Extension Approaches (PEAs). The common theme to these participatory extension approaches is the full participation of farmers in the process of learning about their needs, opportunities and the action required to address them (Hakiza et al., 2004). Participatory approaches to development are ultimately indebted to the Brazilian educator; Freire (1970) whose ‘‘problem posing’’ approach to empowerment encourages the emergence of critical consciousness through facilitator group-led discussion and learning. It is postulated that farmers learn more from designed videos viewed and discussed with their fellow farmers than non-viewers/participants of the videos (Van Mele, Salahuddin & Magor, 2008).

The revival of agricultural extension service delivery has become necessary in many African countries as a way to address new challenges facing smallholder farmers, including food insecurity, environmental degradation and climate change (Birner et al., 2006; Birner & Anderson, 2007). Such efforts have been in the area of disseminating new technologies generated by public and private sector research organizations through appropriate dissemination strategies such as demonstrations, field visits, farmers' meetings, and use of video media to address these challenges. According to MOALD (2001), extension service enhances activities related to education, transfer of technology, change of attitudes, human resource development and the gathering and dissemination of information. According to Bentley et al. (2007), extension methods should be chosen for a particular context. To improve productivity, the smallholder farmers need access to improved technologies, best practices, and to appropriate, timely and comprehensive information and knowledge on production, value addition and markets (Munyua, Adera & Mike, 2008). Presently, agricultural extension is the

main source of information for smallholder farmers since it is affordable and accessible to most of them (Musa, Githeko & El-Siddig, 2012).

However, the public extension providers still use other extension approaches in existence such as field days, print materials, radio and others, which have been considered less effective means of information dissemination by extension agents to farmers despite the emergence of other audio-visual approaches such as Video Mediated Technology that are useful in reinforcing learning. Homa Bay County has large number of farmers that needs to be reached with information; the vastness of the area to be traversed by agents and poor transport infrastructure in some parts limits effective dissemination of agricultural information to farmers (Okello et al., 2012).

Use of locally produced or sourced videos as a method can speed up the development of extension service delivery, can be instrumental in strengthening partnerships and in providing a framework of shared learning (Van Audenhove, 2003). Video Mediated Learning (VML) as an intervention fits well within the extension definition in relation to the knowledge acquisition, dissemination and its use by the extension agents for improved and sustainable agricultural production. Hence, VML should be promoted as a supplement to conventional extension methods since it offers high potential for improving the quality of learning and dissemination of knowledge intensive agricultural technologies.

2.4 Extension Structure System in Kenya

The government body charged with overseeing the extension system is the Ministry of Agriculture and Livestock Development. The extension system has undergone a series of reorganization (Evenson & Mwabu, 1998). These have been directed at streamlining the functioning units with a view to ensuring efficiency and effectiveness. At present, the Ministry operates an Agricultural Extension and Service Division, which comprises Agricultural Extension, Agricultural Information Services, Home Economics, Rural Youth and Farm Management branches (Guatam, 2000). One of the major functions of these systems is to promote extension by organizing and disseminating agricultural information to extension workers, farmers, pastoralists and all those other groups or individuals interested in farming.

The Agricultural Information Services of the Agricultural Extension Services Division comprise of the National Agricultural Documentation Centre, the Agricultural Information

Centre and a Central Library with branches in regional and sub counties offices, Agricultural Institutes and Farmer Training Centres. In addition, there are libraries in agricultural research stations, which were formerly administered directly by the Ministry of Agriculture and Livestock Development (Gundu, 1991).

2.5 Use of Videos in Extension Service Delivery

Video is an electronic medium for the recording, storing, copying and broadcasting of moving visual images (Ferriman, 2013). Participatory Video is a set of techniques to involve a group or community in shaping and creating their own film describing how they employ different agricultural aspects and skills in solving certain agricultural problems while aiming at increasing production (Ramirez & Quarry, 2004; Rivera, 2006). These films are then sourced, adopted and used by extension agents to train other farmers who could be facing similar problems in other regions who may also use these videos at their discretion at home. The emerging strategy of extension agents using videos to teach farmers agricultural skills and knowledge has revolutionized extension work dissemination in solving agricultural problems around the world (Van Mele, Zossou, Vodouhe & Wanyoeke, 2010b). The idea behind this is that, making a video is easy and accessible, and is a great way of bringing people together to explore issues, voice concerns or simply to be creative and tell stories. This process can be empowering, enabling a group or community to take action to solve their own problems by implementing the right practices as observed in the videos and to communicate their needs and ideas to decision-makers and/or other groups and communities (Lunch & Lunch, 2006). As such, participatory video can be a highly effective tool to engage and mobilize marginalized people and to help them implement their own forms of sustainable development based on local needs.

Results from a study on cognitive theory of multimedia learning (Isiaka, 2007; Mayer & Moreno, 2000; Sharm & Vyas, 2003) have shown that visual images stay in the mind longer than any information conveyed by another medium. The sustaining force of video as emphasized by White (2003) is its completeness, flexibility and its intimate visual potential that can change thinking, clarify and create ideas and alter personal behaviour that makes it ideal for learning a technology or skill. A study conducted in Ghana by African Rice Centre and Benin university of Abomey found that two-thirds of rural women farmers creatively applied ideas illustrated by participatory videos demonstrating improved food processing techniques to parboil more and better the quality of rice.

Video is a powerful medium for knowledge sharing, in a cost effective manner, and it is particularly successful when produced by people from within the community, where the beneficiaries themselves take the centre stage in the process of filmmaking (Ovwigho, Ifie, Ajobo & Akor, 2009). The video self-training method is innovative and cost effective method of training many farmers quickly with minimal distortion of facts (Omatayo, 2005). Video is a versatile and can be used in remote areas to raise awareness on issues that concerns local farming communities or can be put on You tube to reach the world (FAO, 2009; Gandhi et al., 2007). Video addresses real personal development needs of people through improvements in confidence, self-esteem and personal responsibility that are commonly elusive when approached through prescriptive conventional teaching and training methods (Thomson, 2008).

Other existing extension approaches if combined with participatory methods such as VMT, may help extend the benefits of available information to all those who could take advantage of it, in a way that is sufficient to local needs and constraints (Suarez et al., 2008). Video create variation in teaching and learning, capture learners' attention and important in explaining difficult and abstract concepts with procedural aspects (Charles & Senter, 2002; Bullock & DeStefano, 2001; Van Mele et al., 2010a). The meagerness of studies on the factors influencing adoption and use of Video Mediated Technology as an agricultural information and technology delivery tool could be a reason for the slow uptake of this approach by extension officers (Gandhi et al., 2007; Van Mele, Wanyoeke & Akakpo, 2010c Zossou et al., 2009).

2.6 Factors Influencing Use of Video Mediated Technology

The use of video as an instructional technology should be backed up with encouragement, ready access, availability, training, positive attitude and support before extension agents take steps towards enhancing how and what they teach with the use of technology (Brace & Roberts, 1996). According to Spodark (2003), this is an enabling environment that caters for universal learner access, reliable networks, multiple opportunities for training, and consulting, and a faculty character that values experimentation and implementation of new ideas. Several factors contribute to the use of technology. According to reviewed studies, when these are available, extension agents are likely to use video-mediated technology.

2.6.1 Extension Agents' Characteristics

Use of video mediated technology by extension agents in extension teaching of farmers is likely to be favoured by user's personal characteristics such as training, attitude, age, gender, and work experience. Training instills new skills and abilities to perform tasks that were not possible previously. It provides confidence in extension agents and in undertaking of their duties. Okello et al. (2012) observed that while training is an investment in the skill and productivity of programs, administrators tend to look at costs and programmers often and see loss of production time. Although sometimes written materials may be available for them to read about how to produce and use instructional materials, good training courses are almost and always superior because they effectively drill concepts into a format that is easy to master (Musa et al., 2013). According to research by Turner (1996) on soliciting ideas from trainers about media specialists and what instructional assistance they would desire from the library media specialists, their responses showed that training is a key ingredient to use the emerging instructional technologies effectively, in enhancing learning and to motivate their learners. Training on the use of instructional technologies should be done before, during and after the employment of extension agents.

Pre-service and In-service training through organization of conferences by the administration on how an emerging extension communication technology works is important (Munyua, 2008).Extension agents need properly organized workshops and seminars with several presenters for hands-on experiences to learn on the use of technology. In this way, they learn to operationalize some of the technologies in extension teaching. Brace and Roberts (1996) noted that lack of training creates a barrier to one's ability to use technology in general.

In California, in addition to the initial training on use of technology in the classroom, workshops and conferences organized by government and other organizations, increased trainers' exposure to technologies, improved their proficiency and competence in using those instructional technologies (Ivers, 2002). Ivers corroborates that the more confident instructors feel about using a technology, the more likely they will apply what they have learned in the classroom, as well as pursue additional learning opportunities.

Lack of effective training as referred to in the literature is a great barrier for the extension agents on the adoption and use of a new technology (Albirini, 2006; Balanskat, Blamire & Kefala, 2006; Beggs, 2000; Ozden, 2007; Toprakci, 2006). In a study by Pelgrum (2001), the

findings identified lack of enough training opportunities and in-service programs as one of the major barriers for instructors on the use of a technology in teaching and learning. According to British Educational Communication and Technology Agency (2004), the issue of training is certainly important and several components should be considered for its effectiveness. These components include time for training, pedagogical training, skills and technology use in initial teacher training.

According to a study by Gomes (2005), emphasized the need of digital literacy, pedagogic, and demonstrative training as prerequisites to use of an instructional technology in a teaching-learning situation. Some Saudi Arabian studies, reports lack of training for trainers on the instructional technology as one of the causes of failure in using educational technologies which could also apply to extension agents use of VMT (Alhamed, Alotaibi, Motwaly & Zyadah, 2004). Shortage of trained personnel who are qualified to use technology is the reason to low adoption and use of the technologies as supported by (Sager, 2001). In Australian research, new house (2002) found that many instructors lacked the knowledge and skills to use computer.

Current research by Munyua (2008) on factors influencing use of ICTs in extension in African countries has shown that the level of determinant differs from country to country. In the developing countries, research findings support that trainers' lack of technological competence is a main element to acceptance and adoption of a technology. The result of a study conducted by Balanskat et al. (2006) have shown that in Denmark, many trainers still choose not to use instructional technologies and media in training processes because of their lack of technology skills rather than academic reasons. Hence, lack of extension service providers' competence is one of the strong barriers to the integration of technologies into education. It may also be one of the factors involved in resistance to change. In Kenya, Okello et al. (2012) supports that little are known about the use of instructional technologies such as interactive videos for agricultural transactions and this could be an important factor in adoption and use of VMT.

The findings of a study by Watson (1999) on the barriers to the integration of an instructional technology in extension teaching and learning also corroborates that attitude of the extension agents towards embracing a new extension strategy greatly influences their decision to either adopt it or not (Earle, 2002; Gomes, 2005; Schoepp, 2005). As reiterated by Gomes (2005), negative attitude towards use of a new strategy is a barrier to integration of an instructional technology in a teaching-learning process. According to Watson (1999), the study suggests that

it is important to consider users' attitudes towards change because their beliefs influence what they do in their fields. One key area of extension agents' attitudes towards the use of technologies is their understanding of how these technologies will be of benefit to the training process and information dissemination to farmers as supported by British Educational Communication and Technology Agency (2004).

According to Earle (2002), pulling factors facilitate the change from a present level to a desired level of performance. As reiterated by Schoepp (2005), extension agents are unlikely to use new technologies in information dissemination if they see no need for change in their undertakings in respective professional fields. Instructors majorly reject the need for change because of perceptions and attitudes they hold towards an intervention, hence this study seeks to establish the perception of the extension agents on the use of VMT.

2.6.2 Video Characteristics

For agricultural extension officers to use instructional technologies in extension teaching, the technologies should be made available. Teaching materials can be substituted, improvised and still deliver the same message. However, some technologies cannot be substituted and improvised, for example, videos, overhead projectors and computers. Such materials need to be supplied by the institution or the Ministry of Agriculture. According to the study by Hope (1997), the findings emphasized that for a technology to be exploited in an environment, it must first exist.

Concerning access to relevant video resources, some instructional technologies are designated in special rooms like computer labs and audio-visual rooms where overhead projectors and video equipment are kept. These special rooms need to be easily accessed by members of staff when they need to use a particular technology. The findings of Musa, Githeko and El-Siddig (2013), emphasized that staff members of an institution need access to networked computer, audio-visual equipment and must be readily available. It should be noted that, availability and accessibility are slightly different because sometimes the equipment may be available at the public agricultural institutions but kept under strict rules. According to the findings of Okello et al. (2012), the study recommended a checkout system that makes technology available and accessible any time and everywhere. Such accessibility and reliability enhances lesson preparation and delivery as well as eliminating frustrations that extension agents may have if they cannot access particular resource they have planned to use. Access to the video resources

by both extension agents and farmers will have a positive impact on its use. Lack of access to video resources may be another complex barrier that discourages extension agents from integrating new knowledge and skills into demonstrative and instructive training.

As supported by Silicia (2005), inaccessibility of technology resources in the institutions may limit their integration in training by the extension agents. Inappropriate video content that are irrelevant to the farmer's need or lack of personal access of these videos by the service providers is also a challenge (Balanskat et al., 2006). The barriers related to the accessibility of new technologies for trainers are widespread and differ from country to country. The findings of a study by Empirica (2006), also found that lack of access to instructional technology tools is the largest barrier and this could apply to use of VMT by extension agents. Similarly, in a study by Korte and Husing (2007), the findings indicated that in training institutions there are some infrastructural barriers that limit integration of ICTs. These were insufficient audio-visuals and computers, insufficient peripherals, insufficient numbers of copies of educational CDs and DVDs in the training institutions and were the barriers to the successful implementation of instructional technology into education. This study also seeks to establish some of the institutional barriers to the adoption and use of VMT in extension in Homa-Bay County.

Unfortunately, just as Majed (1996) remarked that decision makers in various Ministries do not emphasize the importance of instructional media in institutions due to tight budgets hence instructional media do not come in their priorities, or that they do not know much about them. Based on household and individual access and usage survey conducted across 17 African countries, Gillwald, Calandro, Moyo and Stork (2010) found out that the diffusion of ICTs such as video and television is highly uneven, concentrated in urban areas and leaving some rural areas almost untouched due to inability to acquire relevant videos (Okello et al., 2012). In addition, provision of ICT services would require electricity, which is limited in most places of rural Africa (Van Mele et al., 2010c). Gillwald and Stock (2008), argued further that, availability of technology is an important factor, particularly in the use of audio-visual media. The medias such as videos, the availability of enabling infrastructure such as electricity, power sockets and right content of videos in CDs or DVDs are major factors that the governments need to ensure are in place in various extension environments and agricultural institutions. Other resources such as internet connection within the institution are also a key factor. It may

be useful in accessing agricultural websites by extension agents to source for videos they feel have relevant content for training farmers.

