

**INFLUENCE OF PRINCIPALS' CHARACTERISTICS AND THE USE OF  
INFORMATION TECHNOLOGY IN SCHOOL MANAGEMENT IN  
PUBLIC SECONDARY SCHOOLS IN MACHAKOS COUNTY, KENYA**

**BY**

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## DECLARATION

I confirm that this research project is my original work and has not been presented in any other university/institution for certification. The project has been complemented by referenced works duly acknowledged. Where text, data, graphics, pictures or tables have been borrowed from other works including the internet, the sources are specifically accredited through referencing in accordance with anti-plagiarism regulations.



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## SUPERVISOR'S DECLARATION

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## **DEDICATION**

I dedicate this project to my family, recognising their support during its preparation.  
You have been patient with me, while I stayed away both in class and in the field;  
your encouragement was priceless.

## **ACKNOWLEDGEMENT**

This work would not have materialised without the guidance of my supervisor; Dr. Hellen Guantai who has constantly been supportive of me, through her knowledge, experience and time. She allowed me to learn and work in my own way.

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## **ABBREVIATIONS AND ACRONYMS**

BOM:	Board of Management
GOK:	Government of Kenya
IT	Information Communication and Technology
MoEST:	Ministry of Education Science and Technology
NACOSTI:	National Council for Science Technology and Innovation
SPSS:	Statistical Package for Social Sciences
TAM:	Technology Acceptance Model
UNESCO:	United Nation Educational Scientific and Cultural Organization

## ABSTRACT

In as much as the use of technology makes management effective, school principals have been slow in using the same to manage the institutions. This study sought to establish the influence of principals' characteristics on the use of Information Technology in secondary school management in Machakos County. The study was guided by the following objectives: to establish the influence of principals' personality on the use of information technology in public secondary schools management in Machakos County, to establish how the principal's attitude towards IT influences the use of information technology in public secondary schools management in Machakos County, to explore how the principals' IT skills influences the use of information technology in public secondary schools management in Machakos County and to establish the influence of the principals' social networks on the use of information technology in public secondary schools management in Machakos County. The study was guided by the Technology Acceptance Model (TAM). The study adopted a correlational research design. The target population was the 58 principals and 868 teachers in Machakos County. The sample size was 194 including the 21 principals identified through purposive sampling, and 173 teachers identified through purposive sampling and simple random sampling. The study used both qualitative and quantitative data. Quantitative data was collected using questionnaires while qualitative data was collected using the interview schedule. Validity was established through triangulation and expert judgement, while test-retest method was done to ensure reliability. Quantitative data was analyzed using SPSS version 22. Descriptive statistics i.e. Mean and Standard deviation were used to analyse quantitative data. Inferential statistics i.e. correlation analysis was done to establish the influence of the independent variables on the dependent variable. Qualitative data analysis approach was used for the qualitative data, and presented through narration and verbatim quotes. Pearson Correlation Coefficient was used to test the relationship between the dependent variable and independent variables of the study at 95% confidence level or at 5% level of significance. The findings revealed that the principals' personality, attitude, IT skills and the social networks positively influenced the use of IT in school management in Machakos County. The study concluded that the principals' personality, attitude, IT skills and social networks positively influenced use of IT in school management. The study recommends that the Ministry of Education should enhance the provision of IT resources in schools and also sponsor principals for IT courses in order to improve their skills. The schools should strive to build partnerships with both government and the community in order to broaden their networks and adopt the best practices in their schools.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Introduction**

This chapter presents the background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study. The chapter also entails the delimitations of the study, assumptions of the study, theoretical framework, conceptual framework and operational definition of key terms.

#### **1.2 Background of the Study**

The rapid growth in Information Technologies (IT) has seen the introduction of major changes in the twenty-first century. It has also necessitated changes in the priorities of contemporary societies; IT is gradually becoming an indispensable tool not only in our daily lives but also in the systems of education (Buabeng-Andoh, 2012). IT has styled itself as a principal driver of both economic and social progress. As a result of this, there is need to invest in education and adopting reforms geared towards integrating these technologies in teaching, learning and even school management (Kozma, 2005). Kelles (2005) further elucidates that IT is a major factor in almost all spheres of our lives that is political, economic, social and cultural life. It is promptly changing how business is being transacted, how information and services are being accessed, how communication is happening between individuals with each other and even how entertainment is being provided. Gigler (2011) maintains that the potential of IT to expand human abilities and enhance management of education was first documented in business and military. Although

the foregoing can be said about all the other spheres of the economy, the education sector in Kenya and particularly Machakos County does not seem to have made such significant strides especially in the area of school management. This formed the conceptualization of the current study.

In order to keep up the pace with the other sectors of the economy, there is sustained pressure on learning institutions to use IT to impart skills and knowledge that is relevant to 21<sup>st</sup> century learners. These learning institutions have however realized the influence of IT at both the workplaces and daily life and as such they have begun restructuring their instructional curricula and even classroom facilities, in an effort to connect the prevailing gap in technology in teaching and learning. This reorganization process demands adopting technologies effectively and integrating it into the current environment so that the learners can be provided with the specific knowledge in the various subjects so as to promote relevant learning and to enhance professional productivity (Tomei, 2005). School managers on the other hand need to keep abreast with changes in technologies especially with regard to current practices in school management. The irony is that there are issues with many of them as far as the use of IT in school management is concerned which informed the conceptualization of this study.

IT implementation is a reality in many developed countries for example, according to UNESCO (2014) report, in the USA, the one-to-one laptop program in the primary schools was hailed as an important project. The report however notes that the outcome of the project could not be quantified in terms of improved reading and

writing skills, or lack of them thereof. This could however be a weakness of the data collection tools, or even that IT had no impact on learning. The project nevertheless has been hailed for helping students to collaborate with each other. Again in spite of the hitches, IT remains a major project investment for the country. This project underscores the importance of IT in education. This study however focused on the use of IT in teaching and learning, and failed to address the issue of school management, and how IT can be used in school management. The current study aims at establishing the principals' characteristics and how they influence the use of IT in school management. This is due to the fact that principals are the key drivers in any school organization and hence their ability to embrace IT would be critical in informing how school management is done.

Maki (2008) postulates that IT integration is key to the improvement of daily school management. In a study done in secondary schools in Cyprus, it was established that IT integration is important for employees, student, resources, fiscal and general management. The study further discloses that secondary schools in Cyprus adopted IT in both teaching and school administration. In contrast, Empirica (2006) states that even though major strides had been made in IT integration, its use in school management continued to be at the infant stage and consequently warranted further investigation. This study therefore anticipated to find out whether the reason for the low use was the principals' characteristics.

Globally, IT has been in use in teaching and learning for a long time. For example, in the United States, there are national technology standards that are adopted in K-12 education. Currently, 98 percent of states in U.S. use the National Educational

Technology Standards (NETS). Guided by the technology standards, instructors do not only use technology in teaching, but also require students to create projects with technology (Delgado, Wardlow, McKnight & O'Malley, 2015).

Countries such as Australia, US, Japan, Malaysia, Singapore and Philippines have ongoing initiatives on integrating educational technology (ICT-based) in education. Some have created competency standards for technology (Bitter & Pierson, 2005 as cited by Omariba, Ondigi & Ayot, 2016). However, integrating educational technology (ICT-based) is still a complex process of educational change, and the extent of ICT application in many countries and schools is extremely varied in most cases, very limited (González-Sanmamed, Sangrà & Muñoz-Carril, 2017).

In Kenya, the use of IT in teaching and learning has been ongoing since the launch of Vision 2030 policy, however not much has been going on in the area of using IT in school management (Ibrahim, 2016). Consequently, it would be important to find out the influence of principals' characteristics on the current status of IT in school management. In Machakos county there is a considerable technological backwardness among secondary schools (Mwunda, 2014). A great deal of management duties in secondary schools are still carried out manually regardless of the IT policy of 2006 for administrators of secondary schools to use IT (Makewa, Meremo, Role & Role, 2013). This implies that the use of IT in school management has not been embraced fully (Mobegi, Ondigi & Oburu, 2010). It is common to find schools still analyzing results manually, filling report forms, writing hard copy letters to invite parents for school functions among other areas. This is in spite of

research showing that principals who have IT skills are more likely to adopt IT in school management and therefore improving efficiency.

Ibrahim (2016) conducted a research study that focused on factors affecting the embracing of IT in secondary schools in Westlands, Kenya. The study used questionnaires to collect data. The survey discovered that adopting IT in formative and administrative functions was significantly affected by the IT skills of the school managers, in addition to their attitudes towards IT. However, the current study intends to investigate whether the IT skills of the principal would have an influence on the IT use in school management among the principals in Machakos County.

The principals' support for IT use in school management however is influenced by their characteristics which in turn influence their decision to adopt, and or the extent to which they adopt technology in the management of their schools. Such characteristics include the principals' personality, since people react in varied ways to new ideas, practice, or even objects, owing to their differences in attitudes toward technological innovations. Lo (2014) treats personality traits as those characteristics of an individual that takes a pervasive effect over a far-reaching variety of behaviours related to that characteristic i.e. the tendency to behave in a certain way. In this study, personality was evaluated in terms of uniqueness and conformity. Uniqueness refers to the nature of a person i.e. the specific characteristics that make a character to be distinct from the rest. Conformity on the other hand refers to characteristics that make a person to do what everyone else is doing without the desire to stand out. Individuals who seek to be unique are usually more receptive to

change than those who conform (Den Ouden, 2011). Consequently, individuals who want to be unique will be more willing to adopt technology in management ahead of their peers in order to stand out, compared to those who want to conform and maintain the status quo. This study attempted to establish the different personality traits of the principals, and link it to the use of technology in school management. The study attempted to find out the driving force behind the adoption or lack of adoption of technology in school management.

IT can ease the managerial duties of the principal (Njoroge, 2018). One such a duty is the school plant management. School plants are made up of the school land and all the physical structures on it. It also includes the site, buildings, physical equipment, recreational spaces and books used for the achievement of educational objectives (Ogundile & Okagbue, 2014). From these views, school plant simply means the location, fixed structures and movable materials in school. In personnel management the principal can use IT to ensure an efficient way of guaranteeing that personnel within an organization are drafted, hired and paid while providing a work environment that promotes work performance and attaining goals (Githagu, 2017). The school managers also monitor learner records, curriculum and financial management, provision of resources, both educational and human while availing finances to run the school. IT has provided a number of programs that has eased the management of and monitoring the school activities with the touch of a button (Ibrahim, 2016).

The successful initiation and implementation of technology in the school management programs however depends a great deal on the principals' attitude. It is

generally believed that when the principal perceives technology as neither satisfying their needs nor those of the learners, it becomes unlikely that they would integrate that technology into the school management (Hew & Brush, 2007) & (Keengwe & Onchwari, 2008) as cited by Vanderlinde, Dexter & van Braak, 2012). Again, if the principals' favour using technology they can offer valuable insights concerning its integration into teaching, learning and even school management processes. This study attempted to find out the principals' attitude towards IT and then link it to the use of IT in the school management.

Again, the effective use of IT in school management requires IT skills on the part of the user in order to enable them use technology with confidence and thereby assimilate it in the professional operations (Wanjala, Khaemba & Mukwa, 2011). Further the success of incorporating technology in school administration in the developing countries like Kenya is largely influenced by the readiness of both the school managers and teachers to use computers. When they have undergone the necessary training, their capacity to choose, adopt and even assess the computer tools necessary for the support of school administration also improves. Ibrahim (2016) posits that as schools get better equipped with IT tools and resources, managers will have the ability to use e-mails, web browsers, database, spreadsheets, word processors, PowerPoint software, page maker in school management, and they will also acquire new and better skills in the use of these technologies. This calls for principals to be skilled in technology use. The current study attempted to establish the principal's IT skills and link it to the use of IT on school management.

Another factor that determines the principal's use of IT is the principal's social networks (MacVaugh & Schiavone, 2010). In the adoption of technology, people will tend to compare themselves with their peers in the community. This implies that if a particular kind of technology is acceptable among peers who are considered reference groups by certain individuals, it is then likely that those individuals affiliated to the reference group will adopt it (Lekhanya, 2013). According to the Machakos County Director of Education Office (2019), only 58 public secondary schools in the County are using IT in school management. Bench marking trips are often made, symposia organized and even friendly sports competitions conducted among sister schools every school term in the county. One striking factor though is that a majority of these participating schools do not use IT in school management. It is in this light that the current study intended to link the principals' characteristics to their influence on IT use in school management.

### **1.3 Statement of the Problem**

There is a lot of emphasis on IT implementation in the education sector with focus on teaching and learning. Whereas considerable ground has been gained in the area of teaching and learning, the same may not be said with regard to IT use in school management. Despite the ease of work that the use of IT integration would bring to school management, principals are still analogue and doing things the traditional way. Consequently, it is common to see volumes of files and tonnes of paperwork in school shelves. School managers are not using IT in the management of students' records, financial management and even personnel management. Rather than use volumes of files and tonnes of paperwork, IT would come in handy to assist in

storing such files in an electronic format, which makes it easy to share and even retrieve, thus saving on space and even time required to access the stored information. This also makes the work processes making work more efficient. In Machakos County, of the 153 public secondary schools in the County, only 58 have incorporated IT in school management. The continued failure to make use of the opportunities brought about by technology in education embodies a far-reaching gap in skilled innovative manpower. Whereas efforts have been made by the Ministry of education to provide the requisite infrastructure in the schools, use of IT in school management is still wanting and this triggered the conceptualization of this study.

