

**FACTORS INFLUENCING TEACHER PARTICIPATION IN INTEGRATION
OF ICT IN TEACHING AND LEARNING IN PUBLIC SECONDARY SCHOOLS
IN GATUNDU SOUTH SUB-COUNTY.**

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DECLARATION

This research project is my original work and has not been submitted for the award of a degree or any other award in any other university.

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L40/6286/2017

This research has been presented for examinations with my approval as the university supervisor

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DEDICATION

This work is dedicated to my beloved wife; Beatrice Wangui and our son Dawn.

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TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	x
ABBREVIATIONS AND ACROYNMS	xi
ABSTRACT	xii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background to the Study.....	1
1.2 Statement of the Problem.....	5
1.3 Purpose of the Study	6
1.4 Objectives	6
1.5 Research Questions	6
1.6 Significance of the Study	7
1.7 Delimitations of the Study	8
1.9 Assumptions of the Study	8
CHAPTER TWO	9
LITERATURE REVIEW	9
2.1 Introduction.....	9
2.2 Teachers' Lesson Workload and Integration of ICT in Teaching and Learning	9
2.3 Availability of ICT Infrastructure in Schools and ICT Integration in Teaching and Learning	10
2.4 Teacher Training and Integration of ICT in Teaching and Learning.....	13
2.6 Summary of Literature Review	17
2.7 Theoretical Framework.....	18
CHAPTER THREE	21
RESEARCH METHODOLOGY	21
3.1 Introduction.....	21

3.2 Research Design.....	21
3.3 Target Population.....	21
3.4 Sampling Procedure and Sample Size	21
3.5 Research Instruments	22
3.6 Validity of Research Instruments.....	23
3.7 Reliability of Research Instruments.....	24
3.8 Data Collection Procedures.....	25
3.9 Data Analysis Procedures	25
3.10 Ethical Considerations	25
CHAPTER FOUR.....	26
DATA ANALYSIS, PRESENTATION AND INTERPRETATION	26
4.1 Introduction.....	26
4.2 Questionnaire Return Rate	26
4.3 Demographic Characteristics of the Respondents.	27
4.3.1 Distribution of Respondents by Age.....	27
4.3.2. Distribution of Respondents by Gender.....	28
4.3.3 Academic Qualification of the Respondents.....	29
4.3.4. Working Experience of Teachers and Principals.....	30
4.4 Teachers Training on ICT.....	32
4.4.1 Level of ICT Training of the Teachers	33
4.5 Teaching Workload of the Teachers	34
4.5.1 Teachers View on the Influence of Workload on ICT Integration in Teaching and Learning	35
4.6 Influence of ICT Infrastructure on Integration of ICT in Teaching and Learning	35
4.6.1 Convenient Access to Computers at School	36
4.6.2 Reliability of Internet Connections in the School.....	36
4.6.3 Main ICT Infrastructure Challenge Faced at School.....	37
4.6.4 How ICT Infrastructure can be Improved.....	38
4.7 Influence of School Management on the Integration of ICT in Teaching and Learning.	39
4.7.1: School Management Importance in ICT Integration in Teaching and Learning.....	39

4.7.2: Teachers’ Ratings on Level of School Management Support in Integration of ICT at the School	40
4.7.3: Availability of a Clear Policy on ICT Integration in Teaching and Learning in School.....	41
CHAPTER FIVE	43
SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS	43
5.1 Introduction.....	43
5.2 Summary of Findings of the Study	43
5.2.1 Questionnaire Return Rate.....	43
5.2.2 Teachers and Principals Demographics in ICT Integration	43
5.2.3 How Training of Teachers and Principals Influence Integration of ICT in Teaching and Learning.....	44
5.2.4 Extent to Which Lesson Workload Influence Integration of ICT in Teaching and Learning.	44
5.2.5 To Determine How the Availability of ICT Infrastructure Influence Integration of ICT in Teaching and Learning.	45
5.2.6 Influence of School Administration in ICT integration in teaching and learning	45
5.3 Conclusion	46
5.4 Recommendations.....	47
REFERENCES.....	50
APPENDICES-APPENDIX I	53
QUESTIONNAIRE FOR TEACHERS	53
QUESTIONNAIRES FOR SCHOOL PRINCIPALS	57

LIST OF TABLES

Table 3. 1: Sample Size	22
Table 4. 1: Questionnaire Return Rate for Principals and Teachers	26
Table 4. 2: Age Bracket of Teachers	27
Table 4. 3: Age Bracket of Principals	28
Table 4. 4: Teachers Distribution by Gender	28
Table 4. 5: Principals Distribution by Gender	29
Table 4. 6: Academic Qualifications of Teachers	29
Table 4. 7: Academic Qualifications of Principals	30
Table 4.8: Teaching Experience of Teachers	30
Table 4. 9: Teaching Experience of Principals	31
Table 4. 10: Teacher Demographics and ICT Integration	31
Table 4. 11: Principals Demographics and ICT Integration	32
Table 4. 12: Teachers Training on ICT	33
Table 4. 13: Levels of ICT Training Among Teachers	33
Table 4. 14: Teachers Teaching Workload	34
Table 4. 15: Principals Teaching Workload	34
Table 4. 16: Teachers' Views on Whether Teachers' Workload Influence ICT Integration	35
Table 4. 17: Teachers Have a Convenient Access to Computers in School	36
Table 4. 18: Teachers Response on Whether There is a Reliable Internet Connection at School	36
Table 4. 19: Principals Response on Whether There is a Reliable Internet Connection at School	37
Table 4. 20: Response for Teachers on the Main ICT Infrastructure Challenge Faced at School	38
Table 4. 21: Teachers View on How ICT Infrastructure can be improved	39
Table 4. 22: Teachers Response as to Whether School Management is Important in ICT Integration in Teaching and Learning.	40
Table 4.23: Teachers' Ratings on School Management Support on ICT Integration	40

Table 4. 24: Teachers Response on Whether There is a Clear Policy on ICT use in Their School.....	41
Table 4.25: Principals Response on Whether There is a Clear Policy on ICT use in Their School.....	42

LIST OF FIGURES

Figure 1: Conceptual framework of the study	19
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ABBREVIATIONS AND ACROYNMS

ASAL	Arid & Semi-arid Land
AVU	African Virtual University
CEPK	Computers in Education Projects in Kenya
GeSci	Global e-School Communities Initiative
ICT	Information Communication Technology
KICD	Kenya Institute of Curriculum Development
KIE	Kenya Institute of Education
SDG	Sustainable Development Goals
MOEST	Ministry of Education science and technology
NEPAD	New Partnership for African Development
ODEL	Open Distance and Electronic Learning
UN	United Nations
UPE	Universal Primary Education
ADSI	Africa digital schools' initiative
NI3C	National ICT Innovation and Integration Centre

ABSTRACT

This research focuses on factors influencing integration of ICT in teaching and Learning in secondary schools in Gatundu South Sub County, Kiambu County, Kenya. Research has not been exhaustive especially on the area of ICT integration in teaching and learning in secondary schools. In particular, not very much research has been conducted in Gatundu South Sub County on levels of ICT integration in teaching and learning in secondary schools. To fill this gap, this study focused on teachers and principals and carried a study into the extent of their integration of ICT in teaching and learning process in Gatundu South Sub County. The study was guided by the following objectives; to determine the extent to which the teacher lesson workload influence integration of ICT in teaching and learning, to explore how ICT infrastructure influence teacher participation in integration of ICT in teaching and learning, to establish the extent to which teacher training influences integration of ICT in teaching and learning and to assess how the school administration influence ICT integration in teaching and learning in Gatundu South, Kiambu. The study adopted a descriptive survey design. The target population for this study was 448 teachers and principals. A sample size of 143 participants comprising of 11 principals and 132 teachers was used for the study. The data for this study was collected using two types of questionnaires one for teachers and the other for principals. Data analysis was performed using descriptive statistics, frequencies and percentages were used to analyze quantitative data. From the study it was established that teacher demographics (age, gender, academic qualifications and experience) are not the only factors that determine the use of ICT. It was established that majority of the teachers had used ICT in one way or the other and were able to apply the same in class. It was also established that many teachers had many lessons to teach in a week thus had inadequate time to prepare for ICT related lessons. There were inadequate computers in most schools and unreliable internet connection as the main infrastructural challenges. It was also established that school management support in integration of ICT in teaching and learning was below average. From the findings, it was concluded that integration will only be successful if all schools are equipped with adequate and modern computers as well as a reliable internet connectivity. Teachers be increased by the Teacher Service Commission to reduce teacher workload and school managers to support the programme in their schools by providing clear policies and required infrastructure. It was recommended that the MOE should ensure that all secondary schools are provided with ICT infrastructure of high quality, ICT training of teachers, employment of more teachers and school partnership with NGO's for provision of facilities.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Information Communication and Technology (ICT) is becoming increasingly important in our daily lives and in our educational systems. ICT provides an array of powerful tools that can help in transforming the present isolated, teacher-centered and text-bound classrooms into technology enriched, student-focused and interactive knowledge environments (Smriti, 2013).