There is also need for compatibility of the video contents to the training needs for successful adoption and the use of a technology. According to the Diffusion of Innovations theory (Rogers, 1995) an individual forms an attitude toward the innovation based on its compatibility to his or her needs, leading to a decision to adopt or reject it, and if the decision is to adopt, then implementation of the innovation follows. Based on the analysis of the technological innovation literature concerning characteristics of innovations, Tornatzky and Klein (1982) identified compatibility as innovation characteristics that are silent to the attitude formation.

The positive perceptions of the benefits of video use content in extension should provide an incentive for small agricultural public institutions to adopt the innovation. Compatibility is the degree to which an innovation is perceived as being consistent with the existing values, needs, and experiences of the potential adopter and environment where it is to be used (Rogers, 1995). If the information system is compatible with existing needs of the farmers as the end users, then small agricultural institutions that provide extension services will be more likely to adopt and use the participatory videos.

2.6.3 Extension Institutional Characteristics

Different support systems have to be in place to enable continuity and sustainability when new skills are taught (Okello, Kirui, Njirani & Gitonga, 2012). Adequate implementation of instructional technologies requires training, financial and technical support from extension administrators, as well as monitoring and encouraging extension agents to integrate use of instructional technologies in their training (Munyua, 2008). It is important that administrators take the initiative to organize in-house discussions and sharing of ideas on how some of the technologies can be incorporated in extension information dissemination and learning. As observed by Hope (1997), institutional leadership must foster an environment where trainers are encouraged to be creative and to explore innovations like VMT. Without good leadership with a vision, technology cannot reach its potential in extension providing institutions.

The findings of Beggs (2000), affirmed that there is need for technical support as extension officers first use instructional technology. The support can be in the form of technical assistance, installation and configuration of equipment and applications, and troubleshooting

of hardware and software (Brace & Roberts, 1996). Such assistance could also center on how to operate certain equipment, like video or overhead projectors (Weller, 1996).

Technical support is necessary in that without both good technical assistance in the service delivery, and whole-institution resources, extension service providers cannot be expected to overcome the barriers preventing them from using video mediated technology as an instructional medium (Lewis, 2003). According to the study by Pelgrum (2001), the findings indicated that in the view of instructors, one of the top challenges to use of instructional media in training is lack of technical assistance. As argued by Korte and Husing (2007), instructional technology support or maintenance contracts in the institutions help trainers to use a technology in training farmers without losing time through having to fix software and hardware problems. The report by British Educational Communications and Technology Agency (2004), stated that if there is a lack of technical support available in the institution, then it is likely that technical maintenance will not be carried out regularly, resulting in a higher risk of technical breakdowns. Many of the respondents to British Educational Communications and Technology Agency's survey (2004) indicated that technical faults might discourage them from using instructional media in their training because of the fear of equipment breaking down during a training session.

According to Gomes (2005), integration of an instructional technology in training of farmers needs a technician who is conversant and knowledgeable about a specific technology to assist during the assembling, use and maintenance of the equipment. If one is not available, the lack of technical support can be an obstacle. In Turkey, Toprakci (2006) found that the lack of technical support was one of the significant barriers to the integration of instructional media into educational training institutions and might be considered a serious barrier. Recent findings in some countries like Netherlands, Malta and Czech Republic have recognized the importance of technical support to assist extension service providers to use visual instructional technology tools like video in the training of farmers and dissemination of technologies to farmers (Korte & Husing, 2007).

2.6.4 Extension Environment Characteristics

The area or environment where a technology is to be used plays a major role on its adoption (Rivera, 2006; Rodgers, 1995). Provision of infrastructure such as electricity, good roads for accessibility and characteristics of the end-users especially farmers are key factors that

determines success in the implementation of a technology (Okello et al., 2012). The use of VMT has witnessed an upsurge in recent years in most areas of rural life in several African countries despite the persisting problems of access, connectivity, literacy, content and costs (Yakubu et al., 2013a). The aspect of distance from information or knowledge centres is very crucial and is a significant influence on the access a farmer and extension agent has to agricultural knowledge (Asaba et al., 2006). Socio-economic factors of the farmers such as education level, family size and income, awareness of technologies, gender and access to a technology may have an influence on the adoption and use of VMT (Yakubu et al., 2013b).

According to Kahn (2000), many developing countries lack sufficient electricity supplies, especially in rural and remote areas. Mostly affected with these problems of infrastructure are the rural areas where the key producers of agricultural goods reside and extension agents work. In a study by Krishan and Haribabu (2009), the findings revealed that effectiveness of methods of communication depends on several factors. These factors include, the patterns of behaviour of the individuals forming the society, degree and standards of literacy, the soundness and utility of the programmes, age composition of the community, the stage of socio-economics, size of holdings, economic status, and above all upon the integrity of the main person behind the programme. Education level has been mentioned as one of the factors influencing access to new technologies and their subsequent adoption and use (Barret, 2007; Marenya & Sanginga & Woomer, 2009).

Farmers, most especially rice and sugarcane farmers in Homa-Bay and Ndhiwa sub counties respectively in Homa-Bay County experience many challenges with respect to information dissemination and accessibility to increase their agricultural knowledge (Okello et al., 2012). In the findings of their study, Akinola, Ogunwale and Okunade (2010), also acknowledged the importance of good infrastructure especially electricity in solving agricultural information dissemination problems using audio-visual gargets such as television, cinemas and videos. Literacy levels among the farmers are factors that enhance the effectiveness of adoption and use of media communication channels (Munyua, 2008). The potential applications of VMT to extension work include capacity to reach large audience. This helps facilitate training in order to make extension systems and structures more efficient, through better management of information system and networking, for the search and packaging of information on demand and for exploring alternative production options and technologies.

From the literature reviewed, it is evident that there has been concerted effort by various scholars in their quest to address the effectiveness in use of instructional videos in dissemination of information and skills to enhance extension teaching and learning. However, a part from these obvious beneficial characteristics of video, it was unclear to why its adoption and usage was still low for training, learning and dissemination of various agricultural knowledge and skills to smallholder farmers in Homa Bay County. The present study sought to determine the barriers to adoption and use of VMT by public extension agents. Nevertheless, it is important to note that each of these factors in isolation may not have a major influence on achievement in the adoption and use of video mediated technology in teaching farmers by public agricultural extension service systems. Instead, the factors put together can influence realization of the technology in extension.

2.7 Theoretical Framework

This study was guided by two theories namely: Diffusion of Innovation theory (DoI) (Rogers, 1995), and Technology Acceptance Model (TAM) (Davis, 1989). The DoI emphasizes that effective adoption and use of innovations are influenced by four crucial elements: the characteristics of the innovation itself, user of the innovation, the organization and environment where the innovation is to be used (Fichman & Kemerer, 1999). The proponents of this theory argued that the learning of an innovation, spread, its adoption and use occurs over time. The theory posits that the variations in innovations and the adoption contexts in which they may be applied are simply too great hence innovations communicated through effective pathways result in effective dissemination (Rogers, 1995; Balanskat et al., 2006). The relevance of this study is that the slow uptake of Video Mediated Technology in extension could be influenced by the four elements that are related to the variables of the study.

Technology Acceptance Model (TAM) has been identified as one of the most relevant and most cited model in studying user acceptance and use of technology (Davis, 1989). It specifies the casual relationships between system design features, perceived usefulness, perceived ease of use, attitude toward using and actual usage behaviour. The critiques of this model argue that it does not consider social influence, which determines whether an individual will engage or not engage in behaviour. The Technology Acceptance Theory posits that perceived usefulness and perceived ease of use determines an individual's intention to use a system with intention to use, serving as a moderator of actual system use. Perceived usefulness is also being seen as being directly impacted by perceived ease of use of the technology. In this study, TAM is relevant in

that if extension agents perceive VMT to be useful and easy to use; it influences their attitude positively, which determines the actual use. This is reflected in terms of acceptance, number of users and frequency of use of VMT in extension information dissemination to farmer.

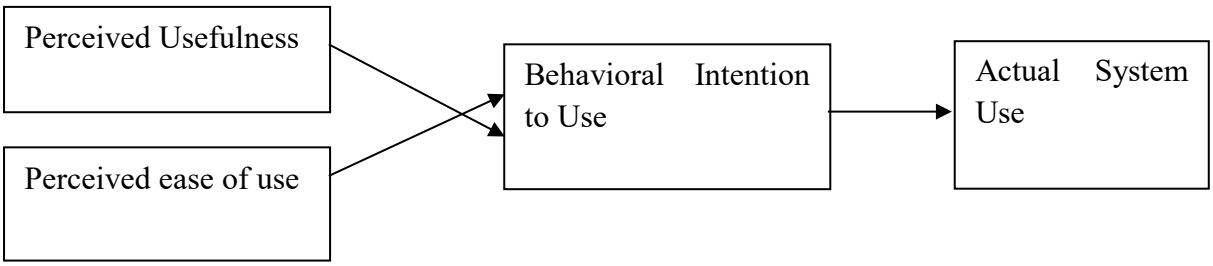

Figure 1: Technology acceptance theory
Source: Davis (1989)

2.8 Conceptual Framework

The dependent variable was the use of VMT. There were two measures of the dependent variable. The first measure was the likelihood of adoption of Video Mediated Technology in teaching, which was measured as a dichotomy, did extension agents use videos or not? The Second measure was how VMT was effectively used, frequency of use and the population of extension agents that had already adopted and used educational videos in extension teaching. This could be identified in the Diffusion of Innovation theory and could be influenced by certain factors (independent variable) that operates within four contexts namely: the individual extension-related characteristics (Level of awareness, competence, working experience and attitude). Agricultural institution-related characteristics included; financial support, trainings, technical support, internet installations and accessibility to training videos with the relevant contents. Video resource related characteristics included; availability and reliability. Characteristics of the extension environment includes; availability of electricity to support use of videos, responsiveness of farmers to training videos and accessibility to training centres within which the extension officers operates. The interaction between independent and dependent variables is further influenced by intervening variables. The intervening variables are those that are not related to the purpose of the study, but may affect the dependent variable (Kothari, 2008). In this study, intervening variables were some of the extension agents' characteristics such as cultural beliefs, gender and age, which were controlled through cluster sampling where all the extension agents from the eight sub counties were involved in the study as participants. From the title, objectives and theoretical framework, the study was conceptualized as in Figure 2.

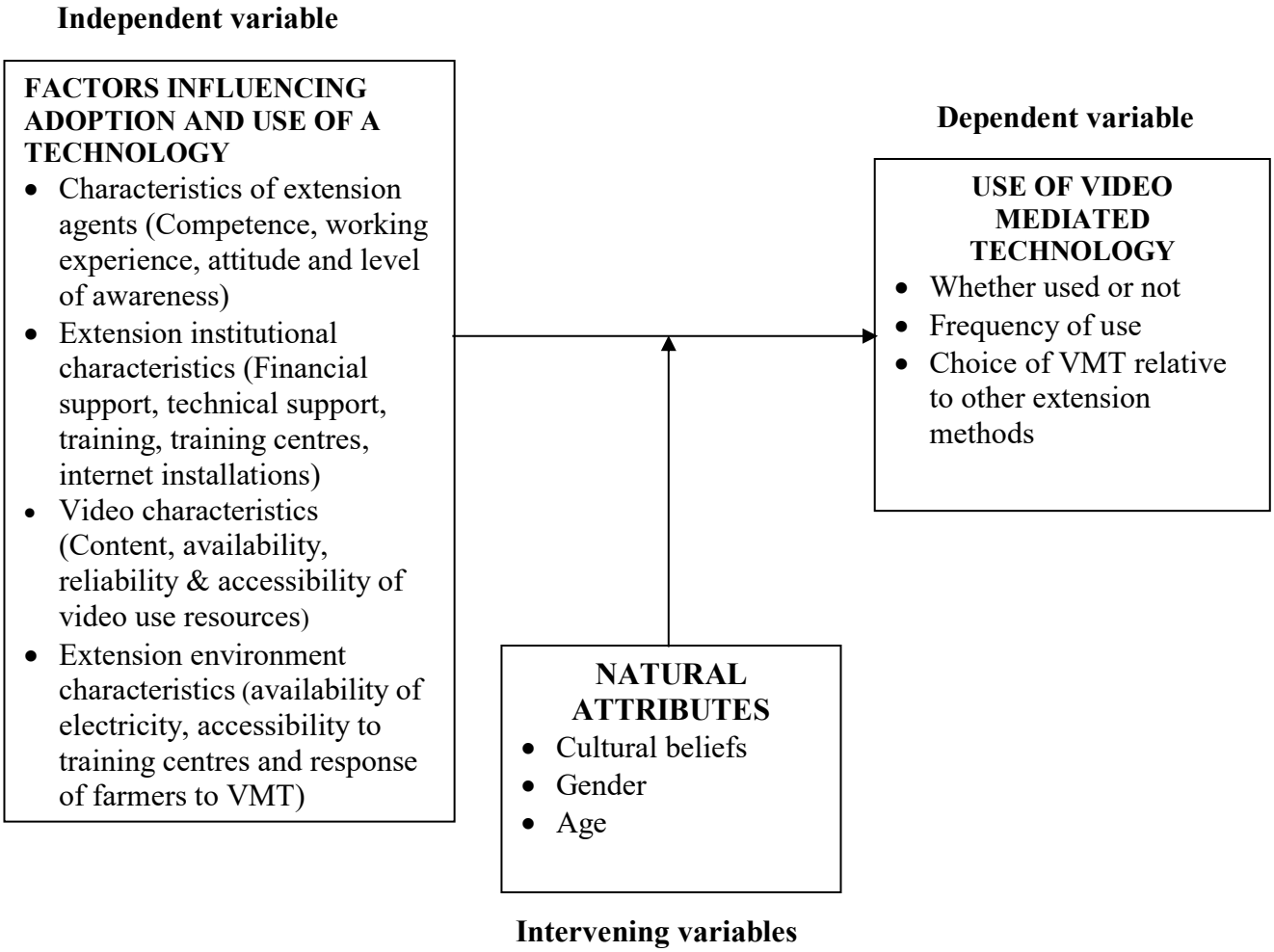

Figure 2: Conceptual framework showing relationship between variables of study.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter outlines the study design, study location, target population and sampling procedure and sample size. It also includes research instrumentation (validity and reliability), data collection procedures and data analysis, work plan and budget for the study.