#### **1.4 Purpose of the Study**

The study aimed at finding out whether principals' characteristics had an influence on the use of information technology in secondary school management in Machakos County.

#### **1.5 Objectives of the Study**

The study ought to:

- (i) Establish the influence of principals' personality on the use of information technology in public secondary schools' management in Machakos County.
- (ii) Establish how the principal's attitude towards IT influences the use of information technology in public secondary schools' management in Machakos County.
- (iii) Explore how the principals' IT skills influence the use of information technology in public secondary schools' management in Machakos County.

- (iv) Establish the influence of the principals' social networks on the use of information technology in public secondary schools' management in Machakos County.

### **1.6 Research Questions**

- (i) How does the principals' personality influence the use of information technology in public secondary schools' management in Machakos County?
- (ii) How does the principals' attitude influence the use of information technology in public secondary schools' management in Machakos County?
- (iii) What is the influence of the principals' IT skills on the use of information technology in public secondary schools' management in Machakos County?
- (iv) How do the principal's social networks influence the use of information technology in public secondary schools' management in Machakos County?

### **1.7 Assumptions of Study**

The study made the following assumptions:

- (i) That the principals' characteristics influence the use of information technology in secondary school management.
- (ii) That the respondents would be knowledgeable on how the principals' characteristics influence the use of IT in school management
- (iii) That the respondents would be cooperative during the data collection period.

## **1.8 Limitations of the Study**

It was impossible to ensure that the respondents were sincere in their responses; consequently, the researcher assured the respondents of the confidentiality of the information they would give.

The responses from the questionnaires may have been subjective; consequently, the findings from the questionnaire were triangulated with those of the interview guide. There were also limitations of time and financial resources during data collection, owing to the geographical scope of the study.

## **1.9 Delimitations of the Study**

The study restricted itself to Machakos County. Other neighbouring counties for example Nairobi and Kitui Counties were left out. The study generalizations may therefore be limited to Machakos County.

The study only covered issues related to the use of IT in school management. The study excluded the issues related to the use of IT in classroom management and IT infrastructure in schools.

The study also only focused on the principal's characteristics i.e. personality, attitude, IT skills and the principal's social networks as the study variables. The study findings therefore can only be generalized with regard to the study variables.

### **1.10 Significance of the Study**

The school leadership may benefit from the knowledge on causes of variation in technology use among schools. The findings would help principals and Board of Management (BoM) of the schools in Machakos County, Kenya to focus on the principal's characteristics in their schools that may enhance the use of technology in their schools.

The study may make policy recommendations aimed at enhancing use of technology among the secondary schools in Kenya. This may enable decision makers to formulate appropriate policies to enhance use of technology in schools. Specifically, it could help them to find out how principal's personality, attitude, IT skills and social networks would improve the school's use of technology.

The study may also form a foundation for future researchers on the subject of use of technology in schools.

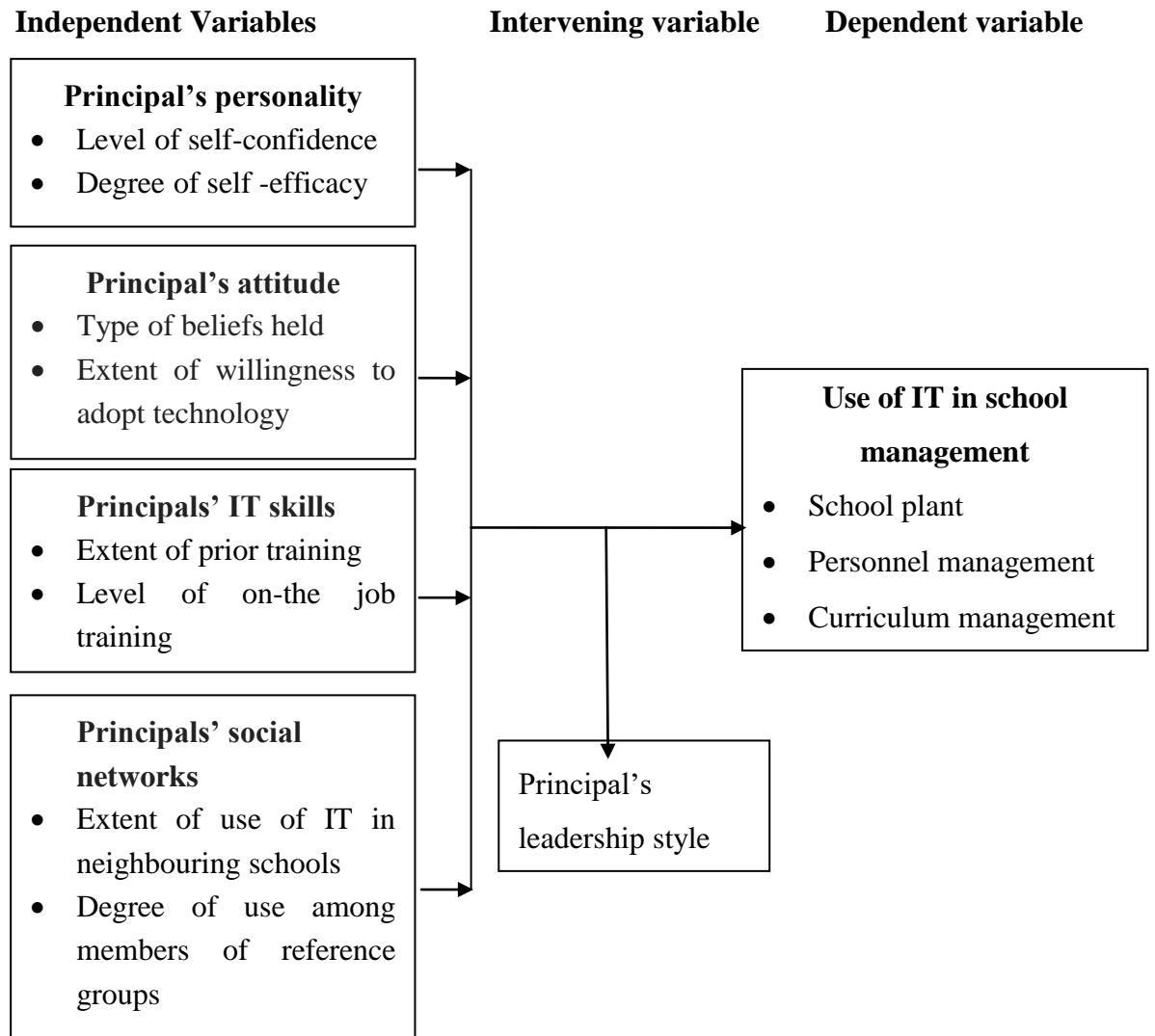
### **1.11 Theoretical Framework**

The study was guided by the Technology Acceptance Model (TAM). TAM was propounded by Davis in 1989. The model revolves around a person's behavior and their intention to use IT. The main tenets of this theory stipulate that an individual's intention to use technology is largely driven by how they perceive that technology to be of use to them and how easily they can use that technology. Adoption of the TAM model therefore requires that the user understands the end-users needs with regard to usefulness and how user-friendly it is (Chtourou & Souiden, 2010). Davis (1989) argues that usefulness and user friendliness influences such users' attitudes

towards that service. Davis (2019) therefore suggested that value for any technology is in meeting the users' needs which again depends on their perception of how useful it is rather than its objective assessment. Those who are opposed to this view disagree with its emphasis on the technical aspects while downplaying the very important social aspects of the technology users including ability, time, environmental/organizational limits and which all can limit the user freedom (Olumide, 2016).

This theory was adopted in this study since it addresses the factors that determine the adoption and use of technology. This study focused on the principal's characteristics that may influence the degree to which they adopt and use technology in school management. Specifically, the principals' perceived usefulness and ease of use of technology is a function of their self-confidence, and will determine whether they adopt that technology or not. Again, the ease of use and perceived usefulness will also depend on the user's attitude towards that technology, whether the user is interested in learning new ideas or is comfortable with status quo. Also, the principal's IT skills in technology would determine whether they adopt the technology or not. Further, if the people whom the principal considers significant in his/her social networks (colleagues) are using IT, they are likely to influence that principal to adopt technology. The reverse would also ring true.

## 1.12 Conceptual Framework



**Figure 1.1: Conceptual Framework showing the influence of principal's characteristics on the use of IT in school management**

The independent variables of the study were personality, attitude, IT skills and social networks. The personality of the principal for example the belief in self, motivation and even the decision making process would determine the level of use of technology in school management. Likewise, attitude towards technology in terms of perceived usefulness and ease of use would also influence use. Further, the

principal's IT skills in terms of prior training and experience with IT would also influence adoption. Finally, the principal's social networks in terms of who else among his/her colleagues in the locality is using technology in school management would also influence the use of IT since people tend to treat themselves as members of social groups. An increase/improvement in the independent variables would mean an increase in the use of IT in school management.

The intervening variable, which may have affected the findings of the study but was not being studied was the principal's leadership style. The dependent variable was the use of IT in school management. This is the variable that would be affected by the manipulation of the dependent variables. This would be seen in the areas of curriculum, personnel and school plant management.

### **1.13 Operational Definition of Terms**

The following words have the following meaning:

**Attitude:** the principal's frame of reference with regard to issues affecting technology; the perceived advantages / lack of them once adopted

**IT:** The technology in use in the school especially computer software.

**Personality:** the principal's unique attributes of a person which makes him/her think in a certain way with regard to adoption of technology.

**Self-efficacy:** the heads of institutions belief in self that once they adopt technology for use in school management, it will accomplish what they intend to.

**Social networks:** the sum total of the principal's regular interactions either individuals or groups of people

## **CHAPTER TWO**

### **RELATED LITERATURE REVIEW**

#### **2.1 Introduction**

Literature was reviewed on the four thematic areas i.e. principal's personality, principal's attitude, principal's IT Skills and principal's social networks how they influence the use of IT in secondary school administration. The section further includes the research gap and summary of literature review.

#### **2.2 Principal's personality and use of IT in school management**

Owing to the fact that people react in different ways in response to new ideas, practice, or objects based on differences in their personalities, the same applies to their response towards innovations (Den Ouden, 2011). Lo (2014) evaluates personality as all those traits of an individual which have pervaded over a wide range of behaviors related to that characteristic or the inclination to act in a certain way. He recommends a two-pronged model to assess how personality influences the acceptance of innovation. He identifies the novelty seeking trait, usually connected to sensory pursuing activities that bring about stimulation, spontaneous decision making and overindulgence. This pre-disposition to watch out for new goods and services, involves changes in one's motivation to pursue originality and thus governs the acceptance of innovative products (Adiele, 2012).

Secondly, there are those individuals who desire uniqueness. Manu (2012) posits that in reference to the uniqueness theory, there are individuals who find high levels of resemblance and variation unpleasant and consequently endeavour to become

distinct from their peers. The greater the degree of their perception of similarity with others, the greater their desire to be unique thus they seek for new ideas. In this case therefore, the more the individual exhibits these traits that is, novelty and desire for uniqueness, the more likely they are to adopt new innovations compared to those with less of the traits. Personality may likewise be seen in accordance with self-efficacy. As indicated by Saleem, Beaudry and Croteau (2011), self-efficacy is characterized as confidence in one's own capacities to perform an activity that is important in accomplishing an objective or a task. This implies that self-efficacy is the certainty that a person has in them the capacity to complete the tasks they begin. This subsequently implies that a worker's innovation self-efficacy likewise considers the view of the person on the probability of utilizing technology and innovation and on how far the individual recognizes accomplishment as being under their control.

Peralta and Costa (2007) studied teachers' confidence in using IT in Italy, Greece and Portugal. The study discovered various interesting discoveries; In Italy, educators' specialized capabilities with innovation are important elements in improving their confidence in using IT. The study likewise demonstrated that age, experience, both formative and individual factors as contributing to their self-confidence in using IT. This study was however conducted in developed nations where the education infrastructure including IT in school management may be well developed compared to schools in Kenya.

In another study conducted in Portugal involving teachers, the informants associated their feelings of self-confidence in their use of IT with the absence of fear of the likelihood to damage the computer they were using and also having total control over the same computer. They also listed presence of time for practice and also being supported by their peers as some of the conditions that favoured their confidence in using IT. The above listed factors allude to personal characteristics which greatly influenced the way they used technology innovations was dependent on personal characteristics. The current study intended to find out whether similar, personal characteristics can be validated in Machakos County.

Neyland (2011) evaluated the role of state senior school principals as leaders of technology adoption in Australia. The objectives included finding out the influence of personal characteristics on the use of IT in school management. Descriptive research design was adopted in surveying the degree of IT use in 56 schools. Purposive sampling was adopted in interviewing the principals of the institutions that used IT. The findings identified age, gender and work experience as major influencers of IT use. Further, the major areas where IT had been adopted was in instruction, evaluation and communication with stakeholders. The study further established the decision to use IT in the school lay with the willingness of the principal to adopt it and allowing other staff access to it. Further, teachers and the learners in the school expected the leader to guide them in the areas of IT implementation. The study was nevertheless conducted in a developed country where technology adoption levels are higher compared to the Kenyan situation and even more so in Machakos County.

