

**FACTORS INFLUENCING INTEGRATION OF INFORMATION AND  
COMMUNICATIONS TECHNOLOGY IN MUSIC CURRICULUM IN  
SECONDARY SCHOOLS IN NAIROBI COUNTY, KENYA**

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**A Research Project Submitted in Partial Fulfillment of the  
Requirements for the Degree of Master of Education in  
Curriculum Studies**

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**DECLARATION**

I hereby declare that this project is my original work and it has not been submitted for an award of a degree in this or any other university.

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## **DEDICATION**

To my beloved wife, Esther Nzive and my sons John Mbithi and George Mutisya.

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## **LIST OF ABBREVIATIONS AND ACRONYMS**

ASEAN	The Association of Southeast Asian Nations
CAI	Computer Aided Instruction
CD-ROM	Compact Disk Read-only Memory
CEMASTEA	Centre for Mathematics, Science and Technology Education in Africa
DVD	Digital Versatile Disc
ICT	Information and Communication Technology
IDM	Internet Download Manager
KICD	Kenya Institute of Curriculum Development
KTTC	Kenya Technical Teachers College
MIDI	Musical Instrument Digital Interface
MOEST	Ministry of Education Science and Technology
NISET	National ICT Strategy for Education and Training
PPPs	Public-Private Partnerships

## ABSTRACT

Information Communication and technology is a prerequisite for global competitive quality education, training and research for development. The study aimed at analyzing the factors influencing ICT integration in music curriculum in Nairobi County, Kenya. To achieve this, research objectives were formulated on the extent to which ICT had been integrated in the school music curriculum. These objectives were to determine the influence of physical facilities, to analyze the influence of teaching and learning resources, to assess the influence of school leadership and to determine the influence of in-service teacher training in integration of ICT in music curriculum in secondary schools.

The study adapted description survey design. The study targeted 26 public and 8 private secondary schools, 214 teachers and 520 students of music in form three and four. Out of this a sample size of 272 students and 136 teachers of music, and all 34 head teachers was selected using Kothari's (2004) formula to calculate a sample size. Data were analyzed through description statistics and presented in form of tables and figures.

The study findings indicated that majority (75.4%) of the music teachers and head teachers recognized the value attached to ICT integration in the music curriculum. Concerning the availability ICT facilities and resources, teachers of music indicated inadequate computer laboratories (81.1%) and electricity (19.7%). Support from school management was represented fairly by 41.5 percent. Established also was that in order to improve integration in school curriculum, most teachers of music (73.5%) and head teachers (41.2%) respectively recommended for teachers in-service courses in ICT integration. In conclusion, it was noted that given the right conditions, integration of ICT in secondary school music curriculum would provide the teachers of music with opportunities to improve professionally through in-service courses of ICT. Teachers of music and head teachers' positive attitude toward ICT integration could reckon the provision of ICT infrastructure, facilities and equipment which could enable the realization of effective integration.

The study therefore recommended that schools be equipped with adequate ICT music facilities and resources. In addition, teachers and head teachers should take lead in promoting ICT integration by registering for higher level of education where computers are a prerequisite. In addition every school should adapt the national ICT policy and plan for its implementation. Last a similar study should be conducted on the impact of ICT integration in music curriculum.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background to the study**

Since the advent of the computer, new developments and technologies are constantly changing how we view and interact with the world. Computers and the internet, which were once tools of convenience, have now become integral parts of everyday life. The advent has led to developments and changes not only in business sectors but also in education and music education in particular.

The integration of Information and Communication Technology (ICT) into the school curriculum has become the major issue worldwide. ICT provides a window of opportunity for educational institutions and other organizations to harness and use technology to complement and support the teaching and learning process. Toomey (2000) defines ICT as a tool for teaching and learning that relates to those technologies that are used for accessing, gathering, manipulating and presenting or communicating information. This means that ICT is a dynamic resource or tool that can be used for different purposes in the pedagogical environment especially in the music classroom. The education system pursues the integration of ICT into the music curriculum because of the role it is perceived to play in the changing curriculum.