The introduction of ICT and especially the internet has brought immense changes in the world and more so in communication. Educational institutions are under increasing pressure to use the new information and communication technologies (ICTs) to teach students the knowledge and skills they need in the 21st century (Wan, 2011). ICTs have the potential to transform the nature of education. Governments in the world over have invested heavily on the provision of ICTs in public schools. The United Kingdom in the 2008/09 financial year budgeted 2.5 billion pounds while the USA used \$ 6 billion in the same period for the provision of ICTs in education (Nut, 2010). Some case studies done on ICT integration in Finland indicate that knowledge creation, technological innovativeness, organizational networking and knowledge sharing can support both sustained economic growth and social development (Greenberg, 2011).

Singapore and Finland have come up with national plans for ICT integration in their schools which specify the hardware, software, the networking to be implemented, the technical support and the training of teachers (Kozma,2010). The national plans in these countries authorize and fund specific programs and projects by providing the resources

needed for ICT integration in their schools. Efforts to achieve universal primary education (UPE) and the integration of ICT in the school curriculum have been established universally by multinational institutions and in continental structure. At multinational level the global e-school communities' initiative (GeSci) emphasizes on deployment of ICT in schools so as to improve teaching and learning in developing countries (GeSci, 2012).

In Africa, New Partnership for African Development (NEPAD) has established the e-school with the objectives of providing computers to all schools in the African continent (The NEPAD e-African Commission, 2010). Through this initiative NEPAD undertakes to advance ICT skills to primary and secondary school students. NEPAD as well coordinate ICT curriculum and content development in all schools in Africa which will advance teaching and learning across the African continent.

Nigeria recognizes the pivotal roles of ICT in the revitalization and development of the country's education system. Teachers perceive ICT as very useful and using computers makes teaching and learning easier. ICT integration in the Nigerian School system came with the 2001 National Policy on Information Technology tagged "Use IT" which revolutionised ICT use in schools.

Kenya launched a National ICT Innovation and Integration Centre (NI3C) in 2011 at the Nairobi University's Kenya Science campus. The Centre was expected to enable developers demonstrate the application of ICT technologies and new pedagogic aspects of ICT in teaching and learning. The Centre was also expected to provide guidance to education managers on ICT innovations and integration aspects.

The government of Kenya plans to increase human resource capacity in ICT through improved ICT in education in schools and training of teachers and to expand the fiber optic network to cover schools. The government of Kenya five years ago started to progressively roll out free WI-FI in major towns, develop human resource capacity through education to improve the ability to perform tasks effectively in digital environment and to evaluate and apply new knowledge gained from digital environments (Working Draft- Information and Communication Technology Sector Policy guidelines, 2013).

Papayioannou and Charalambous (2014) stress that ICT in school can motivate students, stimulate their interest, increase their self-confidence and self-esteem, increase their creativity, allow greater interactivity, enhance their critical thinking and increase their attainments among other benefits. Laaria (2015) notes that ICT can enhance teacher's efficiency and enthusiasm encourage their planning and cooperation, help them adopt student-centered teaching strategies, reduce their workload, and improve the relationship between teachers and students. With these realization governments in the world have created sustainable development goals (SDGs) with universal education being given priority. Information Communication Technology (ICT) is an enabler and an enhancer of teaching and learning process in the realization of the SDGs. ICT and its continuous innovations have improved work efficiency in modern living.

Educational ICT software helps in simplifying difficult concepts, making learning fun and easy (Simkins, 2012). It also helps learners carry out practical tasks such as experiments and presentations. With all the efficiencies of ICT and its continuous government has seen the need to include technology in teaching as supported by the Kenya National ICT Strategy for Education and Training (MOEST, 2010). Through this strategy, it is noted that

although the impact of ICT on education goals is still inconclusive, reported observations include rapid expansion of knowledge, improved examination outcomes, enhanced communication and technical efficiency. Davies (2011) observes that the success of ICT rests on proactive school teachers who give timely support to the integration of ICT in school operations. The integration of ICT in the curriculum aims at promoting educational change, improve skills of learners and prepare them for the global economy and information society (Haddad, 2011). ICT integration improves access to delivery of education by improving learners understanding and quality of education hence increases impact to the economy which is key to realization of the SDGs (Haddad, 2010). ICT facilities are important and need to be productively integrated into the curriculum if they are to make a positive impact in education (Mlitwa, 2010). Integration of ICT into the curriculum means proper alignment of educational technologies with pedagogy. One of the most relevant barriers to the effective diffusion of ICT concerns the cultural and personal attitudes of teachers towards ICT. As there is a high rate of failure of ICT initiatives for the creation of development opportunities, a solid understanding of the determinants of user acceptance of particular ICT is crucial not only for theory building but also for effective practice.

ICTs are defined as technologies that facilitate communication and the processing and transmission of information by electronic means. Use of ICT in teaching and learning involves the use of computers in teaching and learning. This include the use of internet to research, sharing of information, presentation of lesson content by use of projectors and the integration of the learning and teaching activities with ICT. Integrating. ICT tools in teaching can lead to increased students' learning competencies and increased opportunities

for communication (Tondeur, 2010). Key findings under Impact (www.becta.org.uk) show that the use of ICT tools in teaching and learning has positive effects on behavior, motivation, communication and process skills and enables autonomous student learning.

According to Gatundu South Education Office 2018 the use of ICT in the sub county has not been sufficiently employed. This has been despite GeSci supporting ICT literacy through Africa digital school initiative (ADSI) programme in most of the schools. GeSci has provided schools with computers and ICT training for teachers in the county. This study therefore set to investigate factors that influence teacher participation in ICT integration in teaching and learning in Gatundu south sub county.

1.2 Statement of the Problem

Many third world countries are in the process of conducting surveys, programmes, projects and formulating policies, all aimed at exploiting the ICT potential for social-economic benefits to develop a competitive advantage (Owino, 2013). The Kenyan government has undertaken the initiative of equipping public secondary schools with ICT resources with the aim of improving academic performances and ICT literacy levels among students (SDG Development Report, 2017). The Ministry of Education has also launched a national ICT policy to integrate computer in classroom instruction. Efforts have also been made to introduce computers in secondary school curricula in specific subjects' instruction. The Kenya Institute of Curriculum Development (KICD) has translated the national ICT policy, prepared ICT curriculum and presented it to schools for implementation. Nevertheless, information at Gatundu South Sub County Education Office 2018 show that majority of the public secondary schools are not using ICT in teaching and learning. It is noted that despite more than six schools in Gatundu South being integrated to the Africa Digital

School Initiative (ADSI) the ICT integration in teaching is still not effective. This study thus endeavors to investigate the factors that make some secondary school teachers in Gatundu South Sub County not to use ICT in teaching and learning with an aim to improve ICT integration in the sub county

1.3 Purpose of the Study

The purpose of this study was to investigate factors influencing teacher participation in the integration of ICT in teaching and learning in public secondary schools in Gatundu South Sub County, Kiambu.

1.4 Objectives

- i. To determine the extent to which the teacher lesson workload influence integration of ICT in teaching and learning in Gatundu South, Kiambu.
- ii. To explore how ICT infrastructure influence teacher participation in integration of ICT in teaching and learning in Gatundu South, Kiambu.
- iii. To establish the extent to which teacher training influences integration of ICT in teaching and learning in Gatundu South, Kiambu
- iv. To assess how the school administration influence ICT integration in teaching and learning in Gatundu South, Kiambu.

1.5 Research Questions

- i. To what extent does the teacher lesson workload influence integration of ICT in teaching and learning in Gatundu South, Kiambu?
- ii. How do ICT infrastructure influence teacher participation in integration of ICT in teaching and learning in Gatundu South, Kiambu?

- iii. To what extent does teacher training influence integration of ICT in teaching and learning in Gatundu South, Kiambu?
- iv. How does the school administration influence ICT integration in teaching and learning in Gatundu South, Kiambu?

1.6 Significance of the Study

The findings from the study may be useful to curriculum planners, developers and policy makers by giving information that can contribute to efforts made to improve quality of education. The study would improve insight and understanding of factors influencing the status of ICT integration in secondary schools in the country so that the curriculum developers can address them.

The research findings could also be useful to the Ministry of Education Science and Technology (MOEST) in designing a suitable program for preparing secondary school teachers appropriately for the integration of ICT in teaching and learning. The study findings would help curriculum planners to enhance integration of ICT in teaching and learning in secondary schools in Kenya.

The study may help secondary school head teachers in motivating their teachers and organizing in-service training for them in order to improve their ICT competence hence achieve improved ICT integration in schools. The study may influence secondary school head teachers to equip their schools with ICT facilities. Other researchers may also use the recommendations of this study to carry out further research in similar or related areas. The findings would add knowledge to the field of research.

1.7 Delimitations of the Study

This study was restricted to public secondary school teachers and head teachers in Gatundu South Sub-County only. The factors that were considered in the study were teacher training, lesson workload, ICT infrastructure and influence of school administration in integration of ICT in teaching and learning.

1.8 Limitations of the Study

Time and financial resources were the main limitations of this study. Hence the research was conducted in sampled public secondary schools in Gatundu south Sub-County.

1.9 Assumptions of the Study

- i. The assumptions for this study were that the head teachers and teachers approached would be willing to provide honest and reliable responses.
- ii. The study assumed that all head teachers and teachers would be willing to make use of ICT facilities in teaching.
- iii. The study assumed that the secondary school teachers were qualified and competent to integrate ICT in teaching and learning.
- iv. The study assumed that ICT facilities were available in public secondary schools in Gatundu south for use in teaching and learning.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section discusses factors influencing teachers' participation in the integration of ICT in teaching and learning in public secondary schools in Gatundu south Sub County. It presents the literature review on the extent to which the teacher lesson workload influence integration of ICT in teaching and learning, ICT infrastructure influence on teacher participation in integration of ICT in teaching and learning, to establish the extent to which teacher training influences integration of ICT in teaching and learning and to assess how the school administration influence ICT integration in teaching and learning in Gatundu South, Kiambu. The review also includes a theory upon which the study was based and a conceptual framework showing the interrelationships among the variables.