Another study by Weber (2012) conducted in the USA assessed the influence of principal's personal characteristics on the adoption of IT in school management. The study employed a correlational research design. It sampled 54 schools in Houston. Purposive sampling was used to identify 10 teachers and the principal in each school who were the study respondents. Questionnaires and interview schedules were used for data collection. The study findings established that the main factors critical to the adoption of IT in school management included the teachers' exposure to IT, teachers' willingness to use IT and the school manager's personality. The current study intended to adopt a descriptive research design and compare the findings.

### **2.3 Principal's attitude and use of IT in School Management**

Trivedi (2011) asserts that attitudes mean the inclination to do; although it doesn't really show the actual behaviour. Individuals only act in a way that is agreeable to their attitudes and beliefs. This is due to the fact that if an individual acts in violation of their own beliefs and attitudes, internal dissonance and tension comes into play. Therefore, individual attitudes allow a person a plenty of data necessary for planning the perfect behaviour. In this context, the attitudes of principals towards the use of IT were considered.

In another study, Mingaine (2013) examined the dearth of skill which hindered the adoption and implementation of IT in public secondary schools in Kenya. The study discovered in order for full implementation of IT, the implementors must have positive attitudes towards the solution of the challenges that they come across while implementing IT projects in secondary schools. In another study, Al Sharija &

Watters (2012) evaluated the principals' practices in the adoption of IT. From the empirical data gathered, the study found that principals who favoured IT adoption were those with a positive attitude towards technology. These individuals were provided a lot of training during the introduction of useful technology in performing tasks in school administration, specifically tasks which involved them directly. The current study endeavours to explore three more factors including principal's personality, IT skills and social networks and their influence on IT use in the management of secondary schools.

Lee, Trimi & Kim (2013), also posit that the principal's attitudes towards IT are attributable to their cultural sensitivities. This means that the attitudes of these principals is shaped by their culture, which acts as the blueprint for societal standards. If an individual hails from a culture that easily embraces change and innovation in technology, then the individual will be more willing to adopt the use of technology in the school and the reverse is also true. The cultural background of the principal in this sense has a major influence on the adoption of IT in school management.

Ghavifekr, Afshari, Siraj & Seger (2013) studied the principals' attitudes towards the use of IT based management strategies in Singapore. Correlational research design was employed. The study sampled 155 schools where IT had been adopted in school management as a way to address the issues of indiscipline. Purposive sampling was used to identify school managers while simple random sampling was adopted to identify the teacher respondents. Questionnaires and interviews were the

data collection tools. The study found that the principals' attitude towards the use of IT in classroom management had a major influence on the decision to use IT and even the choice of technology to use. Further, the principal's perceived ease of use of certain technology and the usefulness of that innovation in classroom management had a major influence on the decision to adopt and use it. As can be observed from the foregoing, this study focused on the influence of the principal's attitude on the use of technology in classroom management while the current study intends to assess the influence of the principal's attitude on the use of technology in school management.

#### **2.4 Principal's IT skills and use of IT in School Management**

The school manager is the most important person in the decision to adopt reforms in education. The managers' knowledge, skill and philosophy influences the IT adoption approaches. The effective implementation of instructional innovations requires sufficient preparation to allow leaders to confidently integrate IT in technical tasks (Wanjala, Khaemba & Mukwa, 2011). They further argue that the success of such integration into the management of schools in developing countries like Kenya largely depends on whether the managers and teachers have received adequate preparations to use computers during their training. When adequately prepared, the school managers' capacity to choose, assimilate and assess technology tools to ease school management improves. Chepkonga (2015) posits that since schools are becoming better equipped with IT tools and resources, the school managers will need to have the ability to use e-mail, web browsers, data base,

spreadsheets, word processors and page maker. They also need to obtain new and better skills in IT in order to use these technologies.

Albirini (2006) as cited by Al-Zaidiyeen, Mei & Fook (2010) conducted a study on the influence of principals' IT Skills on technology use in classrooms in Hims (the largest Syrian province). This was a descriptive study of an exploratory nature. The target population was high school leaders at Hims. The high school teachers were 887 (214 males, 24%; 673 females, 76%). A sample of 326 was adopted. A questionnaire was used for data collection. The study observed that proper pre-service teacher education can provide a good chance for experimenting with technology even before it has been adopted in school administration. The absence of focus on IT in pre-service teacher education has been an obstacle to the school managers' use of IT. This implies that in the absence of effective training on IT, teachers are unable to use IT in school management. The study further asserts that prior IT skills have to be acquired by the school principals if IT integration in management is to succeed. This study however failed to link the principal's IT skills with use of IT in school management. The current study attempted to link the two.

Ogachi (2015) investigated the factors which influence the principals' integration of IT in the management of public secondary schools in Isinya Sub-county, Kenya. A descriptive survey design was employed for the study. The target population was all the 12 public secondary schools. Simple random sampling was used to arrive at a sample of 10 schools. A questionnaire was used to collect data. The study established that IT literacy among the school managers had a major influence on the

adoption of IT in the administrative task areas. The study also discovered that the school managers who had adopted IT administration had participated in IT training programs in the course of their work. Nevertheless, it emerged that IT literacy was predominantly in financial management. This study however used a limited sample size and a different sampling procedure. The current study employed a larger sample size.

Hennessy, Onguko, Harrison, Ang'ondi, Namalefe, Naseem & Wamakote (2010) conducted a study entitled developing the use of IT to enhance learning in East African schools. They sampled public schools from Kenya, Uganda and Tanzania to participate in the study. The schools were required to indicate the extent to which they used IT in school programs specifically; instruction, evaluation and general school administration. The findings were that the larger schools in terms of population and resources integrated IT more than the smaller schools. The study noted that the greatest hindrance to IT use in schools was lack of critical infrastructure e.g. electricity and the computers. The schools also listed lack of experts to introduce IT in the schools as a challenge. The study recommended that governments should consider hiring computer technicians and deploying them to schools, if IT was to be fully integrated in school management and even in instruction. The current study attempted to validate these findings using Machakos County as the study locale.

## **2.5 Principal's social networks and use of IT in School Management**

According to MacVaugh and Schiavone (2010), the adoption of new technology can be usually falls within three domains just like most economic phenomena. The domains are the market/industry domain (macro domain), meso type dimension and the individual (micro) dimension. Social networking falls in the second domain. This alludes to the fact that humans are social beings and they do not exist in seclusion. Rather, they are surrounded by community and other societal systems. This therefore means that, people generally agree that they are constantly influenced by others within their communities. Lekhanya (2013) argues that the community in which one lives shapes their attitude towards the use of new systems. He attributes this to the argument that peoples' decision to use a technology takes into account the external impressions which include cultural principles and standards to which such people are subjected.

MacVaugh and Schiavone (2010) posit that in considering the domain of community of users before the adoption of a certain technology, the cost–benefit factors play a huge role. Another major reason is the impact on the prevailing social relations among the members of that community. A case in example is the technologies that are introduced within a community of workers and ends up changing how people relate among themselves. This implies that social networks that which favour being stable may not encourage their membership to adopt new technologies as opposed to the more risk taking and open networks, which may promote the adoption of new innovations.

Social networks consequently encompass the individual's value for the reference groups' subjective beliefs, and particular relational contracts which the person has entered with others, in specific social circumstances. Olise, Anigbogu, Edoko & Okoli (2014) posit that three basic conditions influence the social environment to which an individual chooses to belong; (social approval/disapproval); this happens if an individual joins with the hope to get acceptance from an individual or the whole group. Compliance; when the person accepts to be influenced so as to preserve a gratifying self-defining connection with others. Internalization; when an individual considers to be influenced since such influence is agrees with the value system held (Mazman, Usluel, & Çevik, 2009).

Mathipa & Mukhari (2014) evaluated factors that influence leaders to use IT in classroom instruction in South African urban schools. Descriptive survey was adopted for the study. The sample size was 1,240 participants drawn from 120 schools. Data were collected using a questionnaire. The study used simple random sampling to arrive at the sampled respondents. Descriptive statistics were used to present the study data including percentages and mean. The results showed a significant positive link between school infrastructure, social networks and IT adoption. This was reflected in the fact that where the headteachers had peers who adopted IT the headteachers also adopted it. Again, the teachers who had worked longer and were more experienced had adopted IT. This study was however conducted in urban South Africa where the urban schools have better IT infrastructure compared to rural schools such as those found in Machakos.

Ogundile and Okagbue (2014) studied the determinants of IT adoption in secondary schools in Nigerian schools. The study focused on 85 schools. The study objectives included: school type, personality related factors, leaders' social networks and staff exposure to IT. The study adopted a descriptive research design. Random sampling was used to arrive at a sample of 85 schools. Questionnaires and interview guides were the data collection instruments. Findings indicated that the major factors of IT adoption in schools were school type, government policy and school infrastructure. The findings also indicated that most National level and state schools used IT. The study however failed to link the principal's social networks with IT use. The current study attempted to provide this link.

## **2.6 Summary of Literature and Research Gaps**

The literature reviewed was in the four thematic areas namely, principal's personality, attitude, IT skills and social networks and their influence on the use of IT in the management of schools.

First, conceptual gaps were evident in that the available literature failed to link specific independent variables with the dependent variable e.g. in Ghavifekr, Afshari, Siraj & Seger (2013) and Albirini (2006).

Second, the review identified methodological gaps; some of the studies identified used correlational research design e.g. Weber (2012) and Ogachi (2015), while the current study used a descriptive research design.

Third, the review identified contextual gaps as seen in the study locale. The various studies identified were conducted in developed countries where education infrastructure is advanced e.g. Peralta and Costa (2017) and Neyland (2011). The current study therefore bridged these gaps by conducting a study on the principal's characteristics and use of information technology in public secondary school management in Machakos County, using the descriptive research design.

## **CHAPTER THREE**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **3.1 Introduction**

The chapter contains the methodology which was used to undertake the research. It gives the details of the research design, target population, sample size, sampling method, type of data, data collection, research instruments pre-testing, methods of data analysis and ethical considerations.

#### **3.2 Research Design**

The study adopted a correlational research design. This was done through the application of inferential statistics in the form of multiple linear regression analysis model. A correlational study determines whether any two study variables are related; whether an increase or decrease in one variable would lead to an increase or decrease in the other (Curtis, Comiskey & Dempsey, 2016). The design suited the study in that it helped to establish the influence of principals' personality, principal's attitude, principals' IT skills and the principals' social networks on the use of IT in school management in Machakos County without having to manipulate these variables (Kothari, 2014).

#### **3.3 Study Variables**

Use of IT in school management in secondary schools is the dependent variable while the independent variables of the study is principals' characteristics as indicated by the principals' personality, principals' attitude towards technology,

principals' IT skills and principals' social networks. The intervening variable was the principal's leadership style.

### **3.4 Location of the Study**

The study was carried out in Machakos County. The county is located West of Nairobi. As a requirement by the Ministry of education, schools are currently migrating to managing schools using IT, however focus has been mainly in the area of teaching and learning while the use of IT in school management seems to be neglected. Consequently, there is a considerable technological backwardness among secondary schools (Mwunda, 2014). A great deal of management duties in secondary schools are still carried out manually regardless of the IT policy of 2006 for administrators of secondary schools to use IT (Makewa, Meremo, Role & Role, 2013). This implies that the use of IT in school management has not been embraced fully (Mobegi, Ondigi & Oburu, 2010). It is common to find schools in Machakos County analysing results manually, filling report forms, writing hard copy letters to invite parents for school functions among other areas (Machakos County Education Office Report, 2018).

### **3.5 Target Population**

The target population was the 58 principals and the 868 teachers of the secondary schools using IT in school management in Machakos County.

## **3.6 Sample and Sampling Procedures**

### **3.6.1 Sampling Procedure**

The researcher used purposive sampling, stratified sampling and simple random sampling methods. Purposive sampling was used to identify 58 out of 153 schools in the county, which were using IT in school management. The purposive sampling technique is suitable for selecting individuals or groups who have knowledge or experience with a phenomenon of interest (Clark, 2019).

Stratified sampling was used to stratify the various schools in the county into various categories. These categories include National (4 schools), Extra County (9 schools), County (14 schools) and Sub-County schools (31 schools). According to Chandran (2014) stratified sampling helps achieve the desired representation from the various subgroups in the population.

Simple random sampling was used to select 173 teachers from a population of 868, and 13 principals from a population of 58. Simple random sampling is a method of sampling which provides equal opportunity and an unbiased representation of the population (Kothari, 2004). The sampling method was suitable for the study as the responses given could be generalized to the whole population.