Educational systems around the world are under increasing pressure to use the new information and communication technologies (ICT) to teach students of music the knowledge and skills they need in the 21st century. Within the past

decade, the new ICT tools have fundamentally changed the way people communicate in matters pertaining music. They also have the potential to transform the nature of music education: where and how learning takes place and the roles of students and teachers in the learning process.

The challenge confronting our educational systems is how to transform to the music curriculum and teaching-learning process to provide students with the skills to function effectively in this dynamic, information-rich, and continuously changing environment. ICTs provide an array of powerful tools that may help in transforming the present isolated, teacher-centred and text-bound music classrooms into rich, student-focused, interactive knowledge environments. To meet these challenges, learning institutions must embrace the new technologies and appropriate ICT tools for music learning. They must also move towards the goal of transforming the traditional paradigm of learning music. Music-specific technologies can create an interactive learning environment that is uniquely tailored to meet individual student's musical needs. Music software now has the ability to conduct playing tests, supplement music theory education, and allow students of all ages to participate in composition and notation activities. Student learning has moved beyond the traditional classroom and the opportunity to enhance their learning can now take place in new and varied environments.

ICT integration initiatives in secondary education in the Republic of Korea centered around four specific tasks namely; building information infrastructure, strengthening ICT education, teacher training for ICT use, and development and

dissemination of educational digital contents (Korea Education & Research Information Service, 2001).

In the United States of America (USA), similar ICT initiative was spearheaded during the Clinton administration through the initiative dubbed 'Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge, where all students benefit from the use of educational technology. At the heart of this challenge were four concrete goals that helped to define the task at hand, that is all teachers in the nation would have the training and support they needed to help students of music learn using computers and the information superhighway, all teachers and students would have modern multimedia computers in their classrooms, every classroom would be connected to the information superhighway and effective software and on-line learning resources would be an integral part of every school's curriculum (U.S. Department of Education, 2000). There is substantive implementation of ICT use in education, especially in the music curriculum, in these Korea and the USA as the initiatives are well supported through government policies.

In 2006 the Ministry of Education (MOE) in Kenya, sector partners and stakeholders developed the National ICT Strategy for Education and Training (NISET) aimed at guiding the sector in the adoption of ICTs across all levels of education and training. The strategy was developed taking into consideration the policy environment captured in the National ICT Policy of 2006 and sector policy in Sessional Paper No. 1 of 2005. Through the Options Paper for the Ministry of

Education, Science, and Technology (MOEST) 2005, among the initiatives to be realized were e-content development, ICTs in Teacher Training Colleges, computers in secondary schools and ICT Infrastructure development.

The ICT in Education baseline survey group in its report the 'ICT Capacities Competencies in Selected Secondary Schools 2009/2010' indicated that teachers of music were not at all applying ICT in their professional practice; especially in most public schools in urban Nairobi province. This was due to poor infrastructure, counteracting digital divide, underdeveloped teaching and learning resources, inadequate in-servicing of teachers, ineffective school leadership support and insufficient funding (Kiptalam 2010).

The Centre for Mathematics, Science and Technology Education in Africa (CEMASTEIA) personnel noted that the majority of ICT trained teachers were beginners with basic skills which were mostly acquired in pre-service or commercial college training (Menjo 2007). Howie (2004) argues that even in the event of ICT competent teachers, continuous staff development is necessary to ensure that teachers are coping with changing technologies. Therefore, while teacher development is important, ICT leadership is even more necessary for effective ICT implementation. Effective leadership is one of the key variables that determine the success of an educational institution and strategic leadership is needed for long-term sustainability of school improvements (Davis, 2003). Rakes (2003) supported the claim that leadership is a key factor when it comes to merging ICT and instruction. Baylor and Ritchie (2002) also described leadership

as a critical predictor of ICT integration in music curriculum, since it focuses on promoting the use of ICT at a strategic and action level. Most of the school heads in Kenyan secondary schools do not possess the necessary ICT knowledge to make defined decisions. This makes them reluctant to support the ICT initiatives in their schools, especially in subjects like music which are considered as important (Yusuf and Yusuf, 2009).