2.2 Teachers' Lesson Workload and Integration of ICT in Teaching and Learning

Many studies have revealed that the lesson workloads of teachers influence their acceptance of technology in teaching. For example, (Hennessy, 2010) investigated that ICT integration is likely to fail due to lack of time to prepare ICT teaching materials due to loaded curriculum. Teachers feel that infusing ICT in teaching is an added load as it is not part of the curriculum. For ICT to be integrated in the teaching process, it does not necessarily have to be part of the curriculum but rather act as a tool to help in the teaching process. (Harrison, 2010) also noted that converting manual teaching notes to ICT requires both time and skill.

According to (Wamakote, 2010), teachers' lesson workload and time management was a hindrance to the implementation of ICT in teaching. A research carried out in Malaysian

Smart schools in 2010 indicate that many teachers felt time was an important factor in ICT integration. The problem of lack for time exists for teachers in many aspects of their works as it affects their ability to complete tasks. Teachers lack enough time to locate internet advice prepare technological problems and receive adequate training.

According to (Bingimlas, 2010), lack of time affects application of ICT in Saudi Arabia because of busy schedules. He indicated that Saudi teachers, work from 7.00am 2.00pm and the average number of class sessions taught by teachers have a limited number of hours during the day to work on integrating ICT into education. The time factor could be divided into: teachers' free time, time to prepare lesson and time for teaching. Teachers felt that free time is too short to use ICT to integrate it into the lesson, time to prepare for the lesson should be catered for and the teaching time was inadequate if one was to integrate ICT in the lesson. The higher the number of lessons allocated to the teacher per week, the less the number of free lessons resulting into high workload. Understaffing in schools leads to high lesson workload for teachers and as a result they will get less free time for lesson preparation.

2.3 Availability of ICT Infrastructure in Schools and ICT Integration in Teaching and Learning.

To promote the use of ICT as resources and a tool for teaching, initiatives have been put in place globally, continentally and within individual countries which include the Global e-school's initiative. The Global e-School and Communities' Initiative (GeSci) was established in 2003 by the United Nations (UN) ICT task forces (GeSci, 2010). The goal of this initiative is to deploy ICT resources to improve the quality of teaching and learning in primary and secondary education in developing countries (GeSci, 2012). GeSci engages

with Ministries of Education (MOE) and other ministries within a country, to identify limitations and exploit the potential of ICT (ibid). Their objective is to help authorities to make informed decisions with regards to the deployment of educational ICT into schools (ibid). Through the GeSci, ICT facilities are not only deployed to schools but also integrated into school curricula (ibid). Along with global initiatives to ensure integration of ICT into school there are also practices (ICT deployment and integration into school curricula) within continental structures. Across the continent, countries such as South Africa, Senegal, Mali, Ghana, Nigeria, Cameroon, Namibia, Uganda and Kenya, have had ICT in education initiatives that were driven mainly by educational institutions (such as primary and secondary schools) (Farrell, 2011). Within these countries the use of ICT in schools has been made possible by large organizational programs such as the World Bank's Links for Development and School Net Africa. ICT is seen as a tool for achieving educational outcomes (LaRocque 2011). With the advances that ICT has to offer for the teaching and learning process, it is vital that every learner has access to ICT resources, in order to experience its full benefits. To this effect, most African countries (e.g. Ghana, Botswana, South Africa, Zambia, Kenya and Namibia) that have developed national ICT in education policies which emphasis on universal access and use of ICT in all schools. Furthermore, formal structures on the continent, such as New Partnership for Africa's Development (NEPAD) have developed programs such as e-Schools Initiative to promote universal access and use of ICT in all schools (NEPAD, 2010).

East African Countries suffer the inadequacy of technological infrastructure. Such infrastructure includes; hardware, software, limited internet access, poor bandwidth and sporadic electricity. Limited teacher' participation in curriculum development and

evaluation, lack of preservice and in-service training, teacher' brain drain to the western countries, poor teachers' welfare and morale pose challenge to ICT application in schools. Parent and community participation in schools, poor school vision, mission and leadership hinder ICT integration in schools (Onguko, 2010).

According to Gachinu (2014) integration of ICT in teaching Mathematics is limited by insufficient ICT facilities in schools and better performance in achievement tests was realized in school where integration is done in Kenyan schools. Kenya like other developing countries struggles with high levels of poverty and this has an effect on the adoption and access to ICT (OECD, 2004). The initial aim to introduce ICTs in education was primarily at developing ICT skills, the focus has over time shifted to leverage ICTs to address issues of quality and to improve teaching and learning especially at secondary and post-secondary levels. However, availability and use of ICTs at various levels is still patchy. About 1,300 secondary schools out of more than 6,000 schools have computers, while most schools with computers use less than 40% of the available infrastructure and very few actually use ICT as an alternative method for curriculum delivery. This shows a very slow integration pace and may lead to all benefits of ICT in schools un-equitably realized or not being realized in the near future. Many teachers perceive that adoption of ICT in school will render them jobless due to it foreseen benefits such as e-learning and efficiency in the mode of delivery (Kenya ICT policy, 2010). It is with this view that this study sets out to investigate the how the availability of ICT facilities influences the integration of ICT in teaching and learning in public secondary schools Gatundu south sub County.

2.4 Teacher Training and Integration of ICT in Teaching and Learning

Teachers' ICT skills and access to professional development is critical to integration of ICT in school. Research shows that when teachers view ICT programs as either satisfying their own needs or their students' needs, it is likely they will integrate it in subjects (Hennessy, 2010). A needs assessment is important to find out what ICT skills and knowledge teachers need at schools. Designers of teacher education programs should know the pre-service teachers' perceptions of ICT and their attitudes towards ICT integration into curriculum.

New ICT tools and teaching approaches call for the training of teachers (Hennessy, 2010). When teachers are insufficiently trained they will not be confident enough to carry out full integration of ICT in the classroom. With proper training on how to implement ICT, teachers can offer crucial advice on how to select, integrate and evaluate computer tools to support teaching and learning as they are the backbone in any curriculum innovation (Clark, 2011).

The success of integrating ICTs into teaching and learning in developed and developing countries like Kenya depends on how teachers have been prepared to use computers. Since teachers are the backbone in curriculum implementation and integrating computers in schools, they should be trained properly in the use and integration of computers in teaching and learning. When properly trained, teachers' ability to select, integrate and evaluate computer tools to support teaching and learning will improve. However, training of teachers on adoption and use of ICT in most of the developing countries has not been appropriate due to some of the challenges faced (Makhanu, 2010).

For instance, the curricula used for training in most cases are oriented towards teaching technical aspects of technology ignoring organizational and social aspects of ICT. Training of teachers should therefore, focus on the ICT pedagogical issues of ICT utilization in the classroom situation and not just on ICT skills. Pre- service teacher education can provide teachers with adequate opportunities to experiment with ICT before using it to teach students.

According to Becta (2012), lack of ICT concentration in initial training is a barrier to teachers' use of ICT in integrating it in the subject matter. Therefore, where there is no effective training on ICT, teachers will not be able to use ICT resources for integration purposes. (Shivashi, 2010) states that many teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of students who perhaps know more than they do. Effective integration will depend to a larger extent on trained and supported teachers. The greatest challenge of the schools therefore has been the provision of adequate support to teachers in as far as acquisition of appropriate technical skills important for integrating computers in the classroom instruction is concerned.

2.5 School Administration and ICT Integration in Teaching and Learning

Many studies have shown that school leadership plays an increasingly important role in leading change, providing vision and objectives, as well as professional development initiatives in using ICT to bring about pedagogical change (Schiller, 2012). While technology infrastructure is important ICT leadership is even more necessary for effective ICT implementation. While effective leadership is one of the key variables that determine

the success of an educational institution, strategic leadership is needed for long term sustainability of school improvements (Davis, 2013).

According to Brannigan (2010) leadership is one of the several critical components in the successful integration of ICT's in education. The locus of leadership influences the degree to which ICT integration can become embedded in educational institutions as well as the role of leadership in championing ICT. The failure by educational institutions to integrate in education and imprint it on the minds of the teachers has been attributed to lack of leadership capacity (Moyle, 2012). As a result, today's school principals must not only manage the day to day routine activities in the school but also focus on how students learn, performance standards, evidence based decision making and continuous improvement efforts. Ability to plan, implement and sustain changes, including ICT in a school, therefore, depends on the leadership qualities of the school manager.

In line with these idea Fullan,(2013),stated that administrators should understand the element and characteristics of long- range planning for the use of current emerging technology; use technology to communicate efficiently with staff, parents and community, understand how current and available technologies can be integrated effectively into all aspects of teaching and learning process; understand the legal and ethical issues related to technology licensing and usage; and use technology appropriately in leading and communicating about school programs and activities.