### **3.6.2 Sample Size**

In a descriptive research, a sample size of 10-30% is acceptable (Mugenda & Mugenda, 2003). The study therefore adopted a sample size of 173 teachers (which is 20% of the teachers' population) and 13 principals (22% of principals' population) as summarized on Table 3.1

**Table 3.1: Sample size**

<b>School Category</b>	<b>No. of principals</b>	<b>20% sample</b>	<b>No. of teachers</b>	<b>20% sample</b>
National	4	1	121	24
Extra county	9	2	162	32
County	14	3	213	43
Sub-county	31	7	372	74
<b>Total</b>	<b>58</b>	<b>13</b>	<b>868</b>	<b>173</b>

### **3.7 Research Instruments**

Data were collected using the following tools:

#### **3.7.1 Questionnaires for Teachers**

Kombo and Tromp (2011) state that questionnaires are used by the researcher to collect information from large samples and varied regions. Structured questionnaires were administered to the teachers as the data collection tools. The questionnaire had both open and close ended questions together with Likert scale questions reflecting the study objectives (Chandran, 2014). Section A covered the general information, section B covered the principal's personality, section C covered the principal's attitude, section D covered principal's IT skills, section E covered the principal's social networks while section F covered the use of IT in school management.

#### **3.7.2 Interview Guide for the Principals**

Interviews are viewed by Kothari (2014) enabling the creation of rapport between informants and the researcher. An interview schedule was used as a guide to

interview the principals. The instruments contained open-ended and close-ended questions. The researcher conducted all the interviews.

### **3.8 Data collection**

#### **3.8.1 Pre-field Logistics**

Research authorization was sought from K.U. graduate school. Again, research permit was acquired from National Council for Science Technology and Innovation (NACOSTI) after the approval by the University. Further permissions to collect data were acquired from the CDE, Machakos County and also from the principals of the schools concerned.

#### **3.8.2 Field Logistics**

The researcher established rapport with school administrators and teachers before data collection. Before administering the questionnaires and the interview guide, permission was obtained from the principals of the affected schools. The informants were assured of confidentiality in handling the responses. The interview schedule was filled by the researcher during the interview sessions.

#### **3.8.3 Post-field Logistics**

After data collection, data cleaning was done. This included sorting the questionnaires to identify the incomplete ones from the ones which were used for analysis. Data coding then followed in readiness for analysis.

### **3.9 Pilot Study**

This involved checking for the suitability of the tools. The quality of research instrument determines the outcome of the study (May, 2011). Piloting establishes whether the instrument will measure the construct adequately; establish whether the respondents would have difficulties while responding to the questions; establish whether time allocated for collecting data is adequate (Kothari, 2014). A pilot study was undertaken to refine the research instruments.

A pilot study was carried out in 4 schools in Machakos County which did not form part of the study sample size. The questionnaires and the interview schedules were pre-tested using procedures similar to those of the actual day. This provided feedback on the clarity of the instruments and time taken by the respondents when answering the questionnaire items and also the feasibility of the study. The respondents in the piloting exercise were not included in the actual study. The school characteristics included a population of at least 15 teachers and a learner population of at least 300. They were also using IT in school management. They included one National school, one extra-county school, one county school and one sub-county school. The schools selected had similar characteristics as those participating in the actual study including the ones that were implementing the use of IT in school management.

### **3.10 Validity and Reliability of the Instruments**

#### **3.10.1 Validity**

Validity is the degree to which results from data analysis characterize the phenomena being studied (Kothari, 2014). As Kothari points out, the easiest way of ensuring validity in an instrument is to use two different instruments which measure the same concept and compare the findings (data triangulation). In this study, the two instruments were the questionnaire and the interview guide. The questionnaires and the interview guides were piloted using procedures identical to those used during the actual study. The questions were then revised and adjusted accordingly. This helped to improve the validity of the instruments. The data collected from each tool were also triangulated.

#### **3.10.2 Reliability**

According to Kothari (2014), for data to be reliable the data collection techniques must yield information that is both relevant and correct. As such, reliability is a measure of this 'relevance' and 'correctness'. The study used the test-retest technique in order to ensure reliability of the data collected. This involved administering the questionnaires twice to the same respondents in an interval of one week and results compared to ascertain whether the responses would be the same. The coefficient of correlation was determined using the Pearson Product moment formula to find out if the contents of the questionnaires were dependable in prompting the same responses whenever the tool was administered. Orodho (2005) points out that a correlation co-efficient ranging from 0.75 to 1 indicates a strong

positive relationship between variables. The current study had a correlation coefficient of 0.79.

### **3.11 Data Analysis**

The study used primary data, both qualitative and quantitative in nature. Data from the questionnaires were cleaned, then coded and entered into the SPSS template. The quantitative data was analysed using descriptive statistics where mean and standard deviation frequencies and percentages were applied for the quantitative variables (Kothari, 2004). The unit of data analysis was the school. To determine the influence of principals' characteristics on the use of information technology in secondary school management, correlation analysis was used. This was done with the help of SPSS version 22. Tables, figures, charts and other graphs were generated as appropriate to present the data findings.

Qualitative data analysis approach was used to analyse data collected through interviews. The recorded data was transcribed i.e. converted into a written or electronic text document. The responses were then grouped on the basis of the research objectives and discussed in line with the available literature. The qualitative data were presented as narratives and verbatim quotes.

### 3.11.1 Data Analysis Plan

**Table 3.2: Data Analysis Plan**

<b>Objective</b>	<b>Nature of data</b>	<b>Statistical technique</b>	<b>Mode of presentation</b>
To establish the influence of principals' personality on the use of information technology in public secondary schools management	Quantitative	Inferential statistics (correlation), Descriptive statistics (Mean, percentages)	Tables, Figures
	Qualitative	Qualitative data analysis	Narration, verbatim quotations
To establish how the principal's attitude towards IT influences the use of information technology in public secondary schools management	Quantitative	Inferential statistics (correlation), Descriptive statistics (Mean, percentages)	Tables, Figures
	Qualitative	Qualitative data analysis	Narration, verbatim quotations
To explore how the principals' IT skills influence the use of information technology in public secondary schools management	Quantitative	Inferential statistics (correlation), Descriptive statistics (Mean, percentages)	Tables, Figures
	Qualitative	Qualitative data analysis	Narration, verbatim quotations
To explore how the principals' IT skills influence the use of information technology in public secondary schools management	Quantitative	Inferential statistics (correlation), Descriptive statistics (Mean, percentages)	Tables, Figures
	Qualitative	Qualitative data analysis	Narration, verbatim quotations

### **3.12 Logistical Considerations, Human Relations and Ethical Issues**

#### **3.12.1 Logistical Considerations**

In this study, the researcher obtained authority to conduct research from Kenyatta University. A research permit from the National Council for Science Technology and Innovation was also obtained before the research commenced. Approval was also sought from the management of the schools where data collection was conducted.

#### **3.12.2 Human Relations and Ethical issues**

Ethical considerations included voluntary participation and informed consent from the respondents. This was done to protect the confidentiality and anonymity of the subjects (May, 2011). Informants were further requested to omit their names on the questionnaires to ensure anonymity. Also during data analysis, all data from the different schools was treated as one and at no point was individual school data isolated. The conclusions therefore refer to the population and not individual schools. Human relations considerations included the researcher liaising with colleague teachers to stand in for them at the work place as they proceeded for the data collection exercise.

**CHAPTER FOUR**  
**PRESENTATION OF FINDINGS, DISCUSSION AND**  
**INTERPRETATION**

**4.1 Introduction**

This chapter presents the findings, interpretations and discussion according to the research objectives. The analysis was guided by the study objectives. The main thematic areas were principals’ personality, principal’s attitude, principals’ IT skills and principals’ social networks. The chapter also provides the general and demographic information of the respondents. The study set out to investigate the influence of principals’ characteristics and the use of Information Technology in school management Machakos County, Kenya.

**4.2 General and Demographic Information**

**4.2.1 Questionnaire Return Rate**

The 173 questionnaires were distributed to the teachers, filled and then collected. However, only 159 were completed and returned. The return rate was as shown on Table 4.1

**Table 4.1: Return rate**

<b>Return rate</b>	<b>Questionnaires</b>		<b>Interview Guides</b>	
	<b>F</b>	<b>%</b>	<b>F</b>	<b>%</b>
Complete	159	92	58	100
Incomplete	14	8	0	0
<b>Total</b>	<b>173</b>	<b>100</b>	<b>58</b>	<b>100</b>

**Source: Research data (2022)**

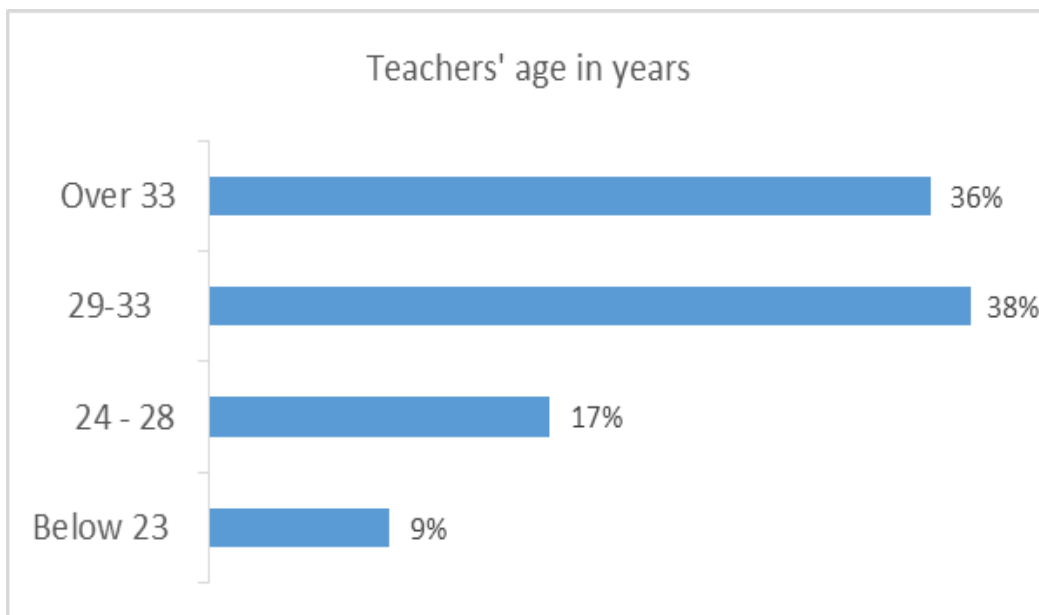
From Table 4.1, the researcher distributed 173 questionnaires to the teachers. They completed and returned 159 questionnaires, being a response rate of 92%. Interviews were also conducted on all the 58 principals. The response rate was therefore 100%. This response was adequate for analysis and conforms to Mugenda and Mugenda (2003) who stipulate that a response rate of 50% is adequate for analysis and reporting, a rate of 60% is good while 70% and over is excellent.

### 4.3 Demographic Information

In order to determine the suitability of the teachers as study respondents, their demographic information which included age, gender, length of work experience and school category were sought and analysed as indicated.

#### 4.3.1 Age of Teachers

The study sought to find out the age of the teachers and the findings are as shown on Figure 4.1



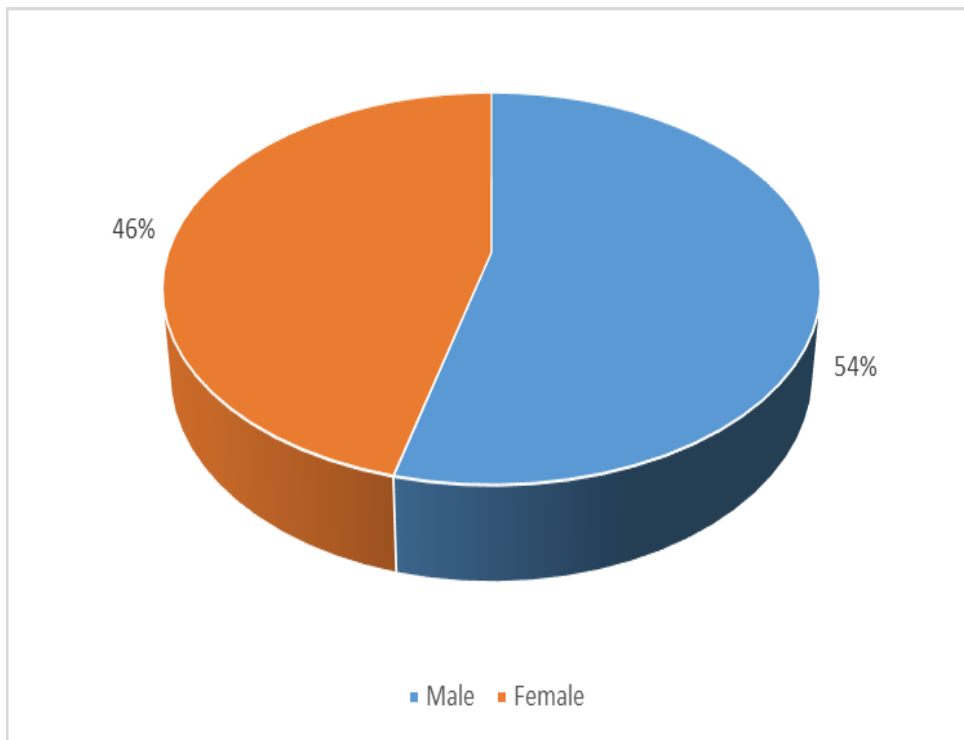
**Figure 4.1: Teachers age**

**Source: Research data (2022)**

From Figure 4.1, few teachers (9%, n=14) were aged under 23 years, 17%, (n=27), were aged 24-28 years, 38%, (n=61), were aged between 29-33 years, while 36%, (n=57) were aged over 33 years of age. This implied that all the teachers were above 18 years and were therefore suitable respondents of the study. Further, the older the teachers, the more likely they were likely to use technology.