3.2 Research Design

This is a descriptive study, which utilized survey design. This research design provides important leads in identifying needed emphasis and changes aimed at both dependent and independent variables (Borg & Gall, 1989). Descriptive Survey design would also enable the researcher to obtain information concerning the factors and to assess the opinions of the agricultural extension agents on how these factors influence their decision making to use video to enhance extension information dissemination to farmers (Best & Kahn, 1992; Gay, 1992).

Descriptive technique gives a vivid descriptive account of the factors to be identified and how they contribute to use of video mediated communication technology (Mugenda & Mugenda, 2003). This design is relatively faster and inexpensive compared to other designs because it enables the researcher to collect data to make inferences about the population at one point in time (Kothari, 2008). Survey designs are perfect for describing current situations, making it possible to study self-reported facts about respondents, their feelings, attitudes, opinions and habits (Kombo & Tromp, 2008). The design describes the influence between the variables and allows for hypothesis testing. Therefore, the design will be used for the study to seek information from extension agents on factors influencing their ability to adopt and use VMT in enhancing learning and dissemination of agricultural information and skills to farmers.

3.3 Location of the Study

The study was conducted in Homa Bay County in Kenya. The County is in the Western part of Kenya, along the shores of Lake Victoria. It borders Migori, Siaya, Kisumu, Kisii and Nyamira Counties. Homa Bay County was selected because of its potential in various agricultural enterprises. Homa Bay County is vast, transport challenges are numerous and the number of farmers has been increasing especially the school leavers who are taking up farming

activities as means of livelihood support, hence demands area specific information to boost their production. This scenario is also emerging when the number of extension agents who have been relying on traditional approaches to extension is declining at the time when the information super highway is expanding and moving fast through use of ICTs (Okello et al., 2012).

3.4 Target Population

The target population for the study was the entire public agricultural extension officers from the Ministry of Agriculture, Livestock and Fisheries Development in Homa Bay County. Public extension agents form an integral part in fulfilling the sustainable development goals by disseminating relevant information, knowledge and skills for improved agricultural production (Munyua, 2008). The extension agents were few in number, therefore the entire population of85 public agricultural extension officers from the Ministry was used as the accessible study population from the eight (8) sub counties that constitutes Homa-Bay County (Government of Kenya, 2010) as indicated in table 1 below.

Table 1

Distribution of public extension officers by Sub-counties

No.	Sub county	Number of Extension Officers
1.	Homa-Bay town	10
2.	Rangwe	7
3.	Mbita	13
4.	Ndhiwa	18
5.	Kasipul	7
6.	Kabondo-Kasipul	7
7.	Suba	9
8.	Karachuonyo	14
	Total	85

Source: Government of Kenya (2016).

3.5 Sampling Procedure and Sample Size

Since the target population for the study was small, a single-stage cluster sampling was used and a census method of data collection was adopted for the study. In a single-stage cluster sampling, all members of the chosen clusters are then included in the study (Ben-Shlomo, Brookes & Hickman, 2013). McLeod (2008) indicates that in cases where population is sufficiently small, census method of data collection may be assumed whereby the entire population is included in the study and the data is gathered on every member of the population. Therefore, the entire population of 85 respondents was included in the study.

3.6 Instrumentation

A researcher constructed a semi-structured questionnaire, which was self-administered to collect data from the respondents. The items in the questionnaire were based on the objectives of the study. The instrument was divided into four sections: Section A yielded information on general demographic data of respondents; Section B provided information on characteristics of VMT; Section C collected information on the extension institution's characteristics; Section D gave information on extension environment characteristics that influence use of VMT in dissemination of agricultural information and skills. Questionnaires gave the respondents greater chance of expressing their views, ideas, opinions, suggestions and specific responses in relation to variables under study. The questionnaire were responded to and collected back by the researcher after completion by the respondents for analysis.

3.6.1 Validity

Validity is a measure of the degree to which a research instrument measures what it is supposed to measure. Four peers subjected the instrument to scrutiny and the two supervisors and members in the Department of Agricultural Education and Extension to ascertain the questionnaire's content, construct and face validity before administering it for pilot study. Further, other researchers from Egerton University ascertained the research tool to ensure that the items it contained adequately covered all the concepts and relevant issues under investigation.

3.6.2 Reliability

Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials. To maximize on reliability of the research instruments, the researcher minimized the random error, which is the deviation from a true measurement.

Factors that lead to this were adequately addressed, for instance, instructions to the respondents were clearly outlined and in simple language. The instrument was piloted in Migori County to test for its reliability. Thirty extension agents were selected for the study. Migori is a neighbouring county and shares similar attributes with Homa Bay County of variables under study. The results obtained during pilot testing were analyzed and the reliability alpha coefficient was0.78, giving an acceptable instrument.

3.7 Data Collection Procedures

The researcher sought a research permit from National Commission for Science Technology and Innovations (NACOSTI) through the Graduate School, Egerton University. Upon receiving the research permit, official request to undertake the study and to access the information from the extension agents in their respective workstations was sought from the County Director of Agriculture, Homa Bay County and from respective Sub County Agricultural Officers. Contacts of the respondents in various sub counties were sought and they were informed in advance accordingly about the study and to expect the researcher. Individual visits were scheduled and the researcher administered the questionnaires to individual extension officers in their workstations. The purpose of the study was explained to the respondents and they were assured of the confidentiality of the exercises that would follow in the study.

3.8 Data Analysis

Both descriptive and inferential statistics were employed in the data analysis of the variables involved. The null hypotheses were tested at 0.05 level of significance. Collected data was cleaned, coded and analyzed using the Statistical Package for Social Sciences (SPSS). Analyzed data was presented descriptively using frequencies, pie charts, bar graphs percentages, averages and standard deviation. Linear regression analysis helped determine whether there was statistically significant relationship between the selected factors and use of VMT in agricultural extension in Homa-Bay County. Correlation test points at the relationships between variables under study (Kathuri & Pals, 1993).

Table 2

Data Analysis Summary

Hypotheses	Independent Variables	Dependent Variables	Statistical tests
$H0_1$ Extension agents' characteristics have no statistically significant influence on use of VMT for teaching of agricultural knowledge and skills by extension agents in Homa-Bay County.	Extension agents' characteristics (competence, attitude, level of knowledge, age, gender, education level and level of experience)	Use of Video Mediated technology • Proportion of users • Frequency of use	Linear regression analysis
$H0_2$Video characteristics have no statistically significant influence on its use for teaching of agricultural knowledge and skills by extension agents in Homa-Bay County.	Video characteristics (content, availability and accessibility of video and video peripherals.)	Teaching of agricultural knowledge and skills • Proportion of users • Frequency of use	Linear regression analysis
$H0_3$Extension institutional characteristics have no statistically significant influence on use of VMT for dissemination of agricultural knowledge and skills by extension agents in Homa-Bay County.	Extension institutional characteristics (financial support, technical support, training services)	Use of Video Mediated Technology • Proportion of users • Frequency of use	Linear regression analysis
$H0_4$Extension environment characteristics have no statistically significant influence on use of VMT for dissemination of agricultural knowledge and skills by extension agents in Homa-Bay County.	Extension environment characteristics (availability of electricity, training centres and accessibility)	Use of Video Mediated Technology • Proportion of users • Frequency of use	Linear regression analysis

CHAPTER FOUR
RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the results of this study based on formulated objectives and hypotheses as presented in Chapter One. The study investigated the factors influencing the use of video mediated technology for teaching of agricultural knowledge and skills by public extension agents in Homa-Bay County, Kenya. In analyzing the research data, descriptive and inferential statistical methods were used. The variable indicators were then operationalized into an index and scored on a rating scale. The internal reliability of the created indices were determined using Cronbach's alpha (α) and an alpha of above 0.7 was considered adequate for this study. The results are presented and the findings are discussed in relation to other studies as given in the following sections. The chapter is divided into seven sections, as follows: introduction, characteristics of extension agents in Homa Bay County, Use of VMT by extension agents, influence of extension agents' personal characteristics, influence of VMT characteristics, influence of institutional characteristics, and influence of extension environment characteristics.

4.2 Characteristics of Extension Agents in Homa-Bay County

Three attributes of the extension agents in the study area, which were considered important to this study are discussed in this section, they include: Gender of the respondents, professional qualifications, and age of the respondents.

4.2.1 Gender of the Extension Agents

Gender may influence decision making especially in matters concerning adoption and use VMT by extension agents. The research instrument contained items to collect information about gender of the respondents. The percentage distribution of the respondents' response about their gender is shown in Figure 3.

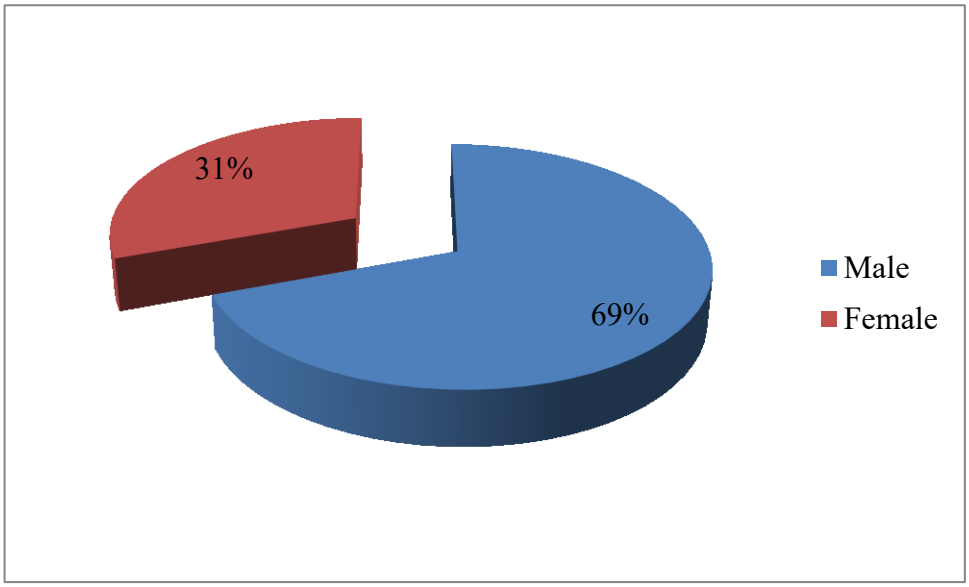

Figure 3: Distribution of Respondents by Gender

The results show that out of 85extension agents who responded, 69 percent were male and 31 percent were female. This sample population compares well with the national figures. The 31 percent female extension agents are within the Kenyan constitution gender threshold in enhancing gender equity rule in public institutions and occupation. The findings of this study are consistent with those of Kilonzo and Ikamari (2015) in the Ministry of State in the office of the President and Ministry of Higher Education, which found out that there were 60 percent males and 30 percent females hence was in line with the implementation of affirmative action policy.

4.2.2 Professional Qualifications of the Extension Agents

Professional qualification was included in the study because the researcher wanted to understand the level of education of all the respondents. Education as an independent variable enables an individual to receive and utilize new ideas and approaches and to rationally apply the knowledge to improve the quality of information delivery service. The expectation is that higher level of education of the respondents would influence their capacity to use VMT to disseminate agricultural knowledge and skills when teaching farmers.The extension agents were asked to state the highest professional qualification they had attained, then the responses were grouped into three categories as Diploma, Bachelor degree, Master degree and PhD. The frequency distribution and percentages of the professional qualification attained by respondents is shown in Table 3.

Table 3

Highest professional qualifications attained by the extension agents

Highest Professional Qualifications	Frequency	Percent of Agents
Diploma	52	61.2
Bachelor Degree	30	35.3
Master Degree	2	2.4
PhD	1	1.2
Total	85	100.0

Analysed data shows that majority of the respondents 61.2 percent had attained the Diploma level of professional training, while 35.3 percent had a Bachelor degree, 2.4 percent had a Master degree and 1.2 percent had a PhD.

A similar study done by Tata and McNamara (2017) identified low education levels as one of the factors affecting adoption and use of new technologies in extension service delivery. In their study, it was also revealed that majority of the agricultural extension agents in public sectors were diploma holders which corresponds to the findings of this study. Their finding showed that extension officers with advanced degrees faced less technical challenges using information communication technologies than their less educated colleagues. The finding of Okello et al. (2014) revealed that literacy level as a human capital and a factor, influences decision making by an individual to adopt and use ICT-based agricultural services among extension agents. The idea is that, a unit increase in extension agent's level of education increases the likelihood of a decision and exposure to use ICT-based Agricultural Practices Information (APIS), hence, low levels of education has a direct influence on the use of VMT (Agbo, 2015). However, the study also reveals that the entire respondents had one educational qualification or the other and were therefore literates and could utilize VMT to improve their work.

4.2.3 Age of the respondent

The extension agents were asked to state the year they were born as indicated in their identity card. The age of the respondent was then calculated and the results are shown in Figure 4.