As transformational leaders, school managers should show that they also live the values they advocate. This consistency between words and deeds is believed by transformational leaders to build their credibility (Starcher, 2011). The principal as a learning leader,

specifically, can impact multiple areas of the school setting such as ICT integration (Elmore, 2010). (Nataraj, 2011) findings suggested that effective and supportive leaders were most likely to both increase and deepen ICT implementation in a school. Principals are therefore, likely to make the dream of ICT integration in teaching and learning possible leading through modeling and taking an active role towards this effort.

A study conducted by Keiyoro, (2010) shows that only 9.5% of teachers from NEPAD and cyber e-schools in Kenya indicated that the school principals were supportive of ICT integration and the support was linked to principals' belief in the usefulness of ICT. Forty percent (40%) indicated that the level of support ranged between 50% -70%. Forty-Seven percent (47%) indicated that the support was lukewarm while 2.4% felt that there was no support. Teachers felt that the integration of ICT in teaching and learning was still slow among the principals themselves evident in their failure to use internet. Other reasons given include administrative ignorance of the role of ICT in teaching and learning, lack of resources and principals' negative attitude towards ICT usage in teaching and learning science curriculum. A study conducted by Manduku, (2012) concluded that the experiences and perceptions of school leaders and teachers played an important role in the implementation and integration of ICT in Kenyan schools. This indicted that there was need to provide effective and efficient pre-service and in service courses that could enable teachers and administrators successfully use computers in the course of teaching. A further study by Kipsoi, (2012) suggested that the government should revise national plans to implement ICT as they also review both programs for teacher preparation and staff development. His study recommended incorporation of ICT curriculum and managerial skills to training of head teachers. This study therefore sought to establish to what extent

the school managers influence the integration of ICT in teaching and learning in public secondary schools in Gatundu south Sub-County.

2.6 Summary of Literature Review

In conclusion the integration of ICT in education promotes social and economic development. In developed countries ICT has made dramatic role in enhancing social and economic development as well as improving the quality of education. In developing countries, government initiatives have been made to integrate ICT in education but have not yet impacted positively on the quality of education. KICD (2011) observed that some schools in Kenya do not use ICT in teaching and learning. Teacher' competencies, attitudes and reactions have not been taken into considerations towards the governments' efforts to integration of ICT in teaching and learning.

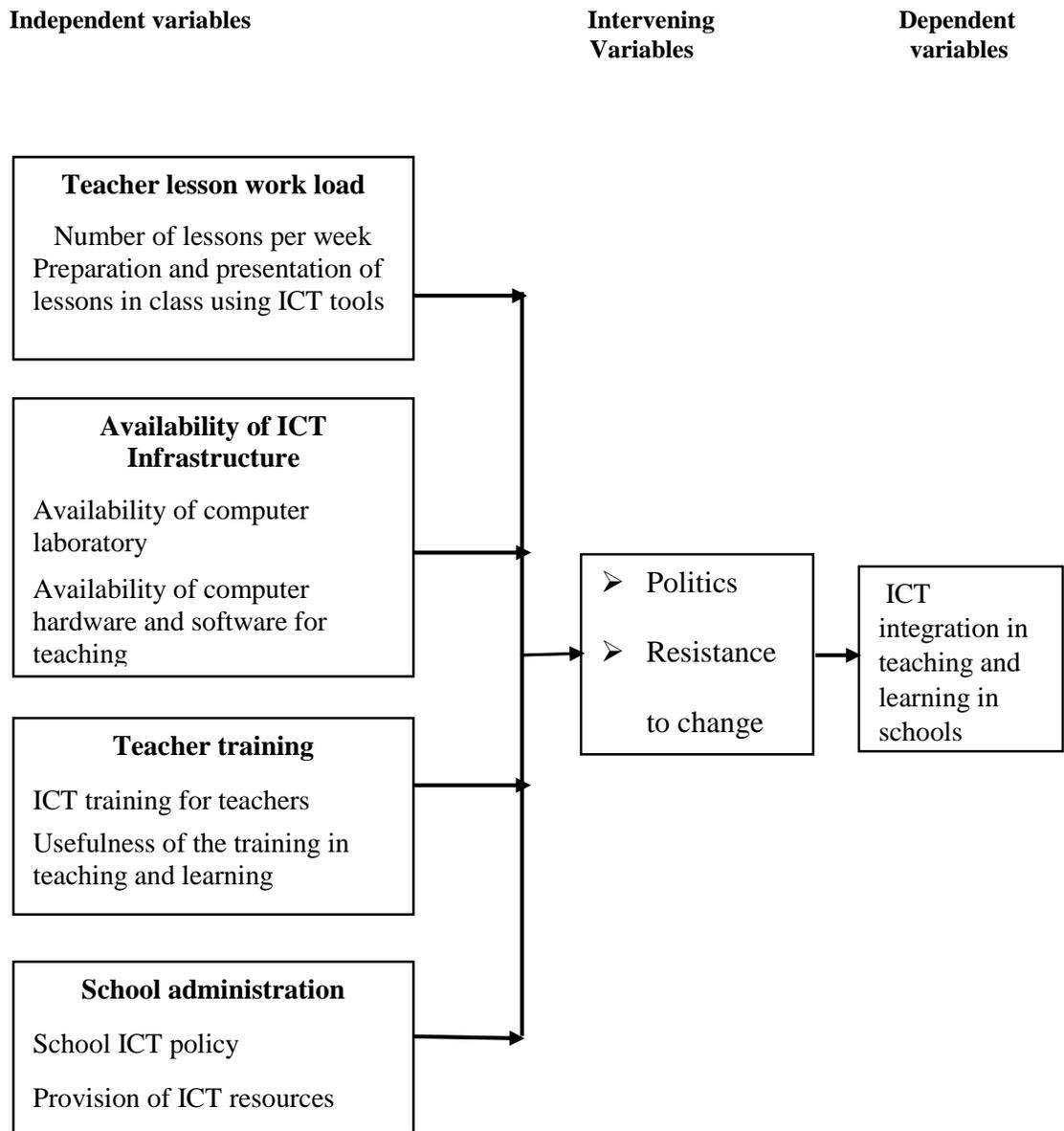
(Pelgram, 2010) noted that ICT was not well integrated in teaching and teachers were still using the traditional classroom practices of lecturing. The application of ICT in teaching and learning in most schools is limited because teacher training institutions mainly emphasize on teaching of technology rather than how to use it to teach. The availability of ICT facilities in most schools is a major challenge despite the governments, public and parents' efforts, therefore, the study focused on investigating the factors influencing teacher participation in the integration of ICT in teaching and learning in Gatundu south Sub County.

2.7 Theoretical Framework

The study was guided by the Education Production Function theory. Coleman, (1966) proposed the theory of education production function as an application of the economic concept of a production function to the field of education. It relates various inputs affecting a student's learning such as schools, families, peers and neighborhoods to measured outputs including subsequent labor market success, college attendance, graduation rates, and, most frequently, standardized test scores. The theory of education production function was used in this study to show how the various inputs in education by the government influence teachers' participation in the integration of ICT in public secondary schools in Gatundu south Sub County. Teachers' training in ICT, availability of infrastructure and the support from the school administration were considered to be the inputs in ICT integration in schools. The provision of such inputs in public secondary schools would result to improved ICT integration in teaching and learning. Robinson in his work assumed that all workers are alike and their work output is the same.

According to this argument, it is impossible to conceive of capital in such a way that its quantity is independent of the rates of interest and wages. Education production function theory therefore was used in this study to establish how teacher training, availability of infrastructure, teachers' workload and the support from the school administration influence integration of ICT in teaching and learning.

Figure 1: Conceptual Framework of the Study



In this study the conceptual framework shows the relationship between independent variables that may influence the dependent variable. The participation of teachers in the integration of ICT in teaching and learning in public secondary schools is influenced by various independent and intervening variables. The independent variables for the study include; Teacher lesson workload i.e. number of lessons per week and preparation and

presentation of lessons using ICT, availability of infrastructure in schools i.e. availability of computer laboratory and computers, teacher training in the use of computers in teaching i.e. level of ICT training and school administration support to integration of ICT in teaching and learning. The intervening variables for this study include; Politics and resistance to change.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This section describes the research design, target population of the study, sampling procedure and sample size, research instruments, and an explanation of data collection procedures as well as data analysis methods to be used in the study.

3.2 Research Design

Research design is the arrangement of conditions for collection and analysis of data. It is a conceptual structure within which research is conducted (Orodho, 2011). This study adopted a descriptive survey design to investigate the factors that influence the integration of ICT in teaching and learning in public secondary schools in Gatundu South Sub County.

3.3 Target Population

Target population constitutes all the items or people under consideration in any field of inquiry (Orodho, 2010). Statistics from Gatundu South Sub-County Education's Office indicate that there are 38 Secondary schools out of which 5 are extra county schools, 10 are Sub County boarding secondary schools and the rest (23) are Sub County mixed day schools. The teachers' population in these schools is 440 and 38 principals from each school.

3.4 Sampling Procedure and Sample Size

Kombo (2011) define a sample as a finite part of statistical population whose properties are studied to gain information about a whole population. Cohen (1994) established that 30% is a true representative of a population under study as the individuals participating in the study possess most of the characteristics present in the group under study. Using

stratified sampling technique, the respondents will be divided into 2 strata; Principals and teachers. In line with Cohen (1994) advice of 30% this study will use a sample of 132 from the 440 teachers and 11 out of the 38 principals from Gatundu South Sub-County as shown in Table 3.1. The eleven principals will be sampled randomly and from each of their schools 12 teachers will participate in this study. So the total number of respondent will be 143 in total.