#### 4.3.2 Teachers' Gender

The study also sought to find out the teachers' gender and recorded the findings as shown on Figure 4.2



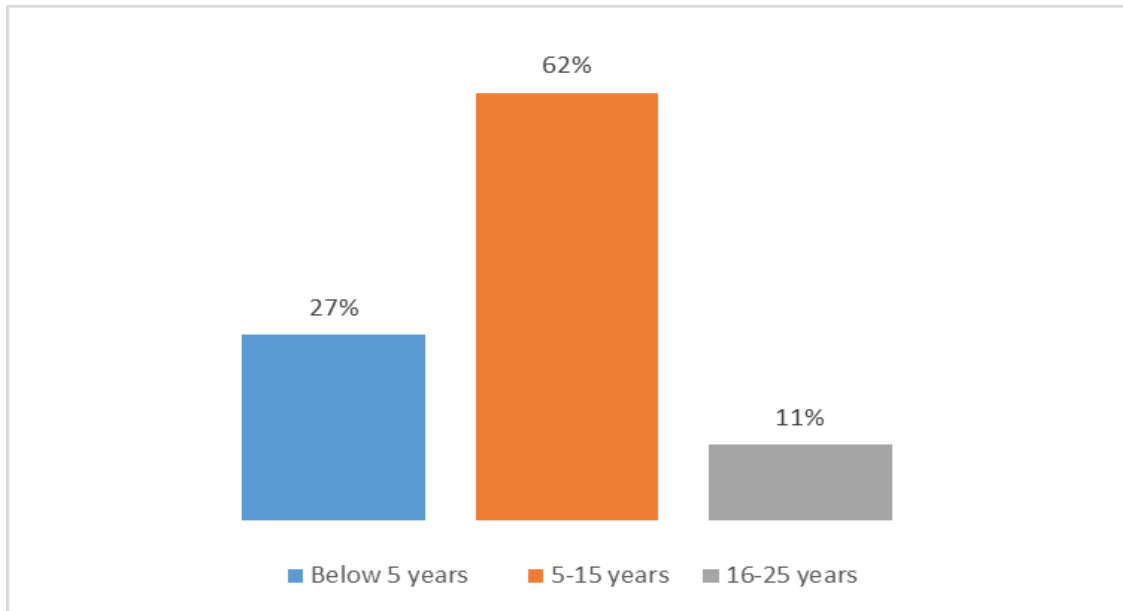
**Figure 4.2: Teachers' gender**

**Source: Research data (2022)**

From Figure 4.2, majority of teachers (54%, n=86) were male while 46%, (n=73) were female respectively. This implied that there was gender disparity among teachers in Machakos County.

### 4.3.3 Length of Work Period

The study sought to find out the length of work period of the teachers and recorded the findings as shown on Figure 4.3



**Figure 4.3: Length of work period**

**Source: Research data (2021)**

From Figure 4.3, majority (62%) of the teachers had worked in their current schools for 5-15 years, 27% had worked for below 5 years, while 11% had worked for 16-25 years. This implied that all the teachers had worked in their respective schools long enough to understand the issue of use of IT in school management and as such were suitable respondents for the study. Again, the teachers who had worked for 16-25 years were more likely to be found in larger schools. Perhaps this was because the larger schools (mainly National, Extra-County and County) in which the longer serving teachers were found, were able to mobilize the requisite resources to install IT infrastructure compared to smaller schools, which also seemed to have younger teachers. The findings are also reflected by those of Mathipa and Mukhari (2014)

who discovered that teachers who had worked longer and were more experienced had adopted IT.

#### 4.3.4 School Category

The study sought to find out the categories of the various schools and recorded the findings as shown on Table 4.2

**Table 4.2: Type of School**

<b>Type of school</b>	<b>F</b>	<b>%</b>
National	4	7
Extra county	9	16
County	14	24
Sub-county	31	53
<b>Total</b>	<b>58</b>	<b>100</b>

**Source: Research data (2021)**

From Table 4.2 Machakos County had all the categories of public secondary schools in the country. The study also discovered that all the 4 National and 9 Extra-county schools sampled were using IT in school management. Perhaps this was due to the fact that the larger schools were endowed with more resources and were therefore able to put in place the requisite IT infrastructure. These findings are supported by those of Ogundile and Okagbue (2014) who argue that the major factors of IT adoption in schools were school type, government policy and school infrastructure where most national and state level secondary schools in Nigeria used IT.

#### **4.4 Findings on the influence of principal's personality on the use of IT in school management**

The first objective of the study was to establish the influence of principal's personality on the use of IT in school management. Teachers were consequently asked to show their degree of concurrence with declarations on the principal's personality. Their reactions were graded on a 5 point Likert scale where: 5 - Strongly Agree, 4 - Agree, 3 - Neutral, 2 – Disagree and 1 - Strongly Disagree. The mean and standard deviations were generated from SPSS as illustrated on Table 4.4. A mean range of 1-2.5 meant Disagree, 2.5 – 3.5 meant Neutral while 3.5 - 5 meant Agree. A standard deviation of 0.0000 meant unanimous agreement on a certain statement while figures above 0.0000 showed varying degrees of agreement with the same statement.

**Table 4.3: Teachers' opinions on the influence of principal's personality on the use of IT in school management**

<b>Statement</b>	<b>Mean</b>	<b>Std. Dev</b>
The principal is always open to new innovations especially those related to technology	4.5217	0.8630
The principal is achievement oriented and always wants to complete whichever project he starts	4.3436	0.0440
The principal prefers uniqueness and is always trying out new ideas in IT that can make work easier	4.3213	0.6373
The principal does not allow others access to IT equipment in the school	3.9031	0.3393
The principal allows all members of staff to access the IT equipment in the school	3.8148	0.7868

The study findings indicate that the teachers generally agreed that their principal was always open to new innovations especially those related to technology (Mean 4.5217). This implied that the principals were objective about technology and readily accepted new innovations in technology. Being open minded towards technology is paramount given the continuous changes in technological innovations happening daily since they are meant to make work easier. The findings agree with those of Lo (2014) who identifies the novelty seeking trait, usually connected to sensory activities that bring about stimulation, spontaneous decision making and overindulgence. This pre-disposition to watch out for new ideas, goods and services, involves changes in one's motivation to pursue originality and thus governs the acceptance of innovative products (Adiele, 2012).

The respondents were also in agreement that the principal is achievement oriented and always wants to complete whichever project he starts (Mean 4.3436). This implied that the principal recognizes the contribution of IT in self-efficacy. Efficacy means that one is able to complete what they have started thereby conserving the available resources which can then be redirected to where there is a shortage. These findings resonate with those of Saleem, Beaudry and Croteau (2011) who posit that self-efficacy is characterized as confidence in one's own capacities to perform an activity that is important in accomplishing an objective or a task. This implies that self-efficacy is the certainty that an individual has in his/her capacity to do the things that he/she tries to do. This subsequently implies that a worker's self-efficacy considers the views of the person utilizing technology and innovation and on how far the individual recognizes accomplishment as being under their control.

The respondents also agreed that the principal is innovative and always trying out new ideas in IT that can make work easier (4.2148). This implied that the principals underscored the importance of being innovative and thereby becoming unique through use of IT. The findings are corroborated by Manu (2012) who indicates that in reference to the uniqueness theory, there are individuals who find high levels of resemblance and variation unpleasant and consequently endeavour to become distinct from their peers. The greater the degree of their perception of similarity with others, the greater their desire to be unique thus they seek for new ideas. In this case therefore, the more the individual exhibits these traits that is, novelty and desire for uniqueness, the more likely they are to adopt new innovations compared to those with less of the traits. The respondents however disagreed that the principal did not allow others access to IT equipment in the school (1.2031). Also closely related to that finding is the finding that the principal allows all members of staff to access the IT equipment in the school. This implied that the principals underscored the important role played by allowing others access to IT so that they can also be empowered. When more people have access to IT equipment, it means then that more tasks can get done at. The findings were similar to those of Neyland (2011) who evaluated the role of state senior school principals as leaders of technology adoption in Australia. The study noted that the decision to use IT in the school lay with the willingness of the principal to adopt it and allowing other members of staff access to it. Further, teachers in the school expected the leader to guide them in the areas of IT use.

The principals also indicated that their personality greatly influenced their use of technology in school management. One of the lady informants [P01] from Mumbuni secondary school in Kangundo sub-county commented;

The adoption of technology, just like other areas of life is greatly influenced by personality traits. For example, a person who is averse to change is unlikely to adopt technology especially because it keeps on changing. But if you are achievement oriented and want to complete projects in record time, then you must adopt technology. I use technology all the time in sending report forms to parents, inviting them for meetings and even circulating the minutes of previous meetings, it saves me time and resources which can in turn be used elsewhere. [A lady principal from Mumbuni secondary school in Kangundo sub-county, March 2022].

These findings indicated that the principals also concurred on the key role played by personality in the use of IT in school management. These findings are corroborated by those of Den Ouden (2011) who posits that owing to the fact that people react in different ways in response to new ideas, practice, or objects based on differences in their personalities, the same applies to their response towards innovations. Again, Weber (2012) argues that the main factors critical to the adoption of IT in school management includes the leaders' exposure to IT, teachers' willingness to use IT and the school manager's personality.

#### **4.5 Findings on the influence of principal's attitude on the use of IT in school management**

The second objective of the study was to establish the influence of principal's attitude on the use of IT in school management. Teachers were consequently asked to show their degree of concurrence with declarations on attitude. Their reactions were graded on a 5 point Likert scale where: 5 - Strongly Agree, 4 - Agree, 3 -

Neutral, 2 – Disagree and 1 - Strongly Disagree. The mean and standard deviations were generated from SPSS as illustrated on Table 4.5. A mean range of 1-2.5 meant Disagree, 2.5 – 3.5 meant Neutral while 3.5 - 5 meant Agree. A standard deviation of 0.0000 meant unanimous agreement on a certain statement while figures above 0.0000 showed varying degrees of agreement with the same statement.

**Table 4.4 Respondents’ opinions on the influence of principal’s attitude on the use of IT in school management**

<b>Statement</b>	<b>Mean</b>	<b>Std. Dev</b>
The principal believes in adopting technology to ease the performance of administrative tasks	4.1212	.1136
The principal is very helpful and supportive in introducing new technology in the school	4.3273	.2099
The principal keeps on emphasizing the need for adopting technology to make work easier	4.8061	.0163
The principal encourages teachers to enroll for IT classes to improve their skills	4.6515	.1072

From the study findings, the respondents agreed that the principal keeps on emphasizing the need for adopting technology to make work easier (Mean 4.8061). This implied that the respondents were aware of the positive attitude towards technology that their principal had as seen through his emphasis on using technology to make work easier.

Closely related to this finding was the finding that the principal encourages teachers to enrol for IT classes to improve their skills (4.6515). This implies that the principal

underscores the need to have more teachers familiarize with and use technology as he considers it a useful tool in management. These findings are similar to those of Mingaine (2013) who posits that in order for full implementation of IT, the implementors must have positive attitudes towards the solution of the challenges that they come across while implementing IT projects in secondary schools. Further, Al Sharija and Watters (2012) argue that the principals who favoured IT adoption were those with a positive attitude towards technology. These individuals were provided a lot of training during the introduction of useful technology in performing tasks in school administration, specifically tasks which involved them directly.

The respondents also agreed that the principal was very helpful and supportive in introducing new technology in the school (Mean 4.3273). This finding was closely connected to another which states that the principal believes in adopting technology to ease the performance of administrative tasks (Mean 4.1212). This implied that the respondents had noted how far their principal appreciated how technology made work easier and therefore had adopted its use. These findings are corroborated by Ghavifekr, Afshari, Siraj & Seger (2013) who state that the principals' attitude towards the use of IT in classroom management has a major influence on the decision to use IT and even the choice of technology to use. Further, the principal's perceived ease of use of certain technology and the usefulness of that innovation in classroom management has a major influence on the decision to adopt and use it. The principals also underscored the influence of attitude towards IT use in school management. One of the male informants [P02] from Masinga secondary school in Masinga sub-county commented;

I always use technology since it makes my work easier as an administrator. Take for example the analysis, and dissemination of examination results to the parents. With only the touch of a button all parents get the results even before the learners can get home. I've always been attracted to technology and therefore wherever and whenever I can use it, I always use it in management. I would use technology any day any time. The use of IT has minimized the cases of parents complaining that they never received the results of their children or even not receiving letters inviting them for meetings; I send text messages en masse and they all receive them. I would say that attendance has improved since we adopted technology. I would say my attitude towards the use of IT is greatly shaped by the cultural background I came from. I've interacted with technology since I was young and I'm always excited to use it. [A male principal from Masinga Secondary school in Masinga Sub-county, March 2022]

These findings are supported by Lee, Trimi and Kim (2013), who posit that the principal's attitudes towards IT are attributable to their cultural sensitivities. This means that the attitudes of these principals were shaped by their culture, which acts as the blueprint for societal standards. If an individual hails from a culture that easily embraces change and innovation in technology, then the individual will be more willing to adopt the use of technology in the school and the reverse is also true. The cultural background of the principal in this sense has a major influence on the adoption of IT in school management.