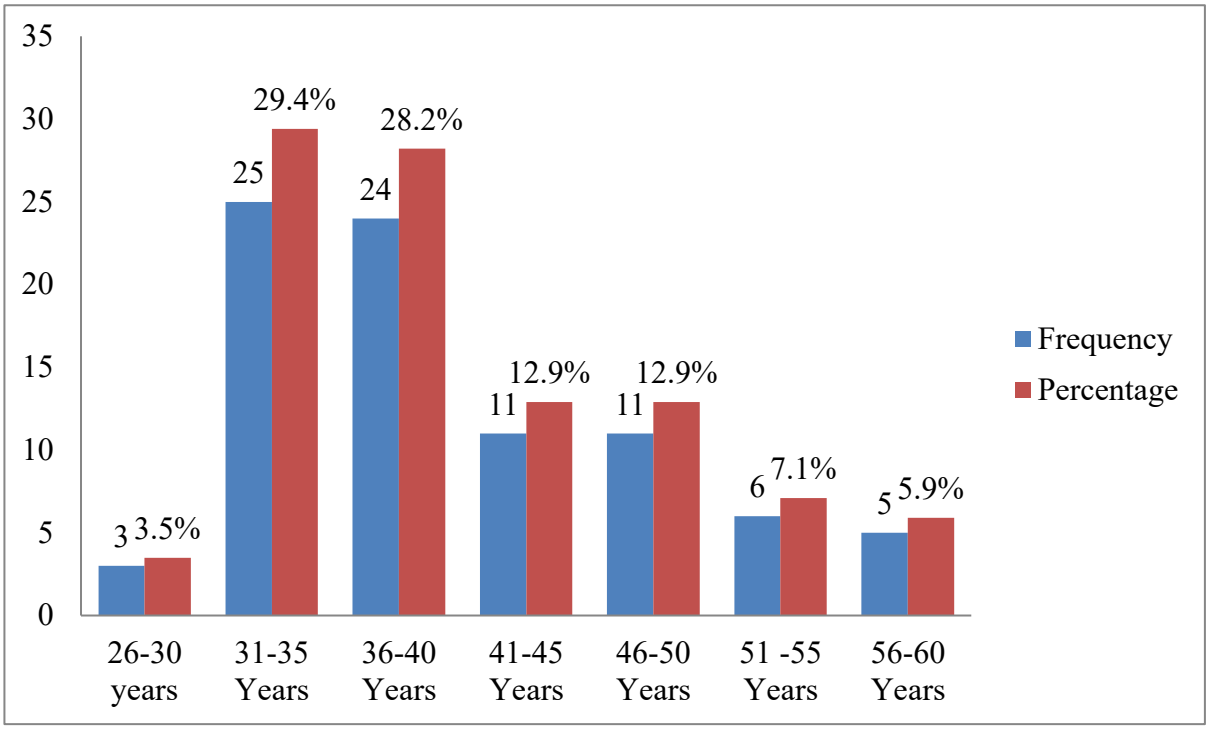

Figure 4: Age Distribution of the Respondents

The mean age of the respondents was 38 years. The results indicate that the youngest age group (26-30) years old constituted a frequency of 3.5 percent of the respondents; while those who were 31-35 years of age constituted the highest frequency as 25 (29.4%), followed by 36-40 years of age which constituted the second highest frequency as 24 (28.2%). The respondents above 55 years were 5.9 percent. The study therefore shows that a majority of the respondents were relatively young and in their middle ages. This implies high capacity to take decision on the use of VMT. This trend may have significant implication for VMT usage since the elderly might be less interested in using hi-tech communication devices and prefer oral and printed information channels, which are less efficient. In a similar study, Alfaz, Alsubaie and Mirza (2016) found out that the age of individuals affect their mental attitude towards new ideas and hence influence adoption in several ways. As the age of respondents' increase, their attitude towards use of ICTs becomes negative, conversely indicating a positive from young respondents (Alfaz, Alsubaie & Mirza, 2016). Young people can adopt new technologies and techniques more swiftly and they show more energetic behaviour to overcome challenges as compared to older adults. Hence, the differences in the respondents' age were of less significance.

4.3 Use of Video Mediated Technology by Extension Agents

The dependent variable of this study wasthe use of video mediated technology for teaching of agricultural knowledge and skills by public extension agents in Homa Bay County, Kenya. The variable was operationalized as an index involving three different indicators, which included Use of VMT by the extension agents, frequency of use of VMT by the extension agents and the choice of VMT by the extension agents in relation to other extension methods. The index was then used as the dependent variable and in testing of the study hypothesis.

4.3.1 Level of use of VMT by extension agents in Homa-Bay County

The level of use of VMT was conceptualized using three main indicators: use of VMT by extension agents based on gender, frequency of use of VMT by extension agents and the choice to use VMT compared to other extension methods. The descriptive statistics on level of use of VMT are shown in Figure 5, Table 4 and Table 5.

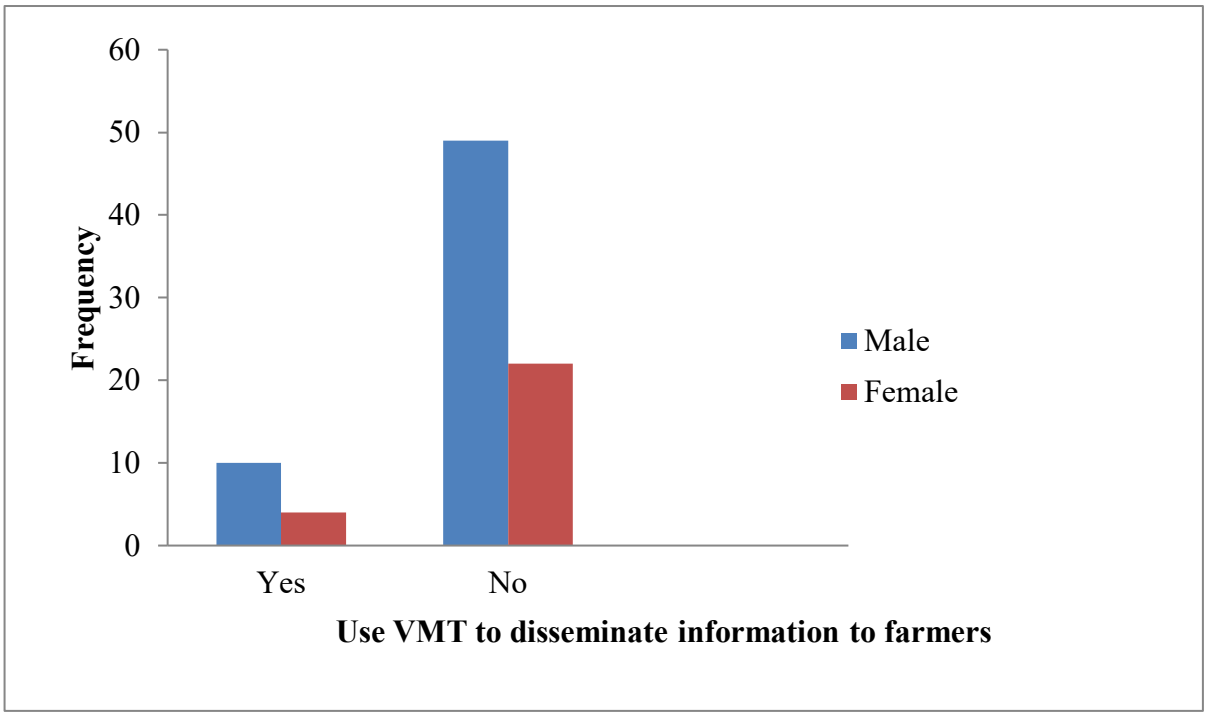

Figure 5: Distribution of Respondents by gender on use of VMT to disseminate agricultural information to farmers

The results in figure 5 show that out of the 59 male extension agents, only 10 (16.95%) used videos while the other 49 (83.05%) did not use the technology. On the side of the female extension agents, only 4 (15.38%) used the technology while the remaining 22 (84.62%) did not use videos to disseminate agricultural information and skills to farmers. Majority of

extension agents did not use the technology indicating low use of VMT in disseminating agricultural information and skills to farmers. It was anticipated that the respondents' gender would influence their ability and decision to use VMT in dissemination of agricultural information and skills to farmers. The findings of this study contends that of Tata and McNamara (2017b) that indicated that challenges faced by extension officers in adopting technology in Kenya included gender which had an impact on the use of farm book technology and on extension service delivery.

Table 4

Frequency of use of VMT by the Extension Agents in a month

Frequency of use	Frequency	Percent
Not used	13	15.3
Slightly used (once)	48	56.5
Moderately used (twice per month)	13	15.3
Highly used (thrice per month)	8	9.4
highly used (four times per month)	3	3.5
Total	85	100.0

N=85

The results presented in Table 4 indicate that majority of the respondents, 48 (56.5%) slightly used the VMT, 15.3 percent showed moderate use, while 12.9 percent indicated high use and those who did not use the technology were 15.3 percent.

Table 5

Extension Agents' choice to use VMT compared to other Extension Methods

Responses	Frequency	Percent
Not at all	13	15.3
Rarely	46	54.1
Sometimes	13	15.3
Most times	8	9.4
Always	5	5.9
Total	85	100.0

N=85

From the results showed in Table 5 on choice to use VMT by respondents compared to other extension methods, majority of extension agents, 46 (54.1%) rarely chose to use VMT, those who occasionally (sometimes) chose to use the technology were 15.3 percent, while those who always used it were 5.9 percent. Those extension agents who did not choose to use it at all were 15.3 percent.

The results obtained from the extension agents' responses to use of VMT based on gender, frequency of use of VMT and their choice to use VMT compared to other extension methods indicated low level of use of VMT in dissemination of agricultural information and skills to farmers. The findings of this study corresponded to those obtained by Sulaiman et al. (2015) which showed low use of video mediated teaching and learning among the public extension agents. Their study identified age, level of education, attitude and awareness of both extension agents and farmers as the determinants to use of videos in dissemination of agricultural technologies among farmers. In a related study, Adewale and Ganiyu (2013) identified accessibility, availability and infrastructural facilities as some of the factors that use of an ICT-based technology would depend on. The finding of Tata and McNamara (2017) also revealed that gender, technical support, cost of equipment, internet connectivity, availability of electricity had great influence on the use of ICT-based technologies. Therefore, it can be deduced that the use of VMT depends on four major factors that can be broadly categorized as extension agents' personal characteristics, VMT characteristics, extension institutional characteristics and extension environment characteristics.

4.4 Influence of Extension Agents Personal Characteristics on the Use of VMT

The first objective of this study was to determine whether extension agents' personal characteristics (working experience, competence, attitude and level of awareness) influence their ability to use VMT for disseminating of agricultural information and skills to farmers in Homa Bay County.

4.4.1 Extension agents' personal characteristics

In this study the influence of four extension agents' personal characteristics on the use of VMT were assessed, these included working experience, competence in use of VMT, attitude and level of awareness.

Working Experience of extension agents

The study conceptualized the variable experience of extension agents as the number of years worked in advising farmers. The extension agents were asked to state the period they had worked in years, the frequency distribution and the descriptive statistics are shown in Figure 6

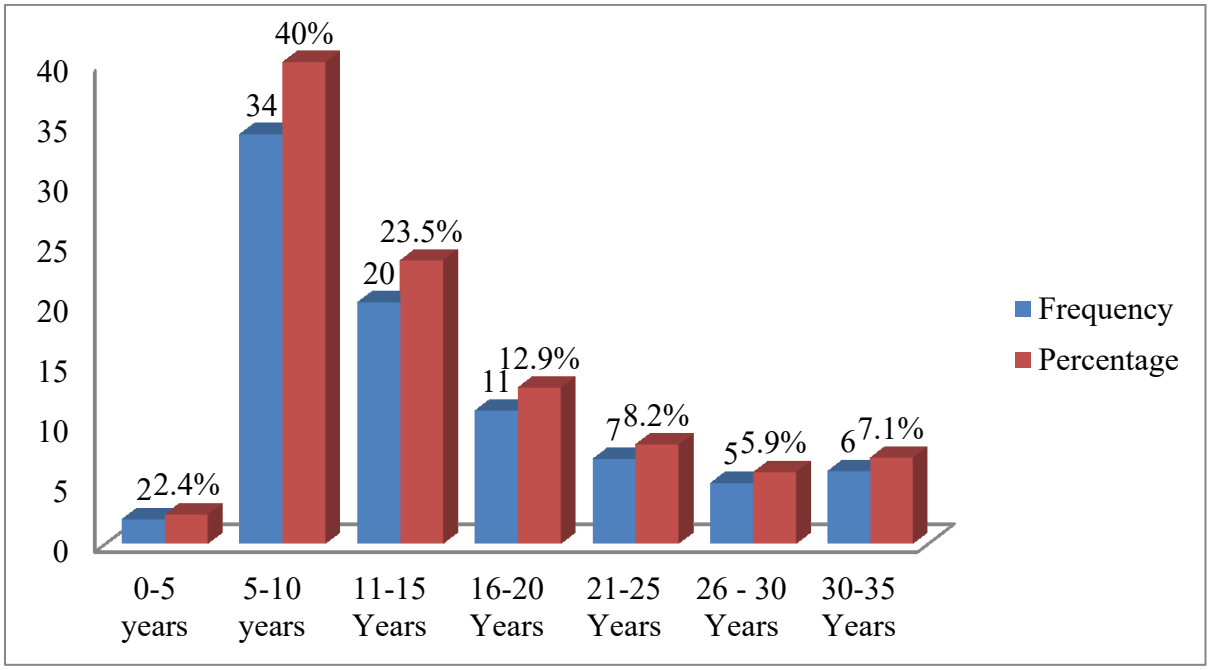

Figure 6: Extension Agents Working Experience

Findings of descriptive analysis shows that majority (40 %) of the extension agents had worked for a period of between 5 and 10 years. The average period worked was 14 years and the maximum was 33 years. Even though majority of the extension agents were relatively young and had worked for a short period, their responses indicated that, they did not adequately use VMT in disseminating relevant agricultural information and farming skills to farmers.

This phenomenon was contrary to normalcy that many young and newly employed officers are much exposed, anxious and aggressive to explore and employ new technologies than the elderly ones to aid their work especially those that are ICT-based. The findings of this study contends that of Yakubu et al. (2013b) which in a related study concluded that extension workers with more working experience are more likely to adopt the ICTs than those with less working experience. Therefore, working experience of extension agents as revealed in this study had no significant influence on use of VMT.

Competence level of Extension agents in the use of VMT

The level of competence of the extension agents' use of VMT was looked at from five indicators; they included competence in the use of white board, overhead projector, video clips in training farmers, computers for personal work and in teaching, internet in consulting bloggers from various agricultural websites respectively and preparation of videos for teaching.

Table 6

Extension Agents' Responses to Competence levels on use of VMT

		Responses from the Extension Agents					
Statement/item		Very Low	Low	Moderate	High	Very High	Total
Use of whiteboard to train	F	38	45	2	0	0	85
farmers	%	44.7	52.9	2.4	0	0	100
Use of overhead projectors to	F	77	8	0	0	0	85
train farmers	%	90.6	9.4	0	0	0	100
Sourcing video clips from	F	43	42	0	0	0	85
internet for use	%	50.6	49.4	0	0	0	100
Preparing videos for teaching	F	81	4	0	0	0	85
farmers locally	%	95.3	4.7	0	0	0	100
Use of computers to assist with	F	16	61	8	0	0	85
class work teaching	%	18.8	71.8	9.4	0	0	100
Use of computer for personal	F	16	57	10	2	0	85
work in lesson preparation	%	18.8	67.1	11.8	2.4	0	100
Showing videos to farmers	F	72	12	1	0	0	85
during training	%	84.7	14.1	1.2	0	0	100
Consulting with bloggers on	F	79	5	0	1	0	85
available agricultural videos	%	92.9	5.9	0	1.2	0	100

N=85

The results shown in Table 6 indicates that the level of competence of majority of extension agents to use of VMT ranged between very low and Low with a few respondents rating their competence level as moderate.