Table 3. 1: Sample Size

Category	Total number	Sampled number at 30%
Principals	38	11
Teachers	440	132
Total	478	143

Since it was not possible to study all the teachers in secondary schools due to time and financial constraints, the study sample size comprised of one hundred and thirty-two (132) teachers. The researcher sampled 30% of each category of schools i.e. two (2) Extra county three (3) sub County Boarding and six (6) Sub County mixed day schools.

3.5 Research Instruments

The data for this study was collected using questionnaires. Questionnaires allowed the researcher to collect information from a large sample and diverse regions. Questionnaires can be administered to many respondents within a short time and confidentiality upheld since respondents do not indicate their names (Kombo, 2010). This study used two sets of questionnaires one for the school teachers (Appendix I) and another for secondary school principals (Appendix II) to collect data. Both the questionnaire for head teachers and

teachers were divided into sections A, B, C, D and E. Section A sought demographic information on the head teachers, section B sought information on teacher training in ICT, section C sought information on how teacher workload influence teacher participation in ICT integration, section D sought data on the availability of ICT infrastructure while section E sought information on how the school administration support teachers in the integration of ICT in their schools. The questionnaires had both open-ended and closed questions which were used to collect data. Open ended questions allowed respondents to give an in-depth response to the subject of study. Closed questions restricted the respondents to a 4 point Likert Scale namely; Strongly Agreed (SA), Agreed (A), Strongly Disagreed (SD) and Disagreed (D).

Information gathered using questionnaire enabled the researcher to analyze the data objectively and scientifically. In addition, the questionnaire method of data collection allowed the researcher to collect data from a large number of participants with limited effect on its validity and reliability.

3.6 Validity of Research Instruments.

According to Mugenda (2003) validity is the degree to which results obtained from the analysis of the data actually represents the phenomenon under study. To ensure instrument validity, content validity was tested. Content validity is a measure of the degree to which data collected using a particular instrument represents a specific domain of indicators or content of a particular concept. Content validity was used to assess whether the content of the questionnaire measured what it was supposed to measure. The researcher also sought the supervisor's advice on the validity of the instruments. The supervisors' feedback in form of recommendations to the researcher was incorporated in the final instruments.

3.7 Reliability of Research Instruments.

Mugenda (2009) define reliability as a measure of the degree to which research instruments give consistent results after repeated trials. Reliability measures the stability of research instruments across two or more attempts. In this study reliability of the questionnaire was tested using test re-test method. The researcher piloted the questionnaire by giving some five (5) draft questionnaires to teachers and head teachers who answered the questions. This was done in the selected schools at an interval of two weeks before the actual data collection exercise. The feedback obtained from the two testing periods was correlated and analyzed using the Pearson's correlation coefficient to determine reliability of the instrument. According to Boudah (2011) a coefficient of + (plus) or -(minus) 0.8 or more will show that the instruments are reliable. The resulting coefficient will determine reliability of the instrument. The following formula was used to analyze the Pearson's correlation coefficient i.e.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}}$$

Where:

r = Pearson's correlation coefficient

x = values in first set of data

y = values in second set of data

n = total number of values

(Source; Pearson's Correlation Coefficient @ Tutor Vista.com.htm)

The research instruments were pilot-tested and the reliability coefficient was found to be 0.79 for the head teachers and 0.74 for teachers. A correlation coefficient of above 0.7 was considered appropriate (Mugenda & Mugenda, 2003).

3.8 Data Collection Procedures.

The questionnaires were administered to the selected schools by the researcher. The package to each school contained a cover letter explaining the purpose of the study and the questionnaires. The researcher further assured the head teachers and teachers that the findings were only to be used to accomplish the study and confidentiality would be guaranteed.

3.9 Data Analysis Procedures

Data analysis involved qualitative and quantitative methods. The process of data analysis involved editing, coding, classification and tabulation into meaningful categories using descriptive and inferential statistics. Descriptive data was analyzed based on themes using the principle of inductive reasoning. Calculations on frequency distributions, measures of central tendency i.e. mean and percentages of the analyzed data were presented in tables using SPSS package.

3.10 Ethical Considerations

In conducting the research, the researcher did not require names and other means of identifying participants. This was to ensure anonymity and secure the privacy of the participants. This helped the participants to create trust in the researcher. The researcher also ensured he got informed consent from the respondents' before administering the questionnaires and using information only for the disclosed purpose. Participation in the research for the respondents was also voluntary.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND INTERPRETATION

4.1 Introduction

The purpose of this study was to establish the factors influencing the integration of ICT in teaching and learning in public secondary schools in Gatundu South Sub-County, Kiambu County, Kenya. This chapter presents the findings of the study that includes analysis, interpretation and discussions of the data gathered from the field. This chapter is divided into six areas under which findings are discussed. This includes the questionnaire return rate, demographic information of the respondents, the extent to which teachers competency, teacher workload, ICT infrastructure and school administration support influence the integration of ICT in teaching and learning in public secondary schools

4.2 Questionnaire Return Rate

The study targeted 136 teachers and 11 principals in collecting data with regard to factors influencing the integration of ICT in teaching and learning in secondary schools in Gatundu South Sub-County, Kiambu County, Kenya. The questionnaire return rate was 82 (60.29%) for teachers and 11 (100 %) for principals. This information is summarized in Table 4.1

Table 4. 1: Questionnaire Return Rate for Principals and Teachers

Respondents	Number of questionnaires administered	Questionnaires returned	Return rate%
Principals	11	11	100
Teachers	136	104	76.5

From the study 104 teachers filled in and returned the questionnaires making a response rate of 76.5% and 11 principals making a response rate of 100%. This response rate was considered very successful as the percentages were more than the required 75% which is

considered adequate for generalization of results in research

4.3 Demographic Characteristics of the Respondents.

Demographic information in this chapter included the personal information of the teachers and head teachers. It consists of age, gender and academic qualification of the teachers and head teachers.

4.3.1 Distribution of Respondents by Age

The study was conducted to a cross section of respondents with a range of different ages. The study sought to establish the age of the respondents. Table 4.2 presents the age of teachers.

Table 4. 2: Age Bracket of Teachers

Age in years	Frequency	percentage
Less than 25 years	10	9.6
26-35 years	55	52.8
36-50 years	39	37.5
51-60 years	-	-
Total	104	100

From the analysis on Table 4.2 majority of the teachers were between 26-35 years of age 55(52.8%). This may be interpreted to mean that majority of the teachers are young and more receptive to ICT and may be willing to integrate ICT in teaching and learning.

Table 4. 3: Age Bracket of Principals

Age in years	Frequency	Percentage
Less than 25 years	-	-
26-35 years	1	9.1
36-50 years	8	72.7
51-60 years	2	18.2
Total	11	100

Table 4.3 shows that most of the principals 8(72.7%) are between the age of 36 and 50 years while 2(18.2%) are above 51 years. This indicates that most of the principals are old. At such ages most people are not willing to integrate ICT in teaching and learning. Younger people tend to be more ready to embrace technological changes than old ones.

4.3.2. Distribution of Respondents by Gender

Questionnaires were administered by the researcher to both male and female teachers and principals. Therefore, the study sought to find out the gender of the respondents. This was important in establishing and specifying the exact number of male and female respondents. The data is presented in Table 4.4

Table 4. 4: Teachers Distribution by Gender

Gender	Frequency	Percentage
Male	49	47.1
Female	55	52.9
Total	104	100

According to the findings 49(47.1%) of teachers were male while 55(52.9%) were female. This is an indication that both genders were almost equally represented. This means that there may be no biasness in terms of gender as both were well represented.

Table 4. 5: Principals Distribution by Gender

Gender	Frequency	Percentage
Male	5	45.5
Female	6	54.5
Total	11	100

Principals had 5(45.5%) male respondents and 6(54.5%) female respondents. This is a clear indication that both genders are well represented and the results of the findings have not favored any gender. Therefore, both gender have a role to play in the process of ICT integration in teaching and learning.

4.3.3 Academic Qualification of the Respondents

The study was conducted on respondents with different academic qualifications. This information is summarized in Table 4.6.

Table 4. 6: Academic Qualifications of Teachers

Level	Frequency	Percentage
Diploma	15	14.4
Degree (B.Ed)	71	68.3
BA/BSC with PGDE	-	-
Masters	18	17.3
Total	104	100

According to the findings, Diploma graduates accounted for 15(14.4%), degree in education graduates 71(68.3%), and there were no respondents with BA/BSC with P.G.D.E. Those with Master's Degree accounted for 18(17.3%). This is an indication that all the teachers were qualified to teach in secondary schools as per TSC requirements. Most of these institutions offer basic ICT training which enable their graduates to cope well with the changing technology.

Table 4. 7: Academic Qualifications of Principals

Level	Frequency	Percentage
Diploma	-	-
Degree (B.Ed)	10	90.9
BA/BSC with PGDE	-	-
Masters	1	9.1
Total	11	100

Majority of the principals 10(90.9%) had a Degree in education (B.Ed), non with BA/BSC with P.G.D.E while those with masters accounted for 1(9.1%). From this tables it is clear that all the principals just like the teachers were qualified to teach in secondary schools as per TSC requirements.

4.3.4. Working Experience of Teachers and Principals

School principals and teachers were asked how long they had worked in the schools. The responses are shown on table 4.8 below.