#### **4.6 Findings on the influence of the Principal's IT skills on the use of IT in school management**

The third objective of the study was to explore the influence of principal's IT skills on the use of IT in school management. Teachers were consequently asked to show their degree of concurrence with declarations on the subject. Their reactions were graded on a 5 point Likert scale where: 5 - Strongly Agree, 4 - Agree, 3 - Neutral, 2 – Disagree and 1 - Strongly Disagree. The mean and standard deviations were

generated from SPSS as illustrated on Table 4.6. A mean range of 1-2.5 meant Disagree, 2.5 – 3.5 meant Neutral while 3.5 - 5 meant Agree. A standard deviation of 0.0000 meant unanimous agreement on a certain statement while figures above 0.0000 showed varying degrees of agreement with the same statement.

**Table 4.5: Respondents’ opinion on the influence of the principal’s IT skills on the use of IT in school management**

<b>Statement</b>	<b>Mean</b>	<b>Std. Dev</b>
The principal has requisite skills in use of computer and internet	4.9091	0.2278
The principal has taken the lead role in ensuring training in e-mails and internet use and its integration in the school	3.7576	0.4257
The principal does candidates’ online registration on his own	4.8065	0.2369
The school is equipped with IT facilities which helps the principal to do exams analysis using IT	4.6818	0.1389
The principal uses web-based services to communicate with parents and other stakeholders	3.8636	0.4020

The study findings indicated that the respondents agreed that the principal had the requisite skills in use of computer and internet (Mean 4.9091). Closely related to that was the finding that the principal does candidates’ online registration on his own (4.8065). This implied that the respondents were aware of the paramount role played by the possession of IT skills in influencing its use. The findings are related to those of Wanjala, Khaemba and Mukwa (2011) who assert that the effective implementation of instructional innovations require sufficient preparation to allow leaders to confidently integrate IT in technical tasks. They further argue that the

success of such integration into the management of schools in developing countries like Kenya largely depends on whether the managers and teachers have received adequate preparations to use computers during their training. When adequately prepared, the school managers' capacity to choose, assimilate and assess technology tools to ease school management improves.

The respondents also agreed that the school was equipped with IT facilities which helps the principal to do exams analysis using IT (Mean 4.6818). This implied that the principal is cognizant of the fact that the facilities must be put in place in order to be used. Also the respondents agreed that the principal uses other web-based services to communicate with parents and other stakeholders (3.8636). This implied that the principal had acquired the requisite IT skills to be able to adequately integrate it in management. Further, the informants were in agreement that the principal had taken the lead role in ensuring training in e-mails and internet use and its integration in the school (3.7576). This implied that the principals also had prioritized implementation and use of technology in their institutions.

The findings are consistent with those of Al-Zaidiyeen, Mei and Fook (2010) who stated that proper pre-service teacher education can provide a good chance for experimenting with technology even before it has been adopted in school administration. The absence of focus on IT in pre-service teacher education has been an obstacle to the school managers' use of IT. This implies that in the absence of effective training on educational technology, teachers are unable to use IT resources for the adoption in school management. The study further asserts that prior IT skills

have to be acquired by the school principals if IT integration in management is to succeed. Again, Ogachi (2015) argues that the school managers who had adopted IT administration had participated in IT training programs in the course of their work.

The principals also agreed that the possession of IT skills were a major influence on the adoption of technology in management. One female principal P03] noted;

I would say that I have reasonable IT skills which helps me in completing basic tasks in school management. I've used IT for as long as I've been a school manager and I would say the future of school management is in technology. It has made management easy. Take for example the financial management software, I do not need to be an accountant to understand the statements. I do not need to visit the stores or the boarding section to know what is happening there. This information is available at the click of a mouse. The greatest motivation I had while introducing the use of IT was the skills I had acquired over the years; in any case you cannot use what you do not have. A lady principal from Ndalani secondary school in Tala sub-county, March 2022].

This finding implied that the principals affirmed the role of prior IT skills in school management. The finding is supported by that of Wanjala, Khaemba & Mukwa (2011) who affirm that the managers' knowledge, skill and philosophy influences the IT adoption approaches. The effective implementation of instructional innovations requires sufficient preparation to allow leaders to confidently integrate IT in technical tasks.

#### **4.7 Findings on the influence of the principal's social networks on the use of IT in school management**

The fourth objective of the study was to establish the influence of the principals' social networks on the use of information technology in public secondary schools' management. Teachers were consequently asked to show their degree of

concurrence with declarations on the subject. Their reactions were graded on a 5 point Likert scale where: 5 - Strongly Agree, 4 - Agree, 3 - Neutral, 2 – Disagree and 1 - Strongly Disagree. The mean and standard deviations were generated from SPSS as illustrated on Table 4.6. A mean range of 1-2.5 meant Disagree, 2.5 – 3.5 meant Neutral while 3.5 - 5 meant Agree. A standard deviation of 0.0000 meant unanimous agreement on a certain statement, while figures above 0.0000 showed varying degrees of agreement with the same statement.

**Table 4.6: Opinions on the influence of the principal’s social networks on the use of IT in school management**

<b>Statement</b>	<b>Mean</b>	<b>Std. Dev</b>
Regular bench-marking with reference groups around our school has influenced the school’s extent of IT use	4.2273	.7399
The adoption of IT has made the school community feel part of a larger community of schools using IT	4.8061	.8063
IT integration in the school has improved communication and relations with the community	3.9515	.8272
The friendly schools around the County seem to have a great influence on the extent of IT adoption in the school	4.1091	.7227
The cultural values and norms around the community where the school is found seems to favour the adoption of IT	2.1621	.6136

From Table 4.6, the study findings indicated that the respondents were in agreement with the following opinions on the influence of the principal’s social networks on the use of IT in school management; the school’s adoption of IT has made the school community feel part of a larger community of schools using IT (Mean 4.8061). Again, regular bench-marking with reference groups (schools using IT)

around our school has influenced the school's extent of IT use (Mean 4.2273). Also related to these findings is that the friendly schools around the County seem to have a great influence on the extent of IT adoption in the school (Mean 4.1091). This implied that the principals' adoption of IT in school management was influenced by the feeling of being part of an IT community. These findings are echoed by Lekhanya (2013) who argues that the community in which one lives, shapes their attitude towards the use of new systems. The study attributes this to the argument that peoples' decision to use a technology takes into account the external impressions which include cultural principles and standards to which such people are subjected.

These findings are also echoed by MacVaugh and Schiavone (2010) who note that the adoption of new technology can be usually falls within three domains just like most economic phenomena. The domains are the market/industry domain (macro domain), meso type dimension and the individual (micro) dimension. Social networking falls in the second domain. This alludes to the fact that humans are social beings and they do not exist in seclusion. Rather, they are surrounded by community and other societal systems. This therefore means that, people generally agree that they are constantly influenced by others within their communities.

Again, Olise, Anigbogu, Edoko and Okoli (2014) argue that social networks consequently encompass the individual's internalization of the reference groups' subjective beliefs, and particular relational contracts which the person has entered with others, in specific social circumstances. They posit that three basic conditions

influence the social environment to which an individual chooses to belong; (social approval/disapproval); this happens if an individual joins with the hope to get acceptance from an individual or the whole group. Compliance; when the person accepts to be influenced so as to preserve a gratifying self-defining connection with others. Internalization; when an individual considers to be influenced since such influence is agrees with the value system held (Mazman, Usluel, & Çevik, 2009).

The respondents also agreed that IT integration in the school had improved communication and relations with the community (Mean 3.9515). This implied that the use of IT in school management had impacted the community around the school. Perhaps this was because of the efficiency associated with technology in reaching more people in a short time. The finding is supported by MacVaugh and Schiavone (2010) who argue that another major reason why people adopt technology is the impact on the prevailing social relations among the members of that community. A case in example is the technologies that are introduced within a community of workers and ends up changing how people relate among themselves. This implies that social networks which favour being stable may not encourage their membership to adopt new technologies as opposed to the more risk taking and open networks, which may promote the adoption of new innovations.

Nevertheless, the respondents did not agree with the view that the cultural values and norms around the community where the school is found seems to favour the adoption of IT (Mean 2.1621). This implied that the respondents didn't consider the community around the school supportive of technological innovations. Perhaps this

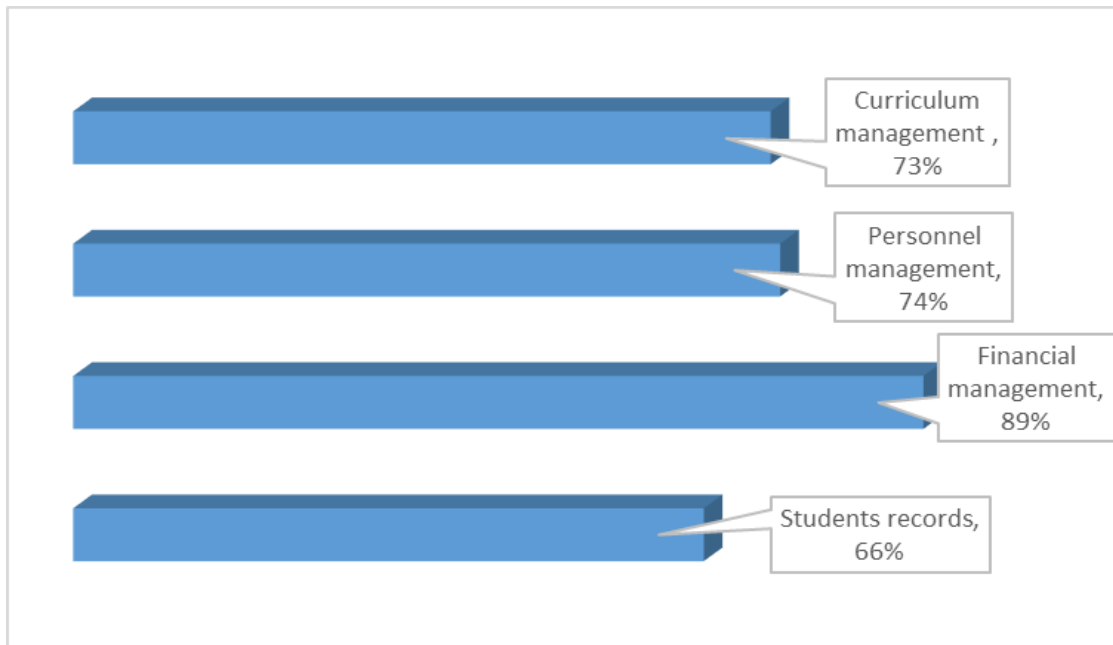
was because of the general poor intake of technology in school management in the schools around them. This finding contrasts that of MacVaugh and Schiavone (2010), who argue that the domains that influence technology uptake include social networking which alludes to the fact that humans are social beings and they do not exist in seclusion. Rather, they are surrounded by community and other societal systems. This therefore means that, people generally agree that they are constantly influenced by others within their communities. A male principal [P04] had this observation to make:

Technology uptake is greatly influenced by social networks. Humans are social beings and as such, they always imitate best practices in use elsewhere. Therefore, it is true that I am influenced by peers especially in this county. Since most of the schools receive almost similar funding, we usually benchmark with colleagues and adopt what works for them; this includes technology. I first saw the school administration software in a school in this county and I thought it was a good idea, eventually I procured it and it is in use today. A male principal from Ndithini secondary school in Tala sub-county, March 2022].

The findings indicate that the principals influenced each other in matters of using IT in school administration. The findings are corroborated by those of Mathipa and Mukhari (2014) who evaluated the factors that influence leaders to use IT in classroom instruction in South African urban schools. The results showed a significant positive link between social networks and IT adoption. This was especially reflected in the fact that where the headteachers had peers who had adopted IT in managing their schools, they also adopted IT in management.

#### 4.8 Use of IT in School Management

The study sought to establish the areas where IT is used in school management and recorded the findings as shown on Figure 4.4



**Figure 4.4: Areas of use of IT in school management**

**Source: Research Data**

From Figure 4.4, 88% (n=51) of the principals used IT in financial management, 72% (n= 42) in personnel management, 78% (n=45) in curriculum management while 66% (n=38) used IT in student records. This implied that indeed IT was in use in the schools and that the principals used IT in the key areas of school management. The findings are echoed by those of Githagu (2017) who states that in personnel management the principal can use IT to ensure an efficient way of guaranteeing that personnel within an organization are drafted, hired and paid while providing a work environment that promotes work performance and attaining goal. Additionally, Ibrahim (2016) argues that the school managers also monitor learner records,

curriculum and financial management, provision of resources, both educational and human while availing finances to run the school. IT has therefore provided a number of programs that has eased the management of and monitoring the school activities with the touch of a button.