Table 7

Descriptive statistics on competence levels of Extension Agents on use of VMT

Statement/item	Statistics					
	N	Sum	Mean	Std. Dev.	Min.	Max.
Use of whiteboard to train farmers	85	134	1.577	.543	1	3
Use of overhead projectors to train farmers	85	93	1.094	.294	1	2
Sourcing video clips from internet for use	85	127	1.494	.503	1	2
Preparing videos for teaching farmers locally	85	89	1.047	.213	1	2
Use of computers to assist with class work teaching	85	162	1.906	.526	1	3
Use of computer for personal work in lesson preparation	85	168	1.977	.636	1	4
Showing videos to farmers during training	85	99	1.165	.404	1	3
Consulting with bloggers on available agricultural videos	85	93	1.094	.397	1	4

N=85

The descriptive statistics for competence level is presented in Table 7. The results indicate a minimum index of 1 and a maximum of 4. Low index is associated with low competence levels. Majority of extension agents had a minimum score of one, therefore indicating low competence level to use of VMT in disseminating agricultural information and skills to farmers in Homa Bay County. The findings of this study corresponds to that of Emmelyn, Marjolijn, Alexander and Emiel (2018) which identified low competence levels as a social factor in video-mediated communication among farmers and extension workers.

Extension agents' attitude towards VMT use

The attitude of the extension agents towards VMT was operationalized as an index which combined scores from eleven (11) indicators. This study sought perception of respondents on importance of using white boards, time required to prepare videos, use of video to simplify concepts, capture farmers' attention, motivate and excite farmers to learn, operation of overhead projectors, learning about computer, challenges to learning of computer, use of video as a supplement and results yielded by using videos in teaching respectively. The result is shown in Table8.

Table 8

Extension Agents' Responses to attitude towards use of VMT

		Responses from the Extension Agents					
Statement/item		Not useful	Slightly useful	Moderately useful	Useful	Highly useful	Total
Using whiteboard to write and explain points to farmers during trainings	F	3	2	10	60	10	85
	%	3.5	2.4	11.8	70.6	11.8	100
Preparing video materials locally for teaching of farmers	F	21	58	4	2	0	85
	%	24.7	68.2	4.7	2.4	0	100
Playing video clips to elaborate and clarify abstract concepts to farmers	F	0	73	11	11	1	85
	%	0	85.9	12.9	12.9	1.2	100
Using video to capture the attention of farmers during trainings	F	0	56	29	0	0	85
	%	0	65.9	34.1	0	0	100
Incorporating videos to motivate and excite farmers to learn successfully	F	0	70	15	0	0	85
	%	0	82.4	17.6	0	0	100
Employment of overhead projectors to aid in viewing of videos during learning sessions	F	0	61	17	6	1	85
	%	0	71.8	20.0	7.1	1.2	100
Using computers to facilitate learning	F	52	30	0	3	0	85
	%	61.2	35.3	0	3.5	0	100
Acquiring basic computer skills for its use by extension agents	F	0	2	75	7	1	85
	%	0	2.4	88.2	8.2	1.2	100
Embracing challenges to use of videos for successful learning	F	51	29	4	0	1	85
	%	60.0	34.1	4.7	0	1.2	100
Applying VMT to supplement the existing extension methods	F	0	0	14	71	0	85
	%	0	0	16.5	83.5	0	100
Training farmers through videos to yield better and more permanent learning outcomes	F	0	0	25	57	3	85
	%	0	0	29.4	67.1	3.5	100

N=85

The frequency and percentage distribution of the attitude of extension agents to use of VMT is presented in Table 8. The results indicate poor attitude with majority citing the use of VMT items as either not useful, slightly use or moderately useful. However, the use of whiteboards to write and explain points to farmers during trainings, application of VMT to supplement the existing extension methods and training farmers through videos were cited as useful by most of the respondents in yielding better and more permanent learning outcomes to farmers. The findings of this study corresponds to that of Alfaz, Alsubaie and Mirza (2016) which revealed poor attitude among the agricultural extension workers towards use of E-extension in ensuring sustainability of agricultural information dissemination to farmers.

Extension agents' Level of Awareness

The extension agents' level of awareness of the VMT was conceptualized as an index that studied eight (8) indicators which symbolized the awareness of the individual towards the existence of VMT as an innovation and its usefulness in training farmers. The agents self-rated their awareness of the different aspects of VMT use on a 5-point scale.

The results in Table 9 show that majority of the extension agents had their level of awareness to use of VMT ranging between Very low to low with only a few rating their level of awareness as moderate. The findings of this study corresponds to that of Msoffe and Ngulube (2016) which indicated low level of awareness as a factor influencing agricultural information dissemination in rural areas of developing countries. Regression analysis was subsequently used to determine the influence of agents' characteristics on the use of VMT.

Table 9

Extension Agents' Responses to awareness on use of VMT

Statement/item		Responses from the Extension Agents					
		Very Low	Low	Moderate	High	Very High	Total
Use of whiteboard to train farmers	F	38	45	2	0	0	85
	%	44.7	52.9	2.4	0	0	100
Use of overhead projectors to train farmers	F	77	8	0	0	0	85
	%	90.6	9.4	0	0	0	100
Sourcing video clips from internet for use	F	43	42	0	0	0	85
	%	50.6	49.4	0	0	0	100
Preparing videos for teaching farmers	F	81	4	0	0	0	85
locally	%	95.3	4.7	0	0	0	100
Use of computers to assist with class work	F	16	61	8	0	0	85
teaching	%	18.8	71.8	9.4	0	0	100
Use of computer for personal work in	F	16	57	10	2	0	85
lesson preparation	%	18.8	67.1	11.8	2.4	0	100
Showing videos to farmers during training	F	72	12	1	0	0	85
	%	84.7	14.1	1.2	0	0	100
Consulting with bloggers on available	F	79	5	0	1	0	85
agricultural videos	%	92.9	5.9	0	1.2	0	100

N=85

4.4.2 Influence of VMT Characteristics on its Use by Extension Agents

The second objective of this study was to determine whether VMT characteristics (availability and dependence) influence its use for teaching of agricultural knowledge and skills by public extension agents in Homa-Bay County.

4.4.3 Availability and reliability of VMT

The variable video characteristic for this study was conceptualized as an index involving two indicators, which included availability and the reliability on the videos in disseminating agricultural information and skills to farmers.

Availability of VMT

The availability of VMT was conceptualized by asking the extension agents to state the availability of ten VMT items used in teaching farmers agricultural knowledge and skills in Homa-Bay. The respondents rated the availability of these VMT items on a 5-point scale: 0 not available and 5 highly available. The responses of extension agents on availability of VMT are as shown in Table 10.

Table 10

Availability of Video Instructional Resources

		Responses from the Extension Agents					
Statement/item		Not available	Slightly available	Moderately available	Available	Highly available	Total
Whiteboards	F	42	41	1	1	0	85
	%	49.4	48.2	1.2	1.2	0	100
Flipcharts	F	3	10	17	55	0	85
	%	3.5	11.8	20.0	64.7	0	100
Overhead projectors	F	79	6	0	0	0	85
	%	92.9	7.1	0	0	0	100
Videos	F	78	7	0	0	0	85
	%	91.8	8.2	0	0	0	100
Computers	F	21	62	0	2	0	85
	%	24.7	72.9	0	2.4	0	100
DVD/CD players	F	77	7	0	1	0	85
	%	90.6	8.2	0	1.2	0	100
Television screen	F	81	3	0	1	0	85
	%	95.3	3.5	0	1.2	0	100
Agricultural videos	F	74	10	0	1	0	85
in DVDs and CDs	%	87.1	11.8	0	1.2	0	100
Digital camera(s)	F	75	8	0	2	0	85
	%	88.2	9.4	0	2.4	0	100
Internet access	F	73	12	0	0	0	85
points	%	85.9	14.1	0	0	0	100

N=85

The findings indicate that Video instructional resources are either not available or the ones that are available are very few in numbers. However, flipcharts were available for use by the

extension agents, an indication that it is what is commonly used during training of farmers and not videos.

Reliability of the VMT

The reliability on VMT was conceptualized by asking the extension agents to rate the reliability of the ten VMT items to disseminate information and skills to farmers in Homa-Bay County. The respondents rated the reliability of these VMT items on a 5-point scale: 0 not reliable and 5 highly reliable. The result is shown in Table 11

Table 11

Reliability of the VMT items

		Responses from the Extension Agents					
Statement/item		Not reliable	Slightly reliable	Moderately reliable	Reliable	Highly reliable	Total
Whiteboards	F	42	41	1	1	0	85
	%	49.4	48.2	1.2	1.2	0	100
Flipcharts	F	3	10	17	55	0	85
	%	3.5	11.8	20.0	64.7	0	100
Overhead projectors	F	79	6	0	0	0	85
	%	92.9	7.1	0	0	0	100
Videos	F	78	7	0	0	0	85
	%	91.8	8.2	0	0	0	100
Computers	F	21	62	0	2	0	85
	%	24.7	72.9	0	2.4	0	100
DVD/CD players	F	77	7	0	1	0	85
	%	90.6	8.2	0	1.2	0	100
Television screen	F	81	3	0	1	0	85
	%	95.3	3.5	0	1.2	0	100
Agricultural videos	F	74	10	0	1	0	85
in DVDs and CDs	%	87.1	11.8	0	1.2	0	100
Digital camera(s)	F	75	8	0	2	0	85
	%	88.2	9.4	0	2.4	0	100
Internet access	F	73	12	0	0	0	85
points	%	85.9	14.1	0	0	0	100

N=85

From the results in Table 11, majority of the extension agents cited the reliability of the video items as either not reliable or slightly available. This indicates that one cannot depend upon these video instructional resources whenever he or she chooses to use one, a factor contributed to by the unavailability of these items or the items being too few to meet the demands of each extension agent for use. However, flipcharts were more reliable owing to the fact that they were ever available for use by the extension agents. Regression analysis was subsequently used to determine the influence of VMT characteristics on the use of VMT by extension agents.

4.5 Influence of Institutional Characteristics on the Use of VMT

The third objective of this study was to determine whether extension institutional characteristics (technical support, training, financial support, internet installations and availability of training rooms) had influence on use of VMT for teaching of agricultural knowledge and skills by public extension agents in Homa-Bay County.

4.5.1 Extension institutional characteristics

The variable extension institutional characteristics used in this study were conceptualized as an index involving assessment of ten indicators of good extension institutions. The indicators were rated on a 5-point scale to gauge their provision by the institution. The extension institution indicators that were used included: (i) availability of videos with the right content, (ii) in-service training for staff on VMT, (iii) Guidance in the use of VMT, (iv) Freedom of access and use of VMT, (v) adequate VMT resources, (vi) Maintenance of VMT resources in good working conditions, (vii) Availability of power, (viii) Furnished training centre, (ix) Good internet connectivity, and (x) collaboration with other global organizations in use of VMT. The result is shown in Table 12.

The results presented in Table 12 indicate that various agricultural extension institutions lacked videos with the right content for training of farmers, technicians to guide staff on use of various VMT resources and fix technological hiccups that normally arise during trainings. Well-furnished training or resource centres were unavailable, as well as internet connections and a stable source of power. Moreover, the result indicates lack of freedom to access and use video resources at will and lack of collaborations between various agricultural institutions and other global organizations to share agricultural ideas, knowledge and skills.

Table 12
Extension Institutional Characteristics

Statement		Responses from the Extension Agents					
		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	Total
Videos with the right content are readily available in our institution	F	65	16	1	2	1	85
	%	76.5	18.8	1.2	2.4	1.2	100
The administration always organize for in-service training to staff on emerging instructional technologies	F	8	28	1	47	1	85
	%	9.4	32.9	1.2	55.3	1.2	100
There is a technician employed to assist and guide staff on use of instructional technologies	F	76	8	0	1	0	85
	%	89.4	9.4	0	1.2	0	100
There is freedom to access and use video resources anytime I want	F	19	60	4	2	0	85
	%	22.4	70.6	4.7	2.4	0	100
There are adequate video resources for all the staff in our institution	F	33	52	0	0	0	85
	%	38.8	61.2	0	0	0	100
Video resources are available but not in working conditions	F	65	14	2	1	3	85
	%	76.5	16.5	2.4	1.2	3.5	100
There is a stable source of power to support use of video in the place where I work	F	12	62	0	8	3	85
	%	14.1	72.9	0	9.4	3.5	100
There is a well-furnished training centre within the region where I work owned by the government	F	72	13	0	0	0	85
	%	84.7	15.3	0	0	0	100
Internet connection is available for use to source for agricultural training videos in our institution	F	69	16	0	0	0	85
	%	81.2	18.8	0	0	0	100
My institution collaborates with other global organizations to access and share agricultural videos on different farming enterprises	F	11	67	2	5	0	85
	%	12.9	78.8	2.4	5.9	0	100

N=85

The findings of this study corresponds to that of Muriithi, Horner and Permberton (2016) which cited institutional features such as lack of access, freedom, guidance and unavailability as factors contributing to low adoption and use of information and communication technologies within research collaborations in Kenya. Regression analysis was subsequently used to determine the influence of extension institution characteristics on the use of VMT by extension agents.

4.6 Influence of Extension Environmental Characteristics on Use of VMT by Agents

The fourth objective of this study was to examine the influence of extension environment characteristics (availability of electricity, responsiveness of the farmers to VMT and accessibility to the training centres) on use of VMT for teaching of agricultural knowledge and skills by public extension agents in Homa Bay County.

4.6.1 Extension environment characteristics

The variable extension environment characteristics used in this study was conceptualized as an index involving assessment of three (3) indicators of good extension environment. The indicators were rated on a 5-point scale to gauge the condition of the environment. The extension environment indicators that were used included: (i) availability of electricity away from training centre, (ii) responsiveness of the farmers to VMT, and (iii) accessibility of the centres based on distance. The results are shown it Tables 13, 14, 15, 16 and 17.