Hardware, educational digital content and software are obvious resources that should be available. Teachers also need other types of resources, such as onsite computer support. Teachers often need technical assistance as well as pedagogical support such as advice on choosing relevant music software and integrating it into instruction. Kenya Institute of Curriculum Development (KICD) initiated its policy on integration of ICT in teaching of various subjects in Kenyan secondary schools. This was done without considering students' background, subject content and the teachers' training. Music was not included and this made it difficult for teachers to integrate ICT in their music teaching activities and so continued using talk- chalk approach in their teaching activities (Yusuf & Yusuf, 2009).

It is recognizable that the national curricula developed at KICD needs to be transformed from text to digital format in order to facilitate integration of ICT in delivery of music among other education programmes. In 2011, Intel Corporation and the KICD announced a joint commitment to roll out a digital educational curriculum model that would transform how students interact with their teachers in the classroom. This is a digital model that has been promoted in other countries

like South Africa, Egypt, Libya, Nigeria, Zambia and Ghana. The progress has however been rather slow and the music curriculum is yet to be transformed to digital format (Farrell, 2007). The researcher also noted that studies done by Melita (2010) on ICT integration in Kenya indicated that there was a big gap in ICT skills between average Kenyan student and teaching staff and students and teaching staff of comparable economies around the world. He concluded that the government and individuals need to address this technology gap so that Kenyan citizens can compare globally with others.

### **1.2 Statement of the problem**

Kenya has made remarkable progress putting an ICT policy framework and implementation strategy, complete with measurable outcomes and timeframes. The process has had the benefit of sound advice from officials and stakeholders, head teachers and teachers of music, and perhaps more importantly, strong leadership from the office of the Permanent Secretary of the MOE (Glen 2007). The process has also been supported by Computer for Schools Kenya (CFSK) a project which was started in 2002 to equip students and staff with modern ICT skills required for computing in today's modern economy (Farrell, 2007). The CFSK has been encouraging all schools to integrate ICT in learning and teaching so as to realize its full potential. Although over a thousand public schools, among them those taking music as an examinable subject in Nairobi County, have received computers, their use in the classroom level is limited due to issues

affecting ICT integration (Yusuf & Yusuf, 2009) hence the need for the study to investigate the factors influencing integration of ICT in music curriculum in secondary schools in Nairobi County, Kenya.

### **1.3 Purpose of the study**

The purpose of this study was to investigate the factors influencing integration of ICT in music curriculum in secondary schools in Nairobi County, Kenya.

### **1.4 Objectives of the study**

The objectives of the study were:

- i. To determine the influence of physical facilities in integration of ICT in music curriculum in secondary schools.
- ii. To analyze the influence of teaching and learning resources in integration of ICT in music curriculum in secondary schools.
- iii. To assess the influence of school leadership in integration of ICT in music curriculum in secondary schools.
- iv. To determine the influence of in-service teacher training in integration of ICT in music curriculum in secondary schools.

### **1.5 Research questions**

The study was guided by the following research questions:

- i. How do physical facilities influence integration of ICT in music curriculum in secondary schools?

- ii. How does teaching and learning resources influence integration of ICT in music curriculum in secondary schools?
- iii. How does school leadership influence integration of ICT in music curriculum in secondary schools?
- iv. How does in-service teacher training influence integration of ICT in music curriculum in secondary schools?

### **1.6 Significance of the study**

It is hoped that the findings of the study may provide the Ministry of Education with data on how secondary school head teachers are implementing this integration of ICT in education programmes. The study may contribute through the development of knowledge which the head teachers and teachers of music could use to deal with the emerging challenges in the course of the implementation of this innovation. It is also hoped that the study will assist education planners and enable Quality Assurance Officers during their visits to schools to give proper guidance to the schools managers on the best approaches of handling the emerging challenges while implementing this innovation.