Table 4.8: Teaching Experience of Teachers

Years	Frequency	Percentage
Below 1 year	4	3.8
Between 1-5 years	25	57.7
Between 6-10 years	60	24.1
Above 10 years	15	14.4
Total	104	100

As shown from Table 4.8 majority of the teachers had taught in their current schools for between 6 and 10 years which is 60(57.7%) while 15(14.4%) had worked for more than 10 years in their schools. This implies that majority of the teachers had worked in the school for a long time (at least 5 years) and could be in a position to comment on ICT integration in their schools.

Table 4. 9: Teaching Experience of Principals

Years	Frequency	Percentage
Below 1 year	0	0
Between 1-5 years	0	0
Between 6-10 years	4	36.4
Above 10 years	7	63.6
Total	11	100

Table 4.9 shows that majority 7 (63.6%) of principals had worked in the schools for more than 10 years. 4(36.4%) of the head teachers had worked in the schools for a period of 6 to 10 years. The implication of this finding could mean that majority of the principals have stayed long in their schools to respond to the needs of ICT integration in teaching and learning in their schools. They are also able to point out the challenges that the school is facing in the process of integrating ICT in teaching and learning and offer solutions.

Table 4. 10: Teacher Demographics and ICT Integration

Statement	SA		A		D		SD	
	no.	%	no.	%	no.	%	no	%
Gender as an influence of	5	5.4	10	10.8	70	75.3	8	8.6
ICT integration								
Age and ICT integration	22	23.7	56	60.2	5	5.4	10	10.8
Experience in integration of	1	0.9	5	4.8	50	48.1	48	46.2
ICT								

From the table 4.10 majority of teachers 70 (75.3%) disagreed that gender has influence on the integration of ICT in teaching and learning. A majority of 56 (60.2%) agreed that age had influence in ICT integration. 50(48.1%) disagreed and 48(46.2%) strongly disagreed that work experience had influence in ICT integration in teaching and learning. All the principals just like the teachers agreed that gender has no influence in ICT integration, age

affects ICT integration while work experience had no influence in ICT integration in teaching and learning.

Table 4. 11: Principals Demographics and ICT Integration

Statement	SA		A		D		SD	
	no.	%	no.	%	no.	%	no	%
Gender as an influence of	0	0	1	9.1	7	63.6	3	27.3
ICT integration								
Age and ICT integration	5	45.5	5	45.5	1	9.1	0	0
Experience in integration of	0	0	2	1.9	6	54.5	3	27.3
ICT								

In Table 4.11 similar results as those of teachers were enumerated from the Principals where majority of principals 7 (63.6%) disagreed that gender has influence on the integration of ICT in teaching and learning. 5 (45.5%) agreed that age had influence in ICT integration. 6(54.5%) disagreed and 3(27.3%) strongly disagreed that work experience had influence in ICT integration in teaching and learning. Therefore, from the results gender has no influence in ICT integration. Age affects ICT integration while work experience had no influence in ICT integration in teaching and learning

4.4 Teachers Training on ICT

The researcher sought to establish whether teachers have any training on ICT use as a tool for teaching and Learning. This information is summarized in Table 4.12

Table 4. 12: Teachers Training on ICT

Statement	Frequency	Percentage
Yes	70	67.31
No	34	32.69
Total	104	100

From the table 70 (67.31%) of the respondents indicated as having some training in ICT while 34(32.69%) indicated as having no any training on ICT as a tool for teaching and learning. However, much of this training was mainly on the basics introduction to computers offered in university and colleges which may not be of much use in the integration of ICT in schools.

4.4.1 Level of ICT Training of the Teachers

The researcher also sought to establish the level of ICT training among teachers. This information is summarized in Table 4.13

Table 4. 13: Levels of ICT Training Among Teachers

Level	Teachers	Percentage
Certificate	102	98.1
Diploma	2	0.9
Degree	-	-
Total	104	100

Table 4.13 shows that majority of the teachers 102(98.1%) indicated as having a certificate on ICT (introduction to computer studies), 2(0.9%) indicated as having a diploma. No respondent indicated as having a degree on ICT training. From the table most of the teachers have basic computer training. Therefore, most teachers are in a position to use ICT in teaching and learning if given the opportunity, appropriate training in their subject area and favorable conditions

4.5 Teaching Workload of the Teachers

The researcher also sought to establish the number of lessons (workload) assigned to the respondents every week. This information is summarized in table 4.14.

Table 4. 14: Teachers Teaching Workload

Workload	Frequency	Percentage
Below 15 lessons	0	9.6
Between 15 and 20 lessons	12	11.5
Between 21 and 25 lessons	56	53.9
Between 26 and 30 lessons	36	34.6
Above 30 lessons	-	-
Total	104	100

Majority of the respondents 56(53.85%) indicated as having a workload of between 21-25 lessons while 36(34.6%) indicated as having between 26-30 lessons. None had less than 15 lessons in a week. Those with 15-20 lessons were 12(11.54). From this information, teachers have high workload which could hinder them from integrating ICT in teaching and learning. This is because teachers lack enough time to prepare and present ICT lessons which may require a lot of time.

Table 4. 15: Principals Teaching Workload

Workload	Frequency	Percentage
Below 15 lessons	11	100
Between 15 and 20 lessons	-	-
Between 21 and 25 lessons	-	-
Between 26 and 30 lessons	-	-
Above 30 lessons	-	-
Total	11	100

Majority of the principals 11(100%) indicated that their teaching workload was below 15 lessons. They attributed this to the many administrative responsibilities they have. Principals therefore can be pivotal in issues concerning the administration of ICT in

teaching and learning. They can help in policy formulation and acquisition of computers and required infrastructure.

4.5.1 Teachers View on the Influence of Workload on ICT Integration in Teaching and Learning

The researcher sought to establish the views of the respondents on whether teacher's workload influenced the integration of ICT in teaching and learning. This information is summarized in Table 4.16

Table 4. 16: Teachers' Views on Whether Teachers' Workload Influence ICT Integration

Statement	Frequency	Percentage
Strongly disagree	10	9.6
Disagree	0	0
Agree	71	68.3
Strongly agree	23	22.1
Total	104	100

According to the findings, majority of the respondents 71(68.3%) agreed that a teacher's workload greatly influence the integration of ICT in teaching and learning 23(22.1%) strongly agreed while none disagreed. High teacher workload influences ICT integration negatively since teachers have no time to prepare for ICT lessons.

4.6 Influence of ICT Infrastructure on Integration of ICT in Teaching and Learning

The researcher sought to establish to what extent ICT infrastructure influences the integration of ICT in teaching and learning in secondary schools.

4.6.1 Convenient Access to Computers at School

The researcher sought to establish whether teachers have convenient access to computers at school. This information is summarized in Table 4.17

Table 4. 17: Teachers Have a Convenient Access to Computers in School

Statement	Frequency	Percentage
Strongly disagree	45	43.3
Disagree	47	45.2
Agree	12	11.5
Strongly agree	0	0
Total	104	100

Majority 47(45.2%) of the teachers disagreed having a convenient access to computers while 45(43.3%) strongly disagreed. Only 12(11.5%) of the respondents agreed to having a convenient access to computers. From the information it is evident that majority of the schools lack computers as a major tool in ICT integration in teaching and learning. This greatly affect ICT integration since teachers and learners need to interact with computers as much as possible to build their confidence.

4.6.2 Reliability of Internet Connections in the School

The researcher further sought to establish whether there is a reliable internet connection in the school. This information is summarized in Table 4.18

Table 4. 18: Teachers Response on Whether There is a Reliable Internet Connection at School.

Statement	Frequency	Percentage
Strongly disagree	0	0
Disagree	79	75.9
Agree	25	24.1
Strongly agree	0	0
Total	104	100

Most of the teacher respondents 79(75.9%) indicated as not having a reliable internet connection and 25(24.1%) indicated that they had a reliable internet connection in their schools. From the results majority of the schools have no reliable internet connections. This might be the reason why most schools have failed to integrate ICT in teaching and learning.

Table 4. 19: Principals Response on Whether There is a Reliable Internet Connection at School.

Statement	Frequency	Percentages
Strongly disagree	0	0
Disagree	8	72.7
Agree	3	27.3
Strongly agree	0	0
Total	11	100

In Table 4.19 similar results as those of teachers were enumerated from the Principals where 8(72.7%) indicated as having no reliable internet connection while 3(27.3%) cited that there was a reliable internet connection in their schools. From the results most of the schools lack a reliable internet connection. A reliable internet connection helps in the process of research for both teachers and learners therefore making ICT integration in teaching and learning more effective.

4.6.3 Main ICT Infrastructure Challenge Faced at School

The researcher sought to establish the main ICT infrastructure challenge faced by teachers at school in their efforts to integrate ICT in teaching and learning. This information is summarized in Table 4.20.