Table 13

Availability of other sources of power outside the institution to support use of Video

Availability	Frequency	Percent
No	79	92.9
Yes	6	7.1
Total	85	100.0

N=85

The results presented in Table 13 shows that majority of extension agents (92.9%) mentioned lack of other sources of power while a few (7.1%) cited availability of other sources of power in the local areas where they discharge extension services to farmers. These other sources of power other than electricity may include solar energy or powered generators.

Table 14

Availability of rooms for training and viewing of videos in the areas of work

Response	Frequency	Percent
No	80	94.1
Yes	3	3.5
Not sure	2	2.4
Total	85	100.0

N=85

The findings presented in Table 14 indicates that 94.1 percent of the extension agents cited lack of rooms where farmers can be trained and view videos within the local areas, while 3.5 percent mentioned the availability of rooms where as 2.4 percent were not sure.

Table 15

Extension Agents' rating of Farmers Responsiveness to training using ICT tools

Responsiveness	Frequency	Percent
Very high	16	18.8
High	63	74.1
Average	6	7.1
Total	85	100.0

N=85

Table 15 shows the ratings of extension agents to farmers' responsiveness to training using ICT tools. The findings indicate that 74.1 percent rated farmers' responsiveness as high while 18.8 percent rated as very high and 7.1 percent as average. These study results points out the importance of integrating ICTs into farmer trainings by extension agents to reinforce learning and bring out more permanent and memorable training outcomes and experiences that can be used to improve agricultural productivity by farmers.

Table 16

Extension Agents' rating of Agricultural information accessibility by Farmers based on Distance from extension offices

Accessibility	Frequency	Percent
Very good	1	1.2
Good	7	8.2
Average	54	63.5
Poor	18	21.2
Very poor	5	5.9
Total	85	100.0

N=85

Table 16 shows extension agents' rating of farmers' access to agricultural information based on distances from their homes to agricultural extension offices. The findings indicate that majority, 63.5 percent rated the accessibility as average, 21.2 percent rated as poor, 5.9 percent as very poor where as 8.2 percent as good and 1.2 percent gave their ratings as very good.

Table 17

Suggested Ways by extension agents to improve Agricultural use of VMT

Suggested Ways	**Frequency**	**Percent**
Government to avail video materials in local language	31	36.5
Training of extension officers on production and use of videos locally	19	22.4
Establishment of agricultural resource centres	31	36.5
Installation of internet connectivity in offices	2	2.4
Installation of electricity in ward agricultural offices	2	2.4
Total	85	100.0

N=85

Table 17 shows the suggested ways by extension agents to improve agricultural use of VMT. The findings indicate that 36.5 percent identified provision of both video materials in local languages by the government to extension agents and establishment of agricultural resource centres in various agricultural zones, while 22.4 percent mentioned training of extension agents

on how to develop training videos locally and 2.4 percent cited installation of both internet and electricity to various agricultural offices to support use of VMT. Regression analysis was subsequently used to determine the influence of extension environment characteristics on the use of VMT by extension agents.

4.6.2 Test of Hypothesis One

The study hypothesis was: There is no statistically significant influence of extension agent's characteristics on the use VMT by the extension agents in Homa-Bay County.

4.6.3 Influence of individual personal characteristics on the use of VMT

The influence of the individual personal characteristic (working experience, competence, attitudes and level of awareness) on the use of VMT by extension agents was determined by use of multiple linear regression and the results are shown in Table 18.

Table 18

Regression coefficients of the individual agent's characteristics and use of VMT

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-25.840	4.196		-6.158	.001
	Experience	.011	.025	.033	.431	.668
	Competence	.581	.097	.478	5.994	.001
	Attitude	.555	.106	.431	5.256	.001
	Awareness	.761	.104	.626	7.316	.001

a. Dependent Variable: use of VMT by extension Agents

Significant positive influences on the use of VMT by the extension agents were found in Extension agents' competence (β=.478, p=.001), attitudes (β=.431, p=.001) and awareness (β=.626, p=.001) were found to exist in the study. Working experience was found to have no significant influence (β=.033, p= .668) on the use of VMT by extension agents.

The results in Table 18 indicate that majority of the extension agents showed low competency level, negative attitude and low level of awareness to use of VMT as an extension approach in

disseminating relevant agricultural knowledge and skills to farmers. The findings suggest extension agents' personal characteristics as a factor that contributes to low use of VMT as indicated in Figure 5. For extension agents to effectively adopt the use of VMT in disseminating agricultural knowledge and skills to farmers, competency in operating video materials such as computers, overhead projectors and installations of the gadgets among others is necessary. In addition to competency, positive attitude and awareness towards the use, availability and perceived advantage of using VMT over other existing agricultural extension approaches will enhance its use and adoption among the extension agents in disseminating relevant technologies to farmers. Individuals with experience on how to use VMT resources such as computers, overhead projectors and digital cameras among others are well informed about the useful applications and benefits of VMT as compared with those without experience. It could be assumed from the results that these attributes are ineluctable for extension workers to develop perceived importance and agreement towards the use of VMT.

Bivariate linear regression analysis was used to determine the influence of extension agent's characteristics on the use of VMT. The index of use of VMT by extension agents formed the dependent variable, while the index of extension agents' characteristics the independent variable. The results of the regression model are presented in Table 19.

Table 19

Regression Model Summary for extension agents' characteristics

Model	R	R square	Adjusted R square	Standard error of the estimate
1	.740[a]	.548	.543	1.756

[a] predictors: (constant), index of use of VMT

The model indicates an adjusted R^2 value of 0.543, this means that the independent variable: extension agent's characteristics explained approximately 54.3 percent of the variation in dependent variable: use of VMT by extension agents. The regression coefficients of the model showing the beta, t statistics and the tolerance levels are given in Table 20.

Table 20

Regression Coefficients for extension agents' characteristics

	Unstandardized Coefficients		Standardized Coefficients			
Model	B	Std. Error	Beta	t	Sig.	VIF
(Constant)	-25.814	2.944		-8.768	.000	
Agents' characteristics	10.703	1.067	.740	10.035	.001	1.000

a. Dependent Variable: Use of VMT by extension agents

The bivariate linear regression analysis indicates that extension agents' characteristics has a positive and significant influence (β= .740, p=.001) on the use of VMT by the extension agents in Homa-Bay County. Therefore, the null hypothesis is rejected and it is concluded that extension agent's characteristics influences the use of VMT significantly.

The results are in line with a study by Kafyulilo, Fisser and Voogt (2015) which showed that personal characteristics such as low level of competence, poor attitude or beliefs and lack of awareness among other factors, affected the use of technologies in information communication. Concerning awareness, Msoffe and Ngulube (2016) in assessing agricultural information dissemination in rural areas suggested that decision to adopt and use an information communication technology is greatly influenced by the amount of information that the intended user has on the technology.

On attitude, the findings of Agbo (2015) in a study to determine factors influencing the use of information and communication technology by teachers in teaching and learning computer studies revealed that attitude had a significant influence on the adoption and use of technologies. In a related study by Ragasa et al. (2016) to assess factors affecting performance of agricultural extension, the study showed that low competency levels among extension agents existed as a factor that hindered their effective use of new agricultural information communication technologies. It is therefore, concluded that, the three attributes combined; competence, awareness and positive attitude are crucial factors that will positively influence extension agents' decision making towards adoption and use of VMT to disseminate necessary agricultural knowledge and skills to farmers in Homa-Bay County.

4.6.4 Test of Hypothesis Two

The study hypothesis was that there is no statistically significant influence of VMT characteristics on the use VMT by the extension agents in Homa Bay County. Bivariate linear regression analysis was used to determine the influence of VMT characteristics on the use of VMT by extension agents. The index of use of VMT by extension agents formed the dependent variable, while the index of VMT characteristics the independent variable. The results of the regression model are presented in Table 21.

Table 21

Regression summary for the influence of VMT characteristics on use of VMT by agents

Model	R	R square	Adjusted R square	Standard error of the estimate
1	.331[a]	.110	.109	2.465

[a] predictors: (constant), index of VMT Characteristics

The model indicates an adjusted R^2 value of 0.109; this means that the independent variable VMT characteristics explained approximately 10.9 % of the variation in dependent variable use of VMT by extension agents. The regression coefficients of the model showing the beta, t statistics and the tolerance levels are given in Table 22.

Table 22

Regression Coefficients for VMT characteristics

		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Model		B	Std. Error	Beta	T	Sig.	VIF
1	(Constant)	-1.653	1.685		-.981	.329	
	index of VMT characteristics	.182	.057	.331	3.201	.002	1.000

a. Dependent Variable: use of VMT by extension agents

The bivariate linear regression analysis indicates that VMT characteristics has a positive and significant influence (β= .331, p=.002) on the use of VMT by the extension agents in Homa-Bay County. Therefore, the null hypothesis is rejected and it is concluded that VMT characteristics influences the use of VMT significantly.

The results corroborate those of Kante, Oboko and Chepken (2017) which showed that adoption and use of information and communication technologies were largely affected by unavailability, unreliability and inaccessibility of the technology itself and also lack of infrastructural facilities. A similar study by Adewale and Ganiyu (2013) also supported these attributes as key actors in the adoption and use of a technology. Obasuyi and Okwilagwe (2016) argued that for a technology to be effectively exploited, it must first be available, reliable and within reach by the intended user. When respondents were asked to show whether the video resources were available, accessible and reliable for use or not, majority of them indicated that video resources were either unavailable or unreliable. Therefore, it can be concluded that lack of video resources and unreliability of these resources had a significant influence on the low use of VMT by extension agents in Homa-Bay County.

4.6.5 Test of Hypothesis Three

The study hypothesis was: There is no statistically significant influence of extension institution characteristics on the use VMT by the extension agents in Homa-Bay County. Linear regression analysis was used to determine the influence of extension institution's characteristics on the use of VMT by extension agents. The index of use of VMT by extension agents formed the dependent variable, while the index of extension institution characteristics formed the independent variable. The results of the regression model are presented in Table 23.

Table 23

Regression summary for the influence of institutional characteristics on use of VMT

Model	R	R square	Adjusted R square	Standard error of the estimate
1	.255[a]	.065	.054	2.526

[a] predictors: (constant), index of extension institutional characteristic

The model indicates an adjusted R^2 value of 0.054; this means that the independent variable extension institution characteristics explained approximately 5.4 % of the variation in dependent variable use of VMT by extension agents. The regression coefficients of the model showing the beta, t statistics and the tolerance levels are given in Table 24.

Table 24

Regression Coefficients for extension institutional characteristics

		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Model		B	Std. Error	Beta	T	Sig.	VIF
1	(Constant)	.258	1.444		.178	.859	
	index of institution characteristics	.202	.084	.255	2.407	.018	1.000

a. Dependent Variable: use of VMT by extension agents

The bivariate linear regression analysis indicates that extension institutional characteristics has a positive and significant influence (β= .255, p=.018) on the use of VMT by the extension agents in Homa-Bay County. Therefore, the null hypothesis is rejected and it is concluded that extension institution characteristics influences the use of VMT by extension agents significantly.

These results corroborates those of Muriithi, Horner and Pemberton (2016).They indicated that institutional characteristics such as availability of ICT teaching resources with relevant content, accessibility, management support, technical knowledge in operation were vital. Moreover, maintenance of ICT devices such as DVD, video, computers and digital cameras were equally important. Both factors contributed to low adoption rates and use of information and communication technologies within research collaborations in Kenya. In a related study, Musa, Githeko and El-Siddig (2013) indicated that lack of well-furnished training centres, stringent rules and regulation laid down by the institution's management to govern the use of these resources were limiting factors to use of ICTs to disseminate agricultural information to farmers by extension agents. Tata and McNamara (2016) in their study to determine constraints

affecting ICT utilization by agricultural extension officers showed that erratic and unstable electricity supply and less access to internet connectivity within agricultural institutions contributed to low adoption and use of information communication technologies. Majority of the respondents highlighted some of the institutional challenges as lack of video materials with relevant contents, electricity or power problems, poor maintenance and working conditions of VMT resources. Other challenges are inadequate video resources, poor internet connectivity, inadequate in-service training for staff on VMT and lack of furnished training centres and collaboration with other global organizations in use of VMT. These attributes therefore had a significant influence on use of VMT hence its low adoption and use by public extension agents in Homa-Bay County.

4.6.6 Test of Hypothesis Four

The study hypothesis was: There is no statistically significant influence of extension environment characteristics on the use VMT by the extension agents in Homa-Bay County.

Bivariate linear regression analysis was used to determine the influence of extension environment characteristics on the use of VMT by extension agents. The index of use of VMT by extension agents formed the dependent variable, while the index of extension environment characteristics formed the independent variable. The results of the regression model are presented in Table 25.

Table 25

Regression summary for the influence of environment characteristics on use of VMT

Model	R	R square	Adjusted R square	Standard error of the estimate
1	.215[a]	.046	.035	2.551

[a] predictors: (constant), index of extension environment characteristic

The model indicates an adjusted R^2 value of 0.035; this means that the independent variable extension environment characteristics explained approximately 3.5 percent of the variation in dependent variable use of VMT by extension agents. The regression coefficients of the model showing the beta, t statistics and the tolerance levels are given in Table 26.

Table 26

Regression Coefficients for extension environment characteristics

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics
Model	B	Std. Error	Beta	T	Sig.	VIF
(Constant)	6.391	1.381		4.627	.000	
extension environment	.515	.256	.215	2.010	.048	1.000

a. Dependent Variable: use of VMT by extension agents

The regression analysis indicates that extension environment characteristics has a positive and significant influence (β= .215, p=.048) on the use of VMT by the extension agents in Homa-Bay County. Therefore, the null hypothesis is rejected and it is concluded that extension environment characteristics influences the use of VMT by extension agents significantly. This finding is in line with the findings of Okello et al. (2014) which showed that environmental characteristics affects the likelihood of an extension agent to use a technology in place in disseminating relevant agricultural knowledge and skills to farmers. Akpabio, Okon and Inyang (2007) in their findings, specified lack of electricity and poor road networks as actors affecting dissemination of agricultural information to farmers in rural areas. In a similar study, Tata and McNamara (2017) indicated that how farmers would respond towards dissemination of agricultural information by extension agents in use of information and communication technologies is key in the sustainability of that particular technology and this would be greatly affected by their gender, age, level of education, social category and cultural beliefs. The findings of Muhammad et al. (2016) also revealed that farmers lived over far distances from agricultural centres and this affected information service delivery by extension agents to farmers in rural areas. Therefore, lack of electricity away from agricultural centres and inaccessibility of some parts in the rural areas had a direct influence towards low use of VMT by extension officers in various parts of Homa-Bay County.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter summarizes the findings and draws conclusions and recommendations for practice and for further research.