Study findings may assist the donors and other well wishers in assessing the level of needs in the implementation of this innovation. The study will add to the body of knowledge of secondary education in technological innovation in music besides filling gaps in research which could prompt other researchers to do similar studies in other regions or levels of education.

### **1.7 Limitations of the study**

The study was limited by the fact that it would not be possible to control some variables. For example, there could be variation in the capacity of the music teachers due to experience and training.

In data collection, the study relied on questionnaires, which included self-assessment measures for music teachers and interview guides for head teachers. The researcher employed methodological triangulation with a view to double checking results. This is also called "cross examination". The method was used so as to corroborate information given by the respondents.

### **1.8 Delimitations of the study**

The study was carried out in Nairobi County, Kenya. This was because the county is endowed with most private and public schools that take music as an examinable subject and readily available ICT resources for teaching music.

### **1.9 Assumptions of the study**

The study was carried out on the basis of the following assumptions that:

- i. The respondents who were teachers of music and head teachers would give the correct information.
- ii. The respondents would be knowledgeable about the subject.
- iii. The public and private secondary schools' teachers of music were aware of the existing technologies in music education.

### **1.10 Definition of significant terms**

Specific terms have been used in the study whose meaning is explained below.

**Computer aided instruction** refers to the use of personal computers for education and training.

**Hardware** refers to physical components of a computer or a communications system, including both mechanical and electronic parts, such as the processor, hard drive, keyboard, screen, cables, mouse and printer.

**ICT Infrastructure** refers to ICT systems, services and networks.

**ICT Integration** refers to a range of learning environments from a stand-alone computer in a classroom to a situation where the teaching is done by the computer through pre-packaged “teacher-proof courseware”

**In-service teacher training** refers to further teacher professional development.

**School leadership** refers to the head teachers, principals and the directors in school.

**Teaching and learning resources** refers to texts, videos, software, and other materials that teachers use to assist students to meet the expectations for learning.

**Physical facilities** refer to ICT hardware and computer laboratories.

### **1.11 Organization of the study**

The study is organized in five chapters. Chapter one deals with the background to the problem, problem statement, purpose of the study, objectives of

the study, research questions, significance of the study, limitations and delimitations, assumptions of the study and definition of the significant terms. Chapter two covered the review of related literature.

An examination of a brief historical perspective on the development of technology and computer-aided instruction, and the factors influencing integration of ICT in music curriculum in secondary schools, namely; physical facilities in relation to ICT, development of teaching and learning music resources, school leadership in relation to ICT integration and in-service for teachers' professional development for ICT use. A critic of the empirical research done in the related area of study is dealt with. It also contains a theoretical framework and a conceptualization of the researcher and a summary of literature review. Chapter three of this study covers the research design and methodology. The location, population size, sampling procedures and techniques used in the development and administration of research instruments are described. The methods of data collection and analysis are described. In chapter four, the field data is presented in tables, pie charts and analyzed. Chapter five contains a discussion of the research findings; conclusions and recommendations derived from the research findings. Suggestions or further research are made in this chapter.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter deals with available literature related to this study. The chapter begins with a brief historical perspective on the development of technology and computer-aided instruction (CAI) and the current uses of technology in the music classroom. Focus is given to the following factors: school leadership in relation to ICT integration, physical facilities in relation to ICT, development of teaching and learning music resources, and in-service teachers' professional development for ICT use.