Table 4. 20: Response for Teachers on the Main ICT Infrastructure Challenge Faced at School

Statement	SA		A		D		SD	
	no.	%	no.	%	no.	%	no	%
Poor internet connection	30	28.8	70	67.3	2	1.9	2	1.9
Frequent power failure	0	0	3	2.9	70	67.3	31	29.8
Lack of electricity	1	0.9	5	4.8	60	57.7	38	36.5
Lack of enough computers	60	57.7	41	39.4	3	2.9	0	0

From the table majority 70(67.3%) agreed and 30(28.8%) strongly agreed that poor internet connections affect integration of ICT in teaching and learning. 70(67.3%) of the respondents disagreed and 31(29.8%) strongly disagreed that frequent power failure affected ICT integration in their schools. 60(57.7%) disagreed and 38(36.5%) strongly agreed that lack of electricity affected ICT integration in their schools. However, 60(57.7%) strongly agreed and 41(39.4%) agreed that lack of enough computers affected the integration of ICT in teaching and learning. From this results majority feel that lack of enough computers and poor internet connection as the main infrastructural challenge facing their schools. Therefore, for ICT integration to be effective in schools there must be enough computers and a reliable internet connectivity.

4.6.4 How ICT Infrastructure can be Improved

The researcher also sought the suggestions on how ICT infrastructure can be improved to enhance ICT integration in teaching and learning. This information is summarized in Table 4.21.

Table 4. 21: Teachers View on How ICT Infrastructure can be improved

Statement	Frequency	Percentage
Equipping schools with modern computers	69	66.4
Investing in a reliable internet connection	28	26.9
Electricity installation with standby generators	7	6.7
Total	104	100

The findings indicate that 69(66.4%) cited equipping schools with modern computers, 28(26.9%) indicated investing in a reliable internet connection and only 7(6.7%) cited the need to have electricity installation with standby generators. From the table 69(66.4%) indicate that the main ICT challenge facing schools in their effort to integrate ICT in teaching and learning is lack of modern computers in schools. This is the basic requirements for any ICT class. Therefore, they must be made available and accessible for ICT integration to be effective.

4.7 Influence of School Management on the Integration of ICT in Teaching and Learning

The researcher sought to establish the extent to which school management influences the integration of ICT in teaching and learning in secondary schools.

4.7.1: School Management Importance in ICT Integration in Teaching and Learning

The researcher sought to establish whether school managers have an influence in the integration of ICT in teaching and learning. This information is summarized in Table 4.22.

Table 4. 22: Teachers Response as to Whether School Management is Important in ICT Integration in Teaching and Learning.

Statement	Frequency	Percentage
Strongly disagree	0	0
Disagree	0	0
Agree	72	69.2
Strongly agree	32	30.8
Total	104	100

From the findings most of the teachers 72(69.2%) agreed while 32(30.8%) strongly agreed that the school management plays an important role in the successful integration of ICT in teaching and learning. Therefore, any success in integration of ICT in teaching and learning is attributed to the overall support from school managers and teachers.

4.7.2: Teachers’ Ratings on Level of School Management Support in Integration of ICT at the School

The researcher further sought to establish teachers’ views on the level of school management support on ICT integration in teaching and learning in their schools. Teachers rated their school’s management support as summarized in Table 4.23.

Table 4.23: Teachers’ Ratings on School Management Support on ICT Integration

Statement	Frequency	Percentage
Poor	27	25.9
Below average	70	67.3
Average	2	1.9
Above average	5	4.8
Good	0	0
Excellent	0	0
Total	104	100

The research findings indicate that most of the respondents 70(67.3%) feel the support of school managers is below average, 27(25.9%) while 2(1.9%) felt that the school

management support was average and 5(4.8%) rated them as above average. From the result most of the teachers feel not fully supported by school management in the process of ICT integration in teaching and learning.

4.7.3: Availability of a Clear Policy on ICT Integration in Teaching and Learning in School

The researcher also sought to establish whether schools have a clear policy on ICT integration in teaching and learning. This information is summarized in Table 4.24.

Table 4. 24: Teachers Response on Whether There is a Clear Policy on ICT use in Their School.

Statement	Frequency	Percentage
Strongly disagree	0	0
Disagree	75	72.2
Agree	29	27.8
Strongly agree	0	0
Total	104	100

Majority of the teachers 75 (72.1%) disagreed that there was a policy on integration of ICT in teaching in their schools while 29(27.8%) agreed that their schools have a clear policy on integration of ICT in teaching and learning. From the results therefore most of the schools have no clear policy on ICT use in teaching and learning. This negatively affect the use of ICT in teaching and learning.

Table 4.25: Principals Response on Whether There is a Clear Policy on ICT use in Their School.

Statement	Frequency	Percentage
Strongly disagree	0	0
Disagree	10	90.9
Agree	1	9.1
Strongly agree	0	0
Total	11	100

10(90.9%) of the principals cited that there was no policy on ICT integration in their school while only 1(9.1%) agreed that there was a clear ICT policy in their school. This results show that there is no clear policy regulating ICT use in teaching and learning in most schools. This affect ICT use negatively. It shows the school principals being the policy makers therefore have failed in their role of ensuring that there is a clear policy regulating ICT use in their schools.

CHAPTER FIVE
SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND
RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the research findings, discussions, conclusions, recommendations of the study and suggestions for further research.

5.2 Summary of Findings of the Study

5.2.1 Questionnaire Return Rate

From the study 104 out of 136 questionnaire administered to teachers were filled in and returned the making a response rate of 76.47%. 11 principals from the 11 schools sampled filled and returned their questionnaire making a response rate of 100%. This response rate was considered very successful as the percentages were more than the required 75% which is considered adequate for generalization of results in research.

5.2.2 Teachers and Principals Demographics in ICT Integration

A majority of 70 (75.3) of teachers and 7(63.6%) of principals disagreed that gender had influence in integration of ICT in teaching and learning, 56(60.2) teachers and 5 (45.5) of principals agreed that age had influence in ICT integration, a majority of 50(48.1) of teachers strongly disagreed and 6 (54.5%) principals disagreed that work experience had any influence in ICT integration. From the study there was no significant relationship established between gender and ICT adoption. In academic qualification the findings showed no relation between level of education and ICT integration but most qualified teachers and principals had used ICT during their training and therefore had positive attitude towards its use. Age influenced ICT integration in that most young teachers were

more willing to use ICT in teaching and learning than old teachers and principals. Teaching experience however did not influence the use of ICT among teachers and principals.

5.2.3 How Training of Teachers and Principals Influence Integration of ICT in Teaching and Learning.

After analyzing and interpreting the quantitative data in relation to the objectives of the study, it was established that ICT competency affects integration of ICT in teaching and learning. 70(67.3%) of the respondents indicated as having training in ICT and 34(32.7%) had no any training in ICT. 84(80.8%) of this had certificate in computers (introduction to computers), 20(19.2%) indicated as being holders of a diploma while none had degree in ICT. According to Hennessy 2010 Teachers' ICT skills and access to professional development is critical to integration of ICT in teaching and learning. Shivashi (2010) states that teachers who do not consider themselves to be well skilled in using ICT feel anxious about using it in front of a class of students who perhaps know more than they do. Therefore, effective integration will depend to a larger extent on trained teachers.

5.2.4 Extent to Which Lesson Workload Influence Integration of ICT in Teaching and Learning.

Majority of the respondents 95.1% indicated as having a teaching load of between 21 to 25 lessons which according to them is very high. They also agreed that a high teacher's workload had a negative influence towards the integration of ICT in teaching and learning. These findings concur with the sentiments of Kipsoi (2012) who reported that teachers were already overloaded; they could not cope with the pressure and more so pressure from ICT training. Laaria, (2013) found out that teachers are overloaded to learn, at the same time teaching and preparing for teaching and practice what they learn. According to Andoh,

(2012) for teachers to realize the aims of educational system as well as implementing new initiatives, it is necessary to lessen their workload. According to the findings, majority of the respondents 71(68.27%) agreed that a teacher's workload greatly influence the integration of ICT in teaching and learning 23(22.12%) strongly agreed while none disagreed.

5.2.5 To Determine How the Availability of ICT Infrastructure Influence

Integration of ICT in Teaching and Learning.

Majority 45(43.3%) strongly disagreed and 47(45.19) strongly disagreed having convenient access to computers at school. This could be the reason for poor ICT integration since increased access to computers increase ICT use by teachers in teaching and learning process. Majority of the teacher respondents 79(75.9%) and 8(72.7%) of principals disagreed to having reliable internet connection in their schools. Albion (1999), states that decisions made by teachers about the use of computers in their classrooms are likely to be influenced by the accessibility and availability of relevant infrastructure. This shows that as internet reliability increases there is an increase in the use of ICT in teaching and learning.

5.2.6 Influence of School Administration in ICT integration in teaching and learning

All the respondents generally agreed that school administration had a very crucial role in the successful integration of ICT in teaching and learning. Majority of the teachers 70(50%) indicated that the school managers' level of support in ICT integration in their schools was below average. 27(25.9%) indicated school managers support as poor and only 7(6.7) was satisfied with the level of support they get from the school managers. These findings concur with those of a study conducted by Keiyoro et al (2010) which showed that

only 9.5% of teachers from NEPAD and cyber e-schools in Kenya indicated that the school principals were supportive of ICT integration and the support was linked to principals' belief in the usefulness of ICT in teaching and learning. This implies as the management increases support to teachers there will be more use of ICT in teaching and learning. Most of the respondents indicated as having no clear ICT policies in their schools. Generally, the respondents agreed that the school management needed to be more proactive in the efforts to integrate ICT in teaching and learning. There is need for school leadership to have clear ICT policies based on the level of the school.

5.3 Conclusion

Based on the findings of the study it can be concluded that teacher gender and experience does not influence integration of ICT in teaching and learning in public secondary schools in Gatundu South Sub County. But age influence ICT integration in that young people are more receptive of ICT use than old people.