5.1 Summary of the Study

This study mainly focused on factors influencing use of video mediated technology for teaching of agricultural knowledge and skills by public extension agents in Homa-Bay County. Four aspects of the factors were examined namely; extension agents' personal characteristics such as competence, attitude and level of awareness, VMT characteristics such as availability and reliability. Extension institutional characteristics examined included aspects such as availability of videos with relevant contents, In-service training of staff on VMT, guidance in the use of VMT, freedom of access and use of VMT. Other feature are adequate VMT resources, maintenance of VMT resources in good working conditions, availability of power, furnished training centres, availability of good internet connectivity and collaboration with other global organizations in use of VMT. Lastly, the aspects of extension environmental characteristics studied involved availability of electricity away from the centre, response of farmers to teaching using VMT and accessibility of the agricultural centres based on distance from farmers' homes.

Data for this study was collected through a structured questionnaire, which was administered by the researcher to 85 respondents. The data were analyzed bearing in mind the objectives and hypotheses of the study. Both descriptive and inferential statistics were used in data analysis. Linear regression analysis was used to determine the influence of the factors considered on use of VMT by Public extension agents. The researcher conducted a linear regression test to examine whether there was statistically significant influence of the selected factors on use of VMT in disseminating agricultural information and skills to farmers. The results indicate the following: There is low use of VMT among the extension agents; there is low level of competence, awareness and poor attitude among the agents on VMT use; there is lack of adequate video materials and unreliability in the use of those materials; various institutions lack adequate videos with relevant content, sources of power, internet, in-service trainings and technicians; there is no resource centres and stable source of power within various local areas

of operation. In addition, the distances between farmers' homes and the offices are far and this could eventually limit accessibility for training of farmers by extension agents.

From the results obtained in this study, it is concluded that there is significant influence of extension agents' personal characteristics, VMT characteristics, institutional characteristics and extension environment characteristics on use of VMT for the dissemination of agricultural information and skills by public extension agents. Generally, inhibitory aspects of these factors directly or indirectly have a bearing on low adoption and use of VMT by the Public extension agents.

5.2 Conclusions

Based on the study findings, the study draws the following conclusions:

i) Extension agents' personal characteristics have an influence on use of VMT as exhibited by low competence, awareness and attitude among the agents. This would therefore, limit their ability to effectively exploit the technology in disseminating agricultural information and skills to farmers.

ii) There is a significant influence of video characteristic on its use as a technology in disseminating farm-based knowledge and skills to farmers. Lack of video resources and unreliability in use of videos exist and this has a direct bearing on low use of the technology among extension agents.

iii) There is lack of adequate video resources, videos with relevant content, furnished training centres, technicians for maintenance of VMT resources, and other sources of power like generators. There is also low access to internet connectivity, inadequate in-service trainings for staff on VMT, guidance in the use of VMT and lack of collaborations with other organizations in use of VMT hence negatively affecting use of VMT.

iv) There is an influence of extension environment on use of VMT. This was evident in the responses of majority of respondents that distances between the agricultural centres and farmers' homes are far and that some local areas where extension agents operate completely lacked sources of power.

5.3 Recommendations

Recommendations from the findings and conclusions of the study include:

i) The Extension agents should adopt use of VMT when they are training farmers. The findings of the study indicates that VMT adds value when training farmers. Extension agents should be encouraged to use VMT through exclusive in-service training programs and refresher courses to positively influence their attitude, boost their competence and expose them to emerging agricultural information communication technologies such as VMT.

ii) Public institutions in the agricultural sector should also be involved in developing a curriculum in VMT to help the government to come up with adequate video materials with relevant contents for teaching of farmers. This is necessary in increasing agricultural development, productivity and support for VMT platforms to facilitate farmers' access to quality agricultural information.

iii) The County governments or Extension Agencies ought to be supported to establish strong agricultural communication networks. This can be achieved by putting up a well-furnished agricultural training and resource centres with stable electricity supply and standby generators, good internet connectivity both in the agricultural centres and in agricultural wards within various local areas.

iv) It is important to employ technicians for maintenance of VMT resources in good working conditions. This would enhance easy training by extension agents and faster access of information by farmers.

5.4 Recommendations for further research

Future research may consider the following:

i) There is further need for a comparative study on the factors influencing adoption and use of VMT in agricultural extension in different geographical areas and ecological zones and socio-cultural contexts to ensure uniform development of agricultural information systems.

ii) Based on extension agents' suggestions, there is need to intensify the development and circulation of video clips in local language (s) to enable deeper understanding of critical issues being addressed in a particular subject area. The video clips should then be made available to both extension agents and farmers for the purposes of reinforcing training and learning processes for increased agricultural productivity.

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APPENDICES

Appendix A: Questionnaire for Extension Agents

Introduction

I am a student of MSc in agricultural extension of Egerton University, currently out to collect my research data. The purpose of this questionnaire is to help me gather information from public extension agents on factors influencing use of video mediated teaching and learning as an intervention to improve delivery of agricultural knowledge and skills to farmers in Homa-Bay County, Kenya. The information you give will be used for study purposes only and will be treated with utmost confidentiality.

Guidelines:

1. *Please complete all the sections provided herein*
2. *Tick (√) your appropriate answer from the alternatives given*

SECTION A: CHARACTERISTICS OF EXTENSION AGENT

1. Gender

   Male ( ) Female ( )

2. Tick the age category that represents your age

26-30 ( ) 31-35 ( ) 36-40 ( ) 41-45 ( ) 46-50 ( ) 51-55 ( ) 56 or more ( )

3. Highest qualification

Diploma ( ) Degree ( ) Masters ( ) other (Please specify) _____

4. Designation (e.g. Livestock, fisheries, crops, Agribusiness, Homeconomics etc.)

_____

5. Place of work _____

6. Tick appropriate number of years of experience applicable to you

   Less than 5yrs ( ) 5-10 yrs ( ) 11-15 yrs ( ) 16-20 yrs ( ) 21-25 yrs ( ) 26-30 yrs ( ) more than 30yrs ( )

7. Do you use videos to reinforce learning by farmers when teaching agricultural concepts?

   Yes ( ) No ( )

8. Competence Levels.

On a scale of 1 to 5, kindly rate your competence on the use of video materials listed below by ticking where applicable to you using the following scale:

1= Very low, 2= Low, 3=Moderate, 4= High, 5= Very high

Statement/item	Very Low	Low	Moderate	High	Very High
1. Use of the white board in training farmers					
2. Use of an overhead projector to train farmer					
3.Sourcing video clips from internet for use					
4. Preparing videos for teaching farmers locally.					
5.Use of computers to assist with class work teaching					
6.Use of computers for personal work in lesson preparation					
7.Showing videos to farmers during training					
8.Consulting with bloggers on available agricultural videos					

9. Awareness.

Below are some operations done in the process of using VMT. Please indicate by **TICKING** in the appropriate box to rate your level of awareness to use of these VMT resources.

1= Very low, 2= Low, 3= moderate, 4=High, 5= Very high

Statement/item	**Very low**	**Low**	**Moderate**	**High**	**Very high**
1. Use the white board to train farmers					
2. Use overhead projector to train farmer					
3. Source video clips from internet for use					
4. Prepare videos for teaching farmers locally.					
5. Use computers to assist with class work teaching					
6. Use computers for personal work in lesson preparation					
7. Show videos to farmers during training					
8. Consult with bloggers on available agricultural videos					

10. Attitude towards use of Video Instructional Resources.

On a scale of 1 to 5 where NU= Not Useful, SU= Slightly Useful, MU= Moderately Useful, U= Useful, HU=highly Useful, kindly give your opinion on the following operations regarding use of VMT. (Tick where applicable to you).

Item	NU	SU	MU	U	HU
1.Using whiteboard to write and explain points to farmers during training					
2. Preparing video materials locally for teaching of farmers.					
3.Playing videos clips to elaborate and clarify abstract concepts to farmers					
4. Using video to capture the attention of farmers during training					
5. Incorporating videos to motivate and excite farmers to learn successfully					
6. Employment of overhead projectors to aid in viewing of videos during learning sessions					
7. Using computers to facilitate learning					
8.Acquiring basic computer skills for its use by extension agents during VMT-based trainings					
9.Embracing challenges to use of videos for successful learning to take place					
10. Applying VMT to supplement the existing extension methods.					
11. Training farmers through videos to yield better and more permanent learning outcomes.					

Section B: Video Characteristics

Availability of video instructional resources

11.In your opinion please kindly rate as to what extent you either agree with the availability of the following items for use by TICKING where applicable to you**:**0=Not available, 1=Slightly available, 2=Moderately available, 3= Available, 4=Highly available

Video use resources	**Not available**	**Very few**	**Moderately available**	**Available**	**Very much available**
1. White boards					
2. Flip charts					
3. Overhead projectors					
4. Video cameras					
5. Computers					
6. DVD/CD players					
7. Television Screen					
8. Agricultural videos in CDs and DVDs					
9. Digital camera(s)					
10. Internet access points					

Reliability of the VMT items

12. On a scale of 1 to 5where0= Not reliable, 1= Slightly reliable, 2= Moderately reliable 3=Reliable, 4=Highly reliable. Please kindly rate the reliability to use the listed video items below in training of farmers. (Tick where applicable to you)

Video use resources	Not reliable	Slightly reliable	Moderately reliable	Reliable	Highly reliable
1. White boards					
2. Flip charts					
3. Overhead projectors					
4. Videos cameras					
5. Computers					
6. DVD/CD players					
7. Television Screen					
8. Agricultural videos in CDs and DVDs					
9. Digital camera(s)					
10. Internet access points					

SECTION C: Extension Institutional Characteristics

13. Please kindly give your opinion as to what extent you either agree or disagree with the following statements by **TICKING** where applicable to you: **1= Strongly Disagree, 2= Disagree, 3= Undecided, 4= Agree (A), 5= Strongly Agree (SA).**

Statement	SD	D	UD	A	SA
1. Videos with the right content are readily available for use in our institution					
2. The administration always organize for in-service trainings to staff on use of emerging instructional technologies					
3. There is a technician employed to assist and guide the staff on use of instructional technologies					
4. There is freedom to access and use video resources any time I want					
5. There are adequate video resources for all the staff in our institution					
6. Video resources are available but not in working conditions					
7. There is stable source of power to support use of video in the place where I work					
8. There is a well-furnished training centre within the region where I work owned by the government.					
9. Internet connection is available for use to source for agricultural training videos in our institution					
10. My institution collaborates with other global organizations to access and share agricultural training videos on different farming enterprises					

SECTION D: Extension Environment Characteristics

14. Is thereany other source of power a part from electricity to support use of video to train farmers while in the field and outside your institution?

Yes ( )No ( )

15. Do you have a room where farmers can view the videos in the area you are designated to work?

Yes ( )No ( ) Not sure ( )

16. How can you rate the responsiveness of farmers to training using Information Communication Technology tools such as videos compared to other extension methods?

1.Very high ( ) 2.High ( ) 3. Average ( ) 4. Low ( ) 5. Very low ( )

17. How can you rate the accessibility of agricultural information by farmers based on the distance from your offices and farmers' homes?

1. Very good ( ) 2. Good ( ) 3. Average ( ) 4. Poor ( ) 5. Very poor ( )

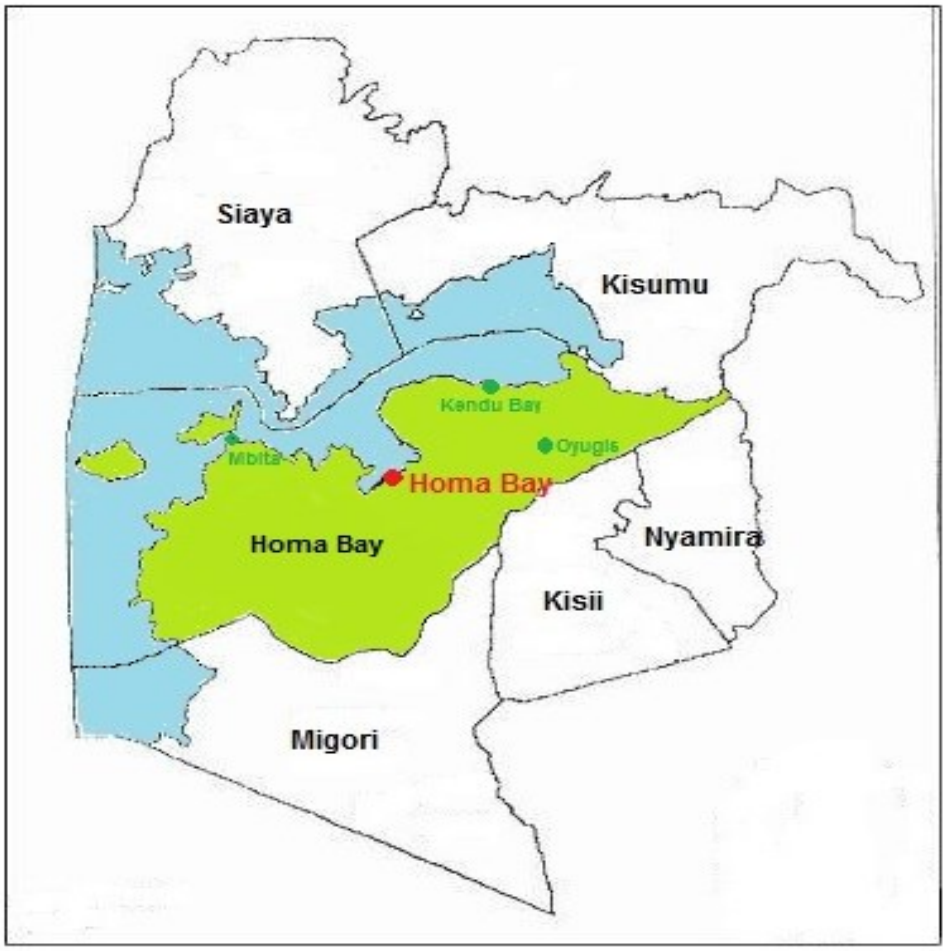
18. Suggest ways in which Video Mediated Technology can be used to improve learning and dissemination of agricultural knowledge and skills in your area.