#### **2.2 Development and use of technology in music education**

In an effort to outline the development of computer-aided instruction and the use of computers in the music classroom, Peters (1992) categorized the history of the development of CAI for music. The categories were divided into five generations of development. The first generation of development is generally seen as beginning in the 1960s (Douglas, 2000). This period is characterized by the use of large computers in research environments. In 1967, researchers at Stanford University began working on a device to analyze an individual's performance through the use of a computer. Their goal was eventually to use this computer to develop more efficient methodology and create the first example of computer-

aided instruction in the music classroom (Kuhn and Allvin, 1967). Two years later, Deihl and Radocy (1969) began to develop other avenues for uses of computers in music education. They proposed not only the use of computers as a guided tutorial to visual and aural skills in music theory, but also as a way for individuals to receive feedback from a performance. At approximately the same time, Lincoln (1969) began to discuss future uses of computers in music and music research, including the use of computers for music notation and sequencing, music information organization and playback, and computer-aided instruction. Those ideas have been far surpassed by modern technologies, but the fundamentals of his ideas are seen in many music classrooms today.

The second generation of CAI in music education came with the introduction of the personal computer. With the development and release of the Apple II in 1977, followed by the International Business Machines (IBM) personal computer in 1981, a revolution began to occur in personal computing (Weyhrich, 2001). Computers were reasonably affordable, manageable, desktop machines. Their availability, ease of use, and ease of programming brought these computers to the forefront of academic computing.

The third generation occurred with the development of the MIDI (Musical Instrument Digital Interface) standard in 1983 (Jones, 2003). During this period, the types and variety of software began to expand.

Peters' fourth generation of music CAI began with the development of multimedia presentation methods that provided a much wider variety of

educational programs. This generation is defined by the evolution of CAI software beyond simple drill-and-practice, and into the areas of guided instruction, games, and exploratory and creative software. Webster (2002) comments this time period for the development of programs to support melodic, rhythmic, and harmonic dictation, error detection, and music composition. During this period, more complex software also began to develop, including programs to assist the development of improvisation skills, automated accompaniment, and the first software that could be adapted to serve individual student needs.

Peters' fifth generation follows the emergence of the internet into mainstream education. Bowyer (2000), while researching computer-based educational music programs, concluded that the evolution of the music CAI was already emerging on the internet and would continue to grow as high-speed internet becomes more readily available. Currently, CAI in the music classroom is utilizing both fourth and fifth generation. The resourcefulness of music teachers has allowed them to incorporate outside technologies into their lessons. The YouTube site has uploaded many of the resources that are useful for use in the music classroom such as western and African music. The resources are free and can be downloaded through download programmes such as the Real player and IDM (Internet Download Manager).

Following the 20 years' explosion of the development of music CAI software, Williams and Webster (2005) categorized music CAI software into four

distinctive categories currently seen in classrooms: Drill-and-Practice, Flexible Practice, Simulation, and Multimedia. Much of the research on the use of CAI in the music classroom utilizes or examines software from one or more of these categories. Drill-and-Practice software, the most commonly studied category, is categorized as software that has a primary purpose of reinforcing musical concepts already taught in the classroom or by an instructor. Examples of this type include Music Ace, which works on note reading and basic musical concepts, and Adventures in Musicland, which help to introduce music concepts. Studies into this type of CAI include Willett and Netusil's (1989) study on note learning, and Smith's (2002) study on rhythm reading skills.

Flexible Practice software provides an environment of feedback for individual practice. Some software, such as Practica Musica and Vivace, provide guided practice, while programs like SmartMusic simply provide performance feedback. Studies of this type of CAI can be seen as early as Kuhn and Allvin's 1967 study.

More recently, Klee (1998) and Glenn (2000) conducted studies on the use of computer assisted accompaniment, finding that while there were no advantages to student outcomes, the software provided viable alternatives to traditional instruction. Simulation software provides users with a means of notating ideas and then playing them back, whether through traditional notation software such as Finale, or through less traditional software such as Morton Subotnick's Making Music. Nelson (2007) has researched the use of notation software in music

education. Schachter's (1999) study utilized the research and designed a Piano Instruction Curriculum based around the use of simulation CAI.

The purpose of Multimedia CAI software is to enhance students' learning experiences through the use of a variety of multimedia. Programs such as Composer Quest introduce young students to composers and musical concepts through interactive visual and audio stimulus. Dobbe (1998) studied not only the effect of multimedia music CAI, but also other multimedia software on music learning, determining that learning enhanced through the use of multimedia shows a positive significant outcome on student learning.