## 4.9 Inferential Statistics

### 4.9.1 Correlation Analysis

Pearson Correlation Coefficient was used to test the relationship between the dependent variable (use of IT in school management) and independent variables (principals' personality, attitude, IT skills and social networks) of the study at 95% confidence level or at 5% level of significance. The results are as shown on Table 4.7.

**Table 4.7: Correlation Matrix**

	Use of IT	Personality	Attitude	IT skills	Social networks
Use of IT (r)	1.000				
(p) Sig. (2 tailed)					
Personality (r)	0.381	1.000			
(p) (2 tailed)	.079				
Attitude (r)	0.415	0.221	1.000		
(p) Sig. (2 tailed)	.037	0.156			
IT skills (r)	0.483	0.271	0.199	1.000	
(p) Sig. (2 tailed)	.029	0.118	0.337		
Social networks (r)	0.606	0.314	0.162	0.272	1.000
(p) Sig. (2 tailed)	.018	0.163	0.177	0.201	

\*Correlation is significant at the 0.05 level (2-tailed)

**Source: Research data (2021)**

Results (as illustrated on Table 4.8) illustrate that there was a significant positive relationship between principal's personality and use of IT in school management

(rho = 0.381, p-value 0.079 which is less than 0.05); a significant positive correlation between personality traits and use of IT in school management. This implied that an improvement in personality traits is associated with increased use of IT in school management in Machakos County.

The findings also indicated a significant positive relationship between principal's attitude and use of IT (rho = 0.415, p-value 0.037 which is less than 0.05); a significant positive correlation between attitude and use of IT in school management implying that an improvement in attitude was associated with increased use of IT in school management in Machakos County.

Further, the findings indicated that there was a significant positive relationship between principals' IT skills and use of IT (rho = 0.483, p-value 0.029), which is less than 0.05); a significant positive correlation between IT skills and use of IT in school management implying that an improvement in IT skills acquisition by the principals was associated with increased IT use in school management in Machakos County. Lastly, the findings indicated a significant positive relationship between the principals' social networks and use of IT in school management in Machakos County (rho = 0.606, p-value 0.018 which is less than 0.05), a significant positive correlation between increased social networks and use of IT in school management. This implied that an increase in the principals' social networks was associated with increased use of IT in school management in Machakos County.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter incorporates the summary of findings, conclusions, recommendations and suggested areas for further study.

#### **5.2 Summary of Findings**

This section summarizes the key findings, discussion and interpretation on the influence of principals' characteristics and the use of information technology in school management in public secondary schools in Machakos county. The findings have been summarized according to the study objectives. The study discovered that the principals' personality, attitude, IT skills and the social networks positively influence the use of IT in school management in Machakos County.

##### **5.2.1 Influence of principal's personality on the use of IT in school management**

The study findings indicated that the principals' personality influenced the use of IT in school management in that the principals were always open to new innovations, were objective about technology, were achievement oriented and always wanted to complete whichever project they started, were always trying out new ideas in IT and they allowed others access to IT equipment in the school. Correlation analysis also indicated a significant positive relationship between principal's personality and use of IT in school management.

### **5.2.2 Influence of principal's attitude on the use of IT in school management**

The study findings indicated that the principals' attitude influenced the use of IT in school management as they kept on emphasizing the need for adopting technology to make work easier, they encouraged teachers to enroll for IT classes to improve their skills, were very helpful and supportive in introducing new technology and they kept adopting technology to ease the performance of administrative tasks. Further, correlation analysis also indicated that the principals' attitude had a significant positive influence on use of IT in school management.

### **5.2.3 Influence of the principal's IT skills on the use of IT in school management**

The study findings indicated that the principals' IT skills influenced the use of IT in school management in that the principals had the requisite skills in use of computer and internet, the principal did candidates' online registration on their own, the school was equipped with IT facilities which helped the principal to do exams analysis using IT, the principal used other web-based services to communicate with parents and other stakeholders and that the principal had taken the lead role in ensuring training in e-mails and internet use and its integration in the school. Again, correlation analysis indicated that the principals' IT skills had a significant positive influence on IT use in school management.

#### **5.2.4 Influence of the principals' social networks on IT use in school management**

The study findings indicated that the principals' social networks influenced the use of IT in school management as there was agreement with the following perceptions; the school's adoption of IT had made the school community feel part of a larger community of schools using IT, regular bench-marking with reference groups (schools using IT) around our school had influenced the school's extent of IT use, friendly schools around the County seemed to have a great influence on the extent of IT adoption in the school and that IT integration in the school had improved communication and relations with the community. However, they disagreed that cultural values and norms around the community where the school was found seemed to favour the adoption of IT. Further, correlation analysis indicated that there was a significant positive relationship between the principals' social networks and IT use in school management.

### **5.3 Conclusions**

#### **5.3.1 Influence of principal's personality on the use of IT in school management**

The study revealed that the principal's personality influenced use of IT in school management. This was in form of adopting new innovations, being objective about technology, being achievement oriented, always trying out new ideas in IT and allowing others access to IT equipment in the school. Correlation analysis also indicated a significant positive relationship between principal's personality and use

of IT in school management. The study therefore concludes that the principals' personality positively influenced use of IT in school management.

### **5.3.2 Influence of principal's attitude on the use of IT in school management**

The study revealed that the principals' attitude influenced the use of IT in school management as the principals emphasized the need for adopting technology to make work easier, encouraging teachers to enrol for IT classes to improve their skills, being helpful and supportive in introducing new technology and they kept adopting technology to ease the performance of administrative tasks. Correlation analysis also indicated that the principals' attitude had a significant positive influence on use of IT. The study concludes that the principals' attitude positively influenced use of IT in school management.

### **5.3.3 Influence of the principal's IT skills on the use of IT in school management**

The study revealed that the principals' IT skills influenced the use of IT in school management as they had the requisite skills in use of computer and internet, the principal did candidates' online registration on their own, the schools were equipped with IT facilities which helped the principal to do exams analysis using IT, the principal used other web-based services to communicate with parents and other stakeholders and that the principal had taken the lead role in ensuring training in e-mails and internet use and its integration in the school. Correlation analysis indicated that the principals' IT skills had a significant positive influence on IT. The study concludes that the principals' IT skills positively influenced transition.

### **5.3.4 Influence of the principals' social networks on IT use in school management**

The study revealed that the principals' social networks influenced the use of IT in school management since the school's adoption of IT had made the school community feel part of a larger community of schools using IT, regular benchmarking with reference groups (schools using IT) around our school had influenced the school's extent of IT use, friendly schools around the County seemed to have a great influence on the extent of IT adoption in the school and that IT integration in the school had improved communication and relations with the community. However, they disagreed that cultural values and norms around the community where the school was found seemed to favour the adoption of IT. Correlation analysis indicated a significant positive relationship between the principals' social networks and IT use in school management. The study concludes that the principals' social networks positively influenced use of IT in school management.

### **5.4 Recommendations**

From the above findings, the following recommendations are suggested;

- i Since the principals were open to using IT in school management, the government through the Ministry of Education should enhance the provision of IT resources in schools so the schools can take advantage of the benefits IT offers.
- ii Since the principals' IT skills influence the adoption of technology, the Ministry of Education should consider sponsoring principals in IT courses in

order to improve their skills and thereby enhance IT usage in school management.

- iii Since the principals' social networks influences use of IT, the schools should strive to build partnerships with both government and the community in order to broaden their networks so they can compare notes while adopting the best practices to their schools.

### **5.5 Areas for Further Research**

Further research should be conducted to

- i Since this study covered the influence of principals' characteristics on the use of information technology in secondary school management in Machakos County, similar studies should be carried out in other counties for purposes of generalizing these research findings.
- ii Since the focus of this study was the use of IT in secondary school management, similar studies should be conducted focusing on the use of IT in primary schools' management.

## REFERENCES

- Adiele, K. C. (2012). New product development and consumer innovative behavior: an empirical validation study. *European Journal of Business and Social Sciences*, 1(6), 97-109.
- Al Sharija, M., & Watters, J. J. (2012). Innovative leadership by school principals: Embedding information communication and technology in Kuwaiti schools. *Journal of International Education Research (JIER)*, 8(4), 425-434.
- Al-Zaidiyeen, N. J., Mei, L. L., & Fook, F. S. (2010). Teachers' Attitudes and Levels of Technology Use in Classrooms: The Case of Jordan Schools. *International Education Studies*, 3(2), 211-218.
- Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education and Development using IT*, 8(1).
- Çepni, O. (2013). The use of geographic information systems (GIS) in geography teaching. *World Applied Sciences Journal*, 25(12), 1684-1689.
- Chandran, E. (2014). *Research Methods: A Quantitative Approach with Illustrations from Christian Ministries*. Daystar University Press. Nairobi.
- Chen, S. C., Shing-Han, L., & Chien-Yi, L. (2011). Recent related research in technology acceptance model: A literature review. *Australian Journal of Business and Management Research*, 1(9), 124.
- Chepkonga, S. (2015). *an investigation of the relationship of IT training of principals in IT integration in management public secondary schools: A case of Nairobi County, Kenya*. Unpublished M.Ed Thesis. University of Nairobi.
- Chtourou, M. S., & Souiden, N. (2010). Rethinking the TAM model: time to consider fun. *Journal of Consumer Marketing*.

- Clark, V. L. P. (2019). Meaningful integration within mixed methods studies: Identifying why, what, when, and how. *Contemporary Educational Psychology*, 57, 106-111.
- County Director of Education (2018). Parents participation in school activities. Machakos County Education Office.
- Cresswell, J. W., 2012. Educational research: Planning, conducting, and evaluating quantitative and qualitative research. 4th ed. Boston, MA: Pearson.
- Curtis, E. A., Comiskey, C., & Dempsey, O. (2016). Importance and use of correlational research. *Nurse Researcher*, 23(6).
- Den Ouden, E. (2011). *Innovation design: Creating value for people, organizations and society*. Springer Science & Business Media. New York.
- Di Pietro, L., Di Virgilio, F., & Pantano, E. (2012). Social network for the choice of tourist destination: Attitude and behavioural intention. *Journal of Hospitality and Business Research*, 12 (12), 1563-1574.
- Delgado, A. J., Wardlow, L., McKnight, K., & O'Malley, K. (2015). Educational technology: A review of the integration, resources, and effectiveness of technology in K-12 classrooms. *Journal of Information Technology Education*, 14.
- Djamasbi, S., Strong, D. M., & Dishaw, M. (2010). Affect and acceptance: Examining the effects of positive mood on the technology acceptance model. *Decision Support Systems*, 48(2), 383-394.
- Empirica. (2006). Use of computers and internet in schools in Europe: Country brief, European Commission Information Society and Directorate General. Lisbon, Germany.
- Ghavifekr, S., Afshari, M., Siraj, S., & Seger, K. (2013). IT application for administration and management: A conceptual review. *Procedia-Social and Behavioral Sciences*, 103, 1344-1351.
- Gigler, B. S. (2011). teachers' use of IT based management strategies in Singapore. Available at SSRN 2191594.
- Gorder, L. M. (2008). A study of teacher

- perceptions of instructional technology integration in the classroom. *Delta Pi Epsilon Journal*, 50(2), 63-76.
- Githagu, V. (2017). Influence of management process on implementation of government sponsored projects in Kirinyaga county: a case of public secondary schools' projects in Kirinyaga county (Doctoral dissertation, University of Nairobi).
- González-Sanmamed, M., Sangrà, A., & Muñoz-Carril, P. C. (2017). We can, we know how. But do we want to? Teaching attitudes towards ICT based on the level of technology integration in schools. *Technology, Pedagogy and Education*, 26(5), 633-647.
- Hennessy, S., Onguko, B., Harrison, D., Ang'ondi, E. K., Namalefe, S., Naseem, A., & Wamakote, L. (2010). Developing the use of information and communication technology to enhance teaching and learning in East African schools: Review of literature. *Centre for Commonwealth Education & Aga Khan University Institute for Educational Development–Eastern Africa Research Report*.
- Hew, K. F., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational Technology Research and Development*, 55(3), 223-252.
- Ibrahim, A. (2016). *Factors affecting the embracing of IT in secondary schools in Westlands, Kenya* (Doctoral dissertation, University of Nairobi).
- Keengwe, J., & Onchwari, G. (2008). Computer technology integration and student learning: Barriers and promise, *Journal of Science Education and Technology*, 2(17) 560–565.
- Kenneth, W., Rebecca, N., & Eunice, M. A. (2012). Factors Affecting Adoption of Electronic Commerce among Small Medium Enterprises in Kenya: Survey of Tour and Travel Firms in Nairobi. *International Journal of Business, Humanities and Technology*, 2 (1).