_____

_____

THANK YOU FOR YOUR PARTICIPATION

Appendix B: Map of Study Area



Appendix C: Research Permit

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: +254-20-2213471,
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9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/17/11363/17109**

Date: **9th May, 2017**

Javan Otieno Owiti
Egerton University
P.O. Box 536-20115
EGERTON.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Factors influencing use of video mediated technology for teaching of agricultural knowledge and skills by public extension agents in Homa-Bay County, Kenya,"*** I am pleased to inform you that you have been authorized to undertake research in **Homa Bay County** for the period ending **8th May, 2018.**

You are advised to report to **the County Commissioner and the County Director of Education, Homa Bay County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Homa Bay County.

The County Director of Education
Homa Bay County.

THIS IS TO CERTIFY THAT:
MR. JAVAN OTIENO OWITI
of EGERTON UNIVERSITY, 0-40404
Rongo,has been permitted to conduct
research in *Homabay County*

on the topic: *"FACTORS INFLUENCING USE OF VIDEO MEDIATED TECHNOLOGY FOR TEACHING OF AGRICULTURAL KNOWLEDGE AND SKILLS BY PUBLIC EXTENSION AGENTS IN HOMA-BAY COUNTY, KENYA."*

for the period ending:
8th May,2018

.....
Applicant's Signature

Permit No : NACOSTI/P/17/11363/17109
Date Of Issue : 9th May,2017
Fee Recieved :Ksh 1000

.....
Director General
National Commission for Science, Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit.
2. Government Officer will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one (1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

National Commission for Science, Technology and Innovation

RESEACH CLEARANCE PERMIT

Serial No.A 14055

CONDITIONS: see back page

Appendix D: Key Data Analysis Outputs

Use Videos to teach Farmers

Statistics

USE VIDEOS TO TEACH FARMERS

N	Valid	85
	Missing	0
Mean		1.8353
Std. Error of Mean		.04047
Median		2.0000
Mode		2.00
Std. Deviation		.37312
Variance		.139
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		156.00

USE VIDEOS TO TEACH FARMERS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	14	16.5	16.5	16.5
	No	71	83.5	83.5	100.0
	Total	85	100.0	100.0	

Competence_USE OVERHEAD PROJECTOR TO TRAIN FARMERS

Statistics

competence_USE OVERHEAD PROJECTOR TO TRAIN FARMERS

N	Valid	85
	Missing	0
Mean		1.0941
Std. Error of Mean		.03186
Median		1.0000
Mode		1.00
Std. Deviation		.29373
Variance		.086
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		93.00

Competence_USE OVERHEAD PROJECTOR TO TRAIN FARMERS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very low competence	77	90.6	90.6	90.6
	low competence	8	9.4	9.4	100.0
	Total	85	100.0	100.0	

Competence_SHOW VIDEOS TO FARMERS DURING TRAINING

Statistics

competence_SHOW VIDEOS TO FARMERS DURING TRAINING

N	Valid	85
	Missing	0
Mean		1.1647
Std. Error of Mean		.04379
Median		1.0000
Mode		1.00
Std. Deviation		.40376
Variance		.163
Range		2.00
Minimum		1.00
Maximum		3.00
Sum		99.00

Competence_SHOW VIDEOS TO FARMERS DURING TRAINING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	very low competence	72	84.7	84.7	84.7
	low competence	12	14.1	14.1	98.8
	moderately competence	1	1.2	1.2	100.0
	Total	85	100.0	100.0	

Attitude_VIDEO HELP TO CAPTURE FARMERS' ATTENTION

Statistics

Attitude_VIDEO HELP TO CAPTURE FARMERS' ATTENTION

N	Valid	85
	Missing	0
Mean		4.3412
Std. Error of Mean		.05173
Median		4.0000
Mode		4.00
Std. Deviation		.47692
Variance		.227
Range		1.00
Minimum		4.00
Maximum		5.00
Sum		369.00

Attitude_VIDEO HELP TO CAPTURE FARMERS' ATTENTION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	useful	56	65.9	65.9	65.9
	highly useful	29	34.1	34.1	100.0
	Total	85	100.0	100.0	

Availability_VIDEOS

Statistics

Availability_VIDEOS

N	Valid	85
	Missing	0
Mean		1.0824
Std. Error of Mean		.02999
Median		1.0000
Mode		1.00
Std. Deviation		.27653
Variance		.076
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		92.00

Availability_VIDEOS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not available	78	91.8	91.8	91.8
	slightly available	7	8.2	8.2	100.0
	Total	85	100.0	100.0	

Statistics

Attitude_VIDEO IS DIFFICULT TO USE IN TRAINING OF FARMERS

N	Valid	85
	Missing	0
Mean		1.4824
Std. Error of Mean		.07598
Median		1.0000
Mode		1.00
Std. Deviation		.70054
Variance		.491
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		126.00

Attitude_VIDEO IS DIFFICULT TO USE IN TRAINING OF FARMERS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not useful	51	60.0	60.0	60.0
	slightly useful	29	34.1	34.1	94.1
	moderately useful	4	4.7	4.7	98.8
	highly useful	1	1.2	1.2	100.0
	Total	85	100.0	100.0	

Reliability_VIDEOS

Statistics

Reliability_VIDEOS

N	Valid	85
	Missing	0
Mean		1.0824
Std. Error of Mean		.02999
Median		1.0000
Mode		1.00
Std. Deviation		.27653
Variance		.076
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		92.00

Reliability_VIDEOS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not reliable	78	91.8	91.8	91.8
	slightly reliable	7	8.2	8.2	100.0
	Total	85	100.0	100.0	

RELY ON VIDEO

Statistics

RELY ON VIDEO

N	Valid	85
	Missing	0
Mean		1.2118
Std. Error of Mean		.04458
Median		1.0000
Mode		1.00
Std. Deviation		.41098
Variance		.169
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		103.00

RELY ON VIDEO

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	67	78.8	78.8	78.8
	Occasionally	18	21.2	21.2	100.0
	Total	85	100.0	100.0	

VIDEOS WITH RIGHT CONTENT ARE READILY AVAILABLE IN OUR INSTITUTION

Statistics

VIDEOS WITH RIGHT CONTENT ARE READILY AVAILABLE IN OUR INSTITUTION

N	Valid	85
	Missing	0
Mean		1.3294
Std. Error of Mean		.07919
Median		1.0000
Mode		1.00
Std. Deviation		.73010
Variance		.533
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		113.00

VIDEOS WITH RIGHT CONTENT ARE READILY AVAILABLE IN OUR INSTITUTION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	65	76.5	76.5	76.5
	Disagree	16	18.8	18.8	95.3
	Undecided	1	1.2	1.2	96.5
	Agree	2	2.4	2.4	98.8
	Strongly agree	1	1.2	1.2	100.0
	Total	85	100.0	100.0	

THERE IS FREEDOM TO ACCESS AND USE VIDEO RESOURCES ANY TIME I WANT

Statistics

THERE IS FREEDOM TO ACCESS AND USE VIDEO RESOURCES ANY TIME I WANT

N	Valid	85
	Missing	0
Mean		1.8706
Std. Error of Mean		.06436
Median		2.0000
Mode		2.00
Std. Deviation		.59338
Variance		.352
Range		3.00
Minimum		1.00
Maximum		4.00
Sum		159.00

THERE IS FREEDOM TO ACCESS AND USE VIDEO RESOURCES ANY TIME I WANT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	19	22.4	22.4	22.4
	Disagree	60	70.6	70.6	92.9
	Undecided	4	4.7	4.7	97.6
	Agree	2	2.4	2.4	100.0
	Total	85	100.0	100.0	

THERE ARE ADEQUATE VIDEO RESOURCES FOR ALL STAFF IN OUR INSTITUTION

Statistics

THERE ARE ADEQUATE VIDEO RESOURCES FOR ALL STAFF IN OUR INSTITUTION

N	Valid	85
	Missing	0
Mean		1.6118
Std. Error of Mean		.05317
Median		2.0000
Mode		2.00
Std. Deviation		.49024
Variance		.240
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		137.00

THERE ARE ADEQUATE VIDEO RESOURCES FOR ALL STAFF IN OUR INSTITUTION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	33	38.8	38.8	38.8
	Disagree	52	61.2	61.2	100.0
	Total	85	100.0	100.0	

THERE IS A STABLE SOURCE OF POWER TO SUPPORT USE OF VIDEO IN THE REGION WHERE I WORK

Statistics

THERE IS A STABLE SOURCE OF POWER TO SUPPORT USE OF VIDEO IN THE REGION WHERE I WORK

N	Valid	85
	Missing	0
Mean		2.1529
Std. Error of Mean		.09831
Median		2.0000
Mode		2.00
Std. Deviation		.90640
Variance		.822
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		183.00

THERE IS A STABLE SOURCE OF POWER TO SUPPORT USE OF VIDEO IN THE REGION WHERE I WORK

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	12	14.1	14.1	14.1
	Disagree	62	72.9	72.9	87.1
	Agree	8	9.4	9.4	96.5
	Strongly agree	3	3.5	3.5	100.0
	Total	85	100.0	100.0	

THERE IS A WELL-FURNISHED TRAINING CENTRE WITHIN THE REGION WHERE I WORK OWNED BY GOVT

Statistics

THERE IS A WELL-FURNISHED TRAINING CENTRE WITHIN THE REGION WHERE I WORK OWNED BY GOVT

N	Valid	85
	Missing	0
Mean		1.1529
Std. Error of Mean		.03927
Median		1.0000
Mode		1.00
Std. Deviation		.36207
Variance		.131
Range		1.00
Minimum		1.00
Maximum		2.00
Sum		98.00

THERE IS A WELL-FURNISHED TRAINING CENTRE WITHIN THE REGION WHERE I WORK OWNED BY GOVT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	72	84.7	84.7	84.7
	Disagree	13	15.3	15.3	100.0
	Total	85	100.0	100.0	

EXTENSION ENVIRONMENT

Statistics

RATING THE ACCESSIBILITY OF AGRICULTURAL INFORMATION BY FARMERS BASED ON DISTANCE FROM EXTENSION OFFICES

N	Valid	85
	Missing	0
Mean		3.2235
Std. Error of Mean		.07917
Median		3.0000
Mode		3.00
Std. Deviation		.72991
Variance		.533
Range		4.00
Minimum		1.00
Maximum		5.00
Sum		274.00

RATING THE ACCESSIBILITY OF AGRICULTURAL INFORMATION BY FARMERS BASED ON DISTANCE FROM EXTENSION OFFICES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very good	1	1.2	1.2	1.2
	Good	7	8.2	8.2	9.4
	Average	54	63.5	63.5	72.9
	Poor	18	21.2	21.2	94.1
	Very poor	5	5.9	5.9	100.0
	Total	85	100.0	100.0	

Extension Agents' choice of VMT compared to others

Statistics

Extension Agents' choice of VMT compared to others

N	Valid	85
	Missing	0
Mean		1.5294
Std. Error of Mean		.19126
Median		1.0000
Mode		1.00
Std. Deviation		1.76330
Variance		3.109
Range		11.00
Minimum		.00
Maximum		11.00
Sum		130.00

Extension choice of VMT compared to others

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	not at all	13	15.3	15.3	15.3
	rarely	46	54.1	54.1	69.4
	sometimes	13	15.3	15.3	84.7
	most times	8	9.4	9.4	94.1
	always	5	5.9	5.9	100.0
	Total	85	100.0	100.0	

Appendix E: Abstract Page of Published Papers

Researchjournali's Journal of Agriculture
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Extension Agent's Personal Characteristics Influencing The Use Of Video Mediated Technology In Teaching Agricultural Knowledge And Skills To Farmers In Homa-Bay County, Kenya

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ABSTRACT

The study assessed public extension agent's factors influencing their use of video mediated technology (VMT) in Homa-Bay County, Kenya. All the 85 extension agents in Homa Bay County were assessed using a structured questionnaire. The study found out that the extension agents were relatively young with a mean age of 38. The majority (61.2 %) of the extension agents had a Diploma level of professional training, while 35.3 % had Bachelors, 2.4% had Masters and 1.2%had Doctorate Degrees. Even though the agents had an ability to use VMT, their use of it was rated as low (mean of 3.67) on a scale of 1 to 15. The personal characteristics affecting the level of use of VMT among the extension agents in Homa-Bay were found to be level of competence (β=.478, p=.001), poor attitudes towards VMT (β=.431, p=.001) and lack of awareness of VMT (β=.626, p=.001). Working experience (or number of years worked) was found to have no statistical significant influence (β=.033, p= .668) on the use of VMT by extension agents. The study recommended that the training of the agents on VMT would create awareness, enhance their competence and improve their attitudes towards the usefulness of VMT.

Keywords: VMT, Public extension agents, Teaching, Agricultural, Knowledge, Skills

Extension Environment Characteristics Influencing the Use of Video Mediated Technology in Teaching Agricultural Knowledge and Skills to Farmers in Homa-Bay County, Kenya.

Date
2019-04

Author
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The study assessed extension environmental factors influencing the use of video mediated technology (VMT) by public extension agents in Homa-Bay County, Kenya. All the 85 extension agents in Homa Bay County were assessed using a structured questionnaire. The collected data was then cleaned, coded and analysed using descriptive and bivariate linear regression. The internal reliability of the created indices was determined using Cronbach's alpha (α) and an alpha of above .70 was considered adequate for this study. The study found out that there was low rate of use of VMT, and that the extension environmental characteristics had a positive and significant influence (β= .215, p=.048) on the use of VMT by the extension agents in Homa-Bay County. The influence of extension environment on the use of video mediated technology was rated as average (mean of 5.2) on a scale of 1 to 10. The extension environmental characteristics affecting the level of use of VMT among the extension agents in Homa-Bay were found to be low level of response by the farmers to VMT trainings, lack of electricity away from training centres in the local agricultural areas and inaccessibility of training centres by farmers due to long distances and poor road networks. The study recommended that the public education of the farmers on video mediated learning, establishment of Video Viewing Shops (VVS) strategically, adequate electricity connectivity and improved road network systems within the local areas would improve farmers' attitude towards the usefulness of VMT and increase their ability to access agricultural information in the attempt to improve farm productivity through better agricultural practices.

URI
http://ir.mksu.ac.ke/handle/123456780/4451