Understanding the primary types and the effects of music CAI in the classroom is important, but the use of technology in the music classroom goes beyond simple predefined software programs. The resourcefulness teachers of music have allowed them to incorporate outside technologies into their lessons

### **2.3. Physical facilities in relation to ICT integration in music curriculum**

In an early study on the factor of integration of technology in the classroom, Hadley & Sheingold (1993) determined that teachers were more likely to use computers in their classrooms when technology was available, when there was technological support, when there was time available to learn and plan for the use of technology, and when there was support from educational leaders. Boone (2005) determined in a survey of urban school teachers that preparation and

planning time, access to technology resources, and technology training were still barriers to teacher technology integration. A country's educational technology infrastructure sits on top of the national telecommunications and information infrastructure. Before any ICT-based programme is launched, policymakers and planners must carefully consider the following:

In the first place, are appropriate rooms or buildings available to house the technology? In countries where there are many old school buildings, extensive retrofitting to ensure proper electrical wiring, heating/cooling and ventilation, and safety and security would be needed.

Another basic requirement is the availability of electricity and telephony. In developing countries large areas are still without a reliable supply of electricity and the nearest telephones are miles away. Experience in some countries in Africa point to wireless technologies (such as VSAT or Very Small Aperture Terminal) as possible levers for leapfrogging. Although this is currently an extremely costly approach, other developing countries with very poor telecommunications infrastructure should study this option.

Policymakers should also look at the ubiquity of different types of ICT in the country in general, and in the educational system (at all levels) in particular. For instance, a basic requirement for computer-based or online learning is access to computers in schools, communities, and households, as well as affordable Internet service.

Currently in most secondary schools in Kenya, there is limited capability for effective use and maintenance of ICT infrastructure at the educational institutions as well as support from educational leaders, namely head teachers and officials from the MOE. Most schools use less than 40% of the available ICT infrastructure and therefore there is need to ensure optimum use of ICT resources by students, teachers and administrators in order to exploit the educational potential of the technology (National ICT Strategy for Education and Training-MOE, 2006).

Rashotte (2004) found that technology integration in the classroom does not necessarily relate to the technology proficiency of the teacher. Through teacher interviews and questionnaires of technologically proficient teachers, she found that while technology was used in the classroom, it was only used to the minimum expectations of the curriculum. In this case, factors attributing to the lack of use included personal limitations, job stability, and lack of resources. Another study determined that, although teachers had the barriers of limited resources and time, not all teachers were affected by these barriers the same way. (Woods, 1999) Teachers with higher-level visions of technology in the classroom were more likely to integrate technology and overcome barriers. Classroom organization was critical to teachers who used computers to support the curriculum.

Most institutions in Kenya, according to the Flemish Association for Development Cooperation and Technical Assistance (VVOB) still use nearly obsolete systems and are consequently unable to exploit the educational potential

of the emerging technologies. Presently in most of Kenya's secondary schools, ICTs are not well integrated to enhance subject matter learning. This is due to the lack of adequate computer to student ratios as well as the current focus on ICTs as a subject matter rather than to enhance the curriculum (Farrell, 2007).

#### **2.4 Teaching and learning music resources in relation to ICT integration in the music curriculum**

E-content development is a critical area that is too often overlooked. There is a need to develop original educational content, for example radio programs, interactive multimedia learning materials on CD-ROM or DVD and Web-based courses, adapt existing content, and convert print-based content to digital media. These are tasks for which content development specialists such as instructional designers, scriptwriters, audio and video production specialists, programmers, multimedia course authors, and web-developers are needed.