- Kombo, D. K., & Tromp, D. L. (2011). Proposal and thesis writing. *An Introduction. Nairobi. Pauline's publication Africa.*
- Kothari, C. R. (2014). (eds.) *Research Methodology: Methods and Techniques.* New Age International. New Delhi.
- Kozma, R. B. (2005). National policies that connect IT-based education reform to economic and social development. *Human Technology: An Interdisciplinary Journal on Humans in IT Environments*,3(2)29-34
- Lai, P. C. (2017). The literature review of technology adoption models and theories for the novelty technology. *JISTEM-Journal of Information Systems and Technology Management*, 14(1), 21-38.
- Lee, S. G., Trimi, S., & Kim, C. (2013). The impact of cultural differences on technology adoption. *Journal of World Business*, 48(1), 20-29.
- Lekhanya, L. M. (2013). Cultural influence on the diffusion and adoption of social networks. *International Business & Economics Research Journal*, 2 (1), 15-17.
- Lo, H.Y. (2014). Quick response codes around us: personality traits, attitudes toward innovation and acceptance. *Journal of Electronic Commerce Research*, 12 (12), 1563-1574.
- MacVaugh, J., & Schiavone, F. (2010). Limits to the diffusion of innovation: A literature Review. Media Technologies by Entrepreneurs in Rural South Africa. *International Business & Economics Research Journal*, 12 (12), 1563- 1574.
- Makewa, L., Meremo, J., Role, E., & Role, J. (2013). IT in secondary school administration in rural Southern Kenya: An educator's eye on its importance and use. *International Journal of Education and Development Using IT*, 9(2).
- Maki, C. (2008). "Information and communication technology for administration and management for secondary schools in Cyprus". *Journal of Online Learning and Teaching*, 4(3), 18-20.

- Manu, M. A. (2012). *Disruptive Business: Desire, innovation and the re-design of business*. Gower Publishing, Ltd.
- Mathipa, E. R., & Mukhari, S. (2014). Teacher factors influencing the use of IT in teaching and learning in South African private urban schools. *Mediterranean Journal of Social Sciences*, 5(23), 1213-1213.
- May, T. (2011). *Social Research: Issues, Methods and Research*. McGraw-Hill International.
- Mazman, S. G., Usluel, Y. K., & Çevik, V. (2009). Social Influence in the adoption Process and Usage of Innovation: Gender Differences. *International Journal of Behavioral, Cognitive, Educational and Psychological Sciences*, 1 (4), 229-232.
- Mingaine, L. (2013). Skill challenges in adoption and use of IT in public secondary schools, Kenya. *International Journal of Humanities and Social Science*, 3(13), 61-72.
- Mobegi, F. O., Ondigi, A. B., & Oburu, P. (2010). Secondary school headteachers' quality assurance strategies and challenges in Gucha district, Kenya. *Educational Research and Reviews*, 5(7), 408-414.
- Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative and Qualitative. Approaches*. Nairobi; African Centre for Technology Studies.
- Mwunda, N. M. (2014). A framework for integration of IT in teaching and learning process in Machakos Sub county. *Unpublished Masters Project*. Moi University.
- Neyland, E. (2011). Integrating online learning in NSW secondary schools: Three schools' perspectives on IT adoption. *Australasian Journal of Educational Technology*, 27(1).
- Njoroge, S. (2018). *Use of IT in the management of schools in Thika District of Kiambu County*. Unpublished Masters of Education Thesis. University of Nairobi.

- Ogachi, M. (2014). *Factors influencing principals' integration of IT in administration of public secondary schools in Isinya sub-county, Kenya*. Master's Thesis, unpublished: University of Nairobi.
- Ogundile & Okagbue (2014). Determinants of IT adoption for schools' performance in Anambra State, Nigeria. *American International Journal of Contemporary Research*, 4(7), 163-176.
- Olise, M. C., Anigbogu, T. U., Edoko, T. D., & Okoli, M. I. (2014). Determinants of IT adoption for improved SME's performance in Anambra State, Nigeria. *American International Journal of Contemporary Research*, 4(7), 163-176.
- Omariba, A., Ondigi, S. R., & Ayot, H. O. (2016). Challenges Facing Teachers in Integrating Educational Technology into Kiswahili Teaching. A Case of Selected Secondary Schools in Kisii County, Kenya.
- Peralta, H., & Costa, F. (2017). Teachers' competence and confidence regarding the use review and integrative model. *European Journal of Innovation Management*, 13(21)115-126
- Saleem, H., Beaudry, A., & Croteau, A. M. (2011). Antecedents of computer self-efficacy: A study of the role of personality traits and gender. *Computers in Human Behavior*, 27(5), 1922-1936.
- Saunders, M., Lewis, P. & Thornhill, A. (2012) "Research Methods for Business Students" 6<sup>th</sup> edition, Pearson Education Limited
- Tomei, L. A. (2005). Taxonomy for the technology domain. In *Taxonomy for the Technology Domain* (pp. 89-108). IGI Global. *Tourism Technology*, 3 (1).
- Trivedi, T. (2011). Assessing secondary school teachers' attitude towards teaching profession. *Journal of All India Association for Educational Research*, 23(1&2).
- Tweed, S. R. (2013). Technology implementation: Teacher age, experience, self-efficacy, and professional development as related to classroom technology integration.

- Vanderlinde, R., Dexter, S., & van Braak, J. (2012). School-based IT policy plans in primary education: Elements, typologies and underlying processes. *British Journal of Educational Technology*, 43(3), 505-519.
- Wanjala, M. M. S., Khaemba, E. N. & Mukwa, C. (2011). Significant Factors in Professional Staff Development for the Implementation of IT Education in Secondary Schools: A case of schools in Bungoma District, Kenya. *International Journal of Curriculum and Instruction*, 1(1), 30-42.
- Weber, L. (2012). *Factors that influence the adoption of IT in basic education management*. Unpublished M.Ed. Thesis, Brockport State. University of New York.
- Wood, S. L. (2010). Technology for teaching and learning: Moodle as a tool for higher education. *International Journal of Teaching and Learning in Higher Education*, 22(3) 299-307.

## APPENDICE

### Appendix A: Questionnaire for Teachers

This questionnaire is designed to gather information on whether the principal's characteristics influences the use of information technology in public secondary school management in Machakos County, Kenya. This tool is meant to collect data on this subject. Kindly answer all questions. The information you provide is only meant for use in this study only therefore do not indicate your name or that of your school. Kindly tick as appropriate.

#### SECTION A: Demographic Information

1. Indicate your age bracket in years?  
Under 23            [   ]  
24-28                [   ]  
29-33                [   ]  
Over 33 years        [   ]
  
2. What is your gender?  
Male                 [   ]  
Female                [   ]
  
3. How long have you worked in this school?  
Below 5 years        [   ]  
5-15 years            [   ]  
16-25 years          [   ]  
Over 25 years        [   ]
  
4. Indicate using a tick, the school category.  
National             [   ]  
Extra County        [   ]  
County                [   ]  
Sub-county          [   ]

### SECTION B: Principal's personality and the use of IT

5. The statements in this section concern the influence of the principal's personality and the use of IT in school management. Using the key below, please indicate the extent to which you agree with each of the statements. 1= Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5= Strongly Agree

Statement	1	2	3	4	
The principal is always open to new ideas especially those related to technology					
The principal is achievement oriented and always wants to complete whichever project he starts					
The principal prefers uniqueness and is always trying out new ideas in IT that can make work easier					
The principal does not allow others access to IT equipment in the school					
The principal allows all members of staff to access the IT equipment in the school					

### SECTION C: Principal's attitude and the use of IT in records management

6. The statements in this section concern the influence of the principal's attitude and the use of IT in school management. Using the key below, please indicate the extent to which you agree with each of the statements. 1= Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5= Strongly Agree

Statement	1	2	3	4	5
The principal believes in adopting technology to ease the performance of administrative tasks					
The principal is very helpful and supportive in introducing new technology in the school					
The principal keeps on emphasizing the need for adopting technology adoption to make work easier					
The principal encourages teachers to enrol for IT classes to improve their skills					
The principal does not seem to be keen on adopting IT in school management					

**SECTION D: Principal's IT skills and the use of IT**

7. The statements in this section concern the influence of the principal's IT skills and the use of IT in school management. Using the key below, please indicate the extent to which you agree with each of the statements. 1= Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5= Strongly Agree

<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
The principal has the requisite skills in use of computer and internet					
The principal has taken the lead role in ensuring training in e-mails and internet use and its integration in the school					
The principal does candidates' online registration on his own					
The school is well equipped with IT facilities which helps the principal and the teachers to conduct exams analysis using IT					
The principal uses other web-based services to communicate with parents and other stakeholders					

**SECTION E: Principal's social networks and the use of IT**

8. The statements in this section concern the influence of the principal's social networks and the use of IT in school management. Using the key below, please indicate the extent to which you agree with each of the statements. 1= Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5= Strongly Agree

<b>Statement</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Regular bench-marking with reference groups (schools using IT) around our school has influenced the school's extent of IT use					
The school's adoption of IT has made the school community feel part of a larger community of schools using IT					
IT integration in the school has improved communication and relations in the community					
The friendly schools around the County seem to have a great influence on the rate of IT adoption in the school					
The cultural values and norms around the community where the school is found seems to favour the adoption of IT					

**SECTION F: Use of IT in school management**

9. For how many years have you been using IT in the school?

0 years                    [ ]    1-5 years                    [ ]

6-10 years                [ ]    above 10 years             [ ]

10. Tick [Y] the areas in which IT is used in your school?

Students records                    [ ]

Financial management                [ ]

Personnel management                [ ]

Curriculum management                [ ]

## Appendix B: Interview Guide for Principals

This guide is designed to gather information about the influence of principal's characteristics on the use of information technology in public secondary school management in Machakos County, Kenya. The information you provide is only meant for use in this study only therefore do not indicate your name or that of your school. Please answer as correctly and as honestly as possible. Kindly respond to all questions.

Objective	Research Questions	Probing Questions
To establish the influence of principals' personality on the use of information technology in public secondary schools management in Machakos County.	How does the principals' personality influence the use of information technology in public secondary schools management in Machakos County?	<ul style="list-style-type: none"> <li>• For how long have you been the head of this school?</li> <li>• For how long has IT been in use in this school?</li> <li>• Would you say that your personality played a role in the decision to adopt IT in school management? Please explain.</li> </ul>
To establish how the principal's attitude towards IT influences the use of information technology in public secondary schools management in Machakos County.	How does the principals' attitude influence the use of information technology in public secondary schools management in Machakos County?	<ul style="list-style-type: none"> <li>• What would you say is your attitude towards technology? Kindly elaborate.</li> <li>• In your opinion, has your attitude towards IT influenced your decision to use technology in school management? Please explain.</li> <li>• Do you think that use of IT has helped solve some of the challenges you encounter in the</li> </ul>

Objective	Research Questions	Probing Questions
		course of your work? Please explain
To explore how the principals' IT skills influence the use of information technology in public secondary schools management in Machakos County.	What is the influence of the principals' IT skills on the use of information technology in public secondary schools' management in Machakos County?	<ul style="list-style-type: none"> <li>• How would you rate your IT skills? Please explain</li> <li>• What is your experience with using IT in school management? Kindly give details</li> <li>• How did your IT skills inform your decision to use technology in school management?</li> </ul>
To establish the influence of the principals' social networks on the use of information technology in public secondary schools' management in Machakos County.	How does the principal's social networks influence the use of information technology in public secondary schools' management in Machakos County?	<ul style="list-style-type: none"> <li>• Would you say that your social networks (including friends and principals from other schools) have influenced the extent to which IT is adopted in school management in your school? (kindly elaborate)</li> <li>• Please explain how IT is used in the following areas in your school <ul style="list-style-type: none"> <li>○ School plant management</li> <li>○ Personnel management</li> <li>○ Curriculum management</li> </ul> </li> </ul>

## Appendix C: Research Authorization



### KENYATTA UNIVERSITY GRADUATE SCHOOL

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Our Ref: E55/CE/28319/2018

DATE: 21<sup>st</sup> December, 2021

Director General,  
National Commission for Science, Technology  
and Innovation  
P.O. Box 30623-00100  
**NAIROBI**

Dear Sir/Madam,

SUBJECT: RESEARCH AUTHORIZATION FOR FAITH MWANTHI- REG. NO. E55/CE/28319/2018

I write to introduce Ms Faith Mwanthi who is a Postgraduate Student of this University. She is registered for M.Ed degree programme in the Department of Educational Management Policy and Curriculum Studies.

Ms. Mwanthi intends to conduct research for a M.Ed Project Proposal entitled, "Influence of Principals' Characteristics and the Use of Information Technology in School Management in Public Secondary Schools in Machakos County, Kenya".

Any assistance given will be highly appreciated.

Yours faithfully,

  
PROF. ELISHIBA KIMANI  
DEAN, GRADUATE SCHOOL.

FK/eng

## Appendix D: Research Permit

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 548967	Date of Issue: 24/January/2022
<b>RESEARCH LICENSE</b>	
	
<b>This is to Certify that Ms. Faith Nduge Mwanthi of Kenyatta University, has been licensed to conduct research in Machakos on the topic: INFLUENCE OF PRINCIPALS' CHARACTERISTICS AND THE USE OF INFORMATION TECHNOLOGY IN SCHOOL MANAGEMENT IN PUBLIC SECONDARY SCHOOLS IN MACHAKOS COUNTY, KENYA for the period ending : 24/January/2023.</b>	
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548967 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
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## Appendix E: Machakos County Map