Based on the findings of the study, it can be concluded that both head principals and teachers had been trained in basic computer literacy at certificate level but had no ICT training in their subject areas. This means they are limited in ICT competency, and therefore it can be concluded that there is need for in depth training of teachers in ICT in the respective subject areas in order to develop the competency and confidence needed to integrate ICT in teaching and learning.

It can be also concluded that teacher workload influence ICT integration in teaching and learning. For teachers to be effective therefore in ICT integration their workload should be reduced. This can be done by increasing the number of teachers such that workload is

distributed to a high number of teachers. This will give teachers enough time to enable them prepare for ICT lessons adequately.

The findings on the availability of ICT facilities in schools shows that computers are inadequate. In most schools there was poor internet connectivity, this reduced research by both teachers and principals making integration of ICT in teaching and learning ineffective. It is therefore necessary for principals to provide adequate computers and internet connectivity for their schools for use in teaching and learning. This would assist in improving the quality of education.

The findings also indicate that there was poor support from school administrators in matters of ICT integration in teaching and learning. This leads to poor integration of ICT in teaching and learning. School managers therefore should support ICT use for integration to be effective. This can be done by having clear policy on ICT use since most schools lack a clear policy on ICT use. School managers should also ensure there is required infrastructure in ICT use.

5.4 Recommendations

From the study, the recommendations below help in addressing respective groups to whom may find them relevant:

- i. A lot of teachers are still uneasy and anxious when it comes to using computers in classrooms as a result of their incompetence in ICT, they therefore, need to be trained in their subject area. In order to adopt a workable remedy, there is need for an assessment study which will address the inadequacies in ICT

- ii. Teachers should be provided with computer and internet connection packages at affordable payments. This is because they do not have enough time to prepare for ICT related content while they are at school, provided with such, they can do it when they get to their homes.
- iii. There is need for more teachers to be employed especially those with proficiency in computers to reduce lesson workload. Heavy teaching workload influences the integration of ICT into teaching and learning because teachers do not get adequate time to plan for and use the ICT facilities. This can be achieved through allocation of more funds to the Ministry of Education.
- iv. The government and other stakeholders like Computer for Schools Kenya (CFSK), NEPAD and other legalized Development Partners should help in equipping schools with adequate ICT resources and increase the number of the schools benefiting from the grants in the sub counties.

5.4 Suggestions for further Research

In this study a number of issues could not be comprehensively covered because of a wide range of limitations hence the following areas were suggested for further study.

- i. This study focused on Integration of ICT in teaching and learning in secondary schools in Gatundu South Sub County. The researcher recommends that further research can be carried out to establish the extent of ICT integration in other areas like in management of resources and finances at the school level.
- ii. In this study the focus was on the teachers and head teachers in public secondary schools. The researcher further recommends further research to be carried out to

establish the role of learners in integration of ICT in the learning process.

- iii. The study focused on public secondary schools only. The researcher further recommends further research be carried out in private secondary schools.

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APPENDICES-APPENDIX I

QUESTIONNAIRE FOR TEACHERS

This questionnaire is intended to collect data on teacher's participation in the integration of ICT in curriculum implementation in public secondary schools in Gatundu South Sub County. The data will be used for academic purpose only. Please answer in the spaces provided and tick (√) where appropriate. Do not write your name or the name of your school anywhere on this questionnaire. Answer all questions as honestly as possible. Your responses will be kept confidential.

SECTION A-DEMOGRAPHIC INFORMATION

1. What is your gender?

Male

Female

2. Indicate your age in the appropriate box

Less than 25 years

26-35 years

36-50 years

1-60 years

3. What is your highest Academic qualification?

Diploma

Degree (B.Ed.)

BA/BSC with PGDE

Masters

4. How long is your teaching experience?

Less than 5 years

6-10 years

11-15 years

16-20 years

Over 20 years

SECTION B. ICT COMPETENCIES AMONG SECONDARY SCHOOL TEACHERS

1. ICT competency influences integration of ICT in teaching and learning.

Strongly agreed () Agreed () Strongly disagreed () Disagreed

2. Teachers have training on ICT use as a tool for teaching and learning.

Strongly agreed () Agreed () Strongly disagreed () Disagreed

3. What level of training do teachers possess?

Certificate

Diploma

Degree

4. What challenges do you face in your efforts to integrate ICT in your teaching?

.....
.....

SECTION C. INFLUENCE OF TEACHERS' WORKLOAD ON ICT

INTEGRATION IN TEACHING AND LEARNING.

1. What is your teaching load? (No. of lessons taught in a week)

(a) Below 15 lessons.

(b) Between 15 and 20.

(c) Between 21 and 25.

(d) Between 26 and 30.

(e) Above 30 lessons.

2. Teachers lesson workload influence ICT integration in teaching and learning.

teaching and learning?

Strongly agreed () Agreed () Strongly disagreed () Disagreed

3. State three ways in which a high teachers' workload negatively influences ICT

integration in teaching and learning.

.....

SECTION D-THE EXTENT TO WHICH ICT INFRASTRUCTURE INFLUENCES
THE INTEGRATION OF ICT IN TEACHING AND LEARNING.

1. Teachers have a convenient/consistent access to computers at school.

Strongly agreed () Agreed () Strongly disagreed () Disagreed

2. There is a reliable internet connection in your school.

Strongly agreed () Agreed () Strongly disagreed () Disagreed

3. What is the main ICT infrastructure challenge that you face personally in school?

(i) Lack of electricity

(ii) Poor internet connectivity

(iii) Frequent power failure

(iv) Lack of enough computers

4. In your opinion, what do you think should be done by schools to improve on ICT
infrastructure?

.....

.....

SECTION E-THE EXTENT TO WHICH, SCHOOL ADMINISTRATION INFLUENCE
THE INTEGRATION OF ICT IN TEACHING AND LEARNING.

1. School management has a vital role in the integration of ICT in teaching and
learning.

Strongly agreed () Agreed () Strongly disagreed () Disagreed

2. In your opinion, how would you rate the level of support on ICT integration from
your school administration? Tick (√) appropriately.

(a) Poor

(b) Below average

(c) Average

(d) Above average

(e) Good

(f) Excellent

3. There is a clear policy on integration of ICT in teaching and learning.

Strongly agreed () Agreed () strongly disagreed () Disagreed

APPENDIX II

QUESTIONNAIRES FOR SCHOOL PRINCIPALS

Kindly respond to all the questions in the questionnaires

SECTION A-DEMOGRAPHIC INFORMATION

1. What is your gender?

Male

Female

2. Indicate your age in the appropriate box

Less than 25 years 26-35 years

36-50 years 51-60 years

3. What is your highest Academic qualification?

Diploma

Degree (B.Ed.)

BA/BSC with PGDE

Masters

4. How long is your teaching experience?

Less than 5 years

6-10 years

11-15 years

16-20 years

Over 20 years

SECTION B-INFLUENCE OF TEACHERS ICT COMPETENCY ON ICT

INTEGRATION IN TEACHING AND LEARNING.

1. How many teachers in your school are ICT competent in its use?

.....

2. Computer training of teachers is important in improving teacher's ICT skills.

Strongly agreed () Agreed () Strongly disagreed () Disagreed ()

3. There are enough educational resources in school to integrate ICT in teaching.

Strongly agreed () Agreed () Strongly disagreed () Disagreed ()

4. How would you rate the level of ICT competency among your teachers?

(a) Poor (b) Below average

(c) Average (d) Good

(e) Excellent

5. What do you think should be done to improve on teachers' competency in the use of

ICT tools in teaching and learning?

.....

SECTION C-THE EXTENT TO WHICH A TEACHERS' WORKLOAD INFLUENCES THE INTEGRATION OF ICT IN TEACHING AND LEARNING.

1. On average what is the workload of your teachers?

(a) Below 15 lessons (b) Between 15-20

(c) Between 21-25 (d) Above 25 lessons

2. Teachers lesson workload influences the integration of ICT in teaching and learning

Strongly agreed () Agreed () Strongly disagreed () Disagreed

3. What do you think should be done to deal with the problem of high teachers'

workload?

.....

.....

SECTION D-THE EXTENT TO WHICH ICT INFRASTRUCTURE INFLUENCES THE INTEGRATION OF ICT IN TEACHING AND LEARNING.

1. Teachers have convenient/consistent access to computers in school.

Strongly agreed () Agreed () strongly disagreed () Disagreed

2. There is a reliable internet connection in your school.

Strongly agreed () Agreed () strongly disagreed () Disagreed

3. ICT infrastructure influences the integration of ICT in teaching and learning.

Strongly agreed () Agreed () strongly disagreed () Disagreed

4. In your view, what are the major challenges of integrating ICT in teaching and

learning?.....

SECTION E-THE EXTENT TO WHICH, SCHOOL ADMINISTRATION INFLUENCES ICT INTEGRATION IN TEACHING AND LEARNING.

1. (i) School management has a vital role in the integration of ICT in teaching and learning.

Strongly agreed () Agreed () strongly disagreed () Disagreed

(ii) If you agree with the above statement, in what ways do the managers in your school support teachers in their efforts to integrate ICT in teaching and learning?

.....
.....

2. (i) There is a clear policy on ICT integration in teaching and learning in your school.

Strongly agreed () Agreed () Strongly disagreed () Disagreed