There has been an emergence of national and regional school networks, or SchoolNets, that facilitate the sharing of content and information; curriculum guides, teaching and learning resources, tele-collaborative project registries, school and teacher directories, training curricula and materials, research and policy papers, technology management guides, music software and start-up toolkits, among others. Countries like Australia, France, Finland, Japan, Canada, Thailand, Ghana, South Africa, Zimbabwe and Kenya to name a few, all have national SchoolNets. In Southeast Asia, efforts are currently underway to pilot

SchoolNets in the Philippines, Indonesia, Cambodia, Laos, Myanmar and Vietnam, and to link these to existing national SchoolNets to create a region-wide ASEAN SchoolNet (Brannigan, 2010).

In Web-based learning, technical standardization of content has also become a pressing issue. Standardization allows different applications to share content and learning systems. According to Brannigan specifications in music teaching and learning content, structure, and test formats are in place in UK so that interoperability may exist between different management systems, resulting in some cost-efficiencies. Standards must be general enough to support all kinds of learning systems and content. The ease by which Web-based educational content can be stored, transmitted, duplicated, and modified has also raised concerns about the protection of intellectual property rights. For instance, are intellectual and property rights violated when lectures broadcast over the television or on the Web incorporate pre-existing materials, or when students record educational broadcast or musical applications on tape for later viewing?

The Kenya ICT Trust Fund was formed in 2004, with the aim of spearheading ICT initiatives in education. The objective was to facilitate public-private partnerships (PPPs) that will mobilize and provide ICT resources to Kenyan public schools and community resource and learning centres. This is yet to be realized (Omwenga, 2007).

## **2.5 School leadership in relation to ICT integration in the music curriculum**

According to Brannigan (2010) leadership is one of several critical components in the successful integration of ICTs 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 ICT in education and imprint it on the minds of teachers has been attributed to lack of leadership capacity (Moyle, 2006). As a result, today's school principals must not only manage the day to day routine activities of a 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 this idea Fullan, (2003), stated that administrators should understand the elements and characteristics of long-range planning for the use of current and emerging technology; demonstrate an ability to analyze and react to technology issues, concepts and proposals; possess a “ big-picture” vision of technology in education and schools; use technology to communicate efficiently with staff, parents and the community; use technology directly to collect and analyze data and other information that can improve decision-making and other management functions; understand how current and available technologies can be integrated effectively into all aspects of the 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.

Although school heads generally support ICT use, they do not seem to have a particular vision and strategy of ICT integration in education (Gakuu and Kidombo, 2010). Some literature has delved into the crucial role of school leadership in ICT integration in education, and shows how school leadership can hinder or facilitate schools adoption of ICT (Fullan, 2003). For example, when the ICT integration tasks are given to one teacher or a small team of teachers who focus more on infrastructural management rather than technology innovation in teaching, staff development and ICT research are more likely to suffer. According to Fullan (2003), the reasons why this role is not played effectively is still not clear, hence need for more studies. Fullan (2003) and Yuen (2003) also stress the importance of relationships in an organization and emphasize the need for the School Principal to build a team learning environment in which teachers can communicate with each other on ICT experience and reinforce each other's effective practice, thus paving the way for knowledge sharing, especially for tacit knowledge, which refers to skills, beliefs, and understanding below the level of awareness.

## **2.6 In-service for teachers' professional development for ICT use**

While many factors do affect the likelihood of integration, the one overwhelming manipulative factor is that of professional development in technology. With such great emphasis placed on having the skills necessary and

the knowledge to integrate, professional development is essential for successful technology integration. According to most surveys, the majority of in-service teachers both at primary schools and secondary schools have minimal to no ICT literacy or integration skills; however, outreach to this community of teachers is very important in an overall ICTs strategy. Currently Computers for Schools Kenya, and to a smaller extent SchoolNet Kenya and KTTC under the VVOB, are conducting ICT foundations and integration workshops for INSET teachers.

Professional education provides three things that increase the likelihood of teacher integration. First, through continued technology education, teachers become more comfortable and confident with technology, which in turn increases their likelihood of integration (Ceppi-Bussmann, 2006). Second, through continued exposure to technology in an educational environment, more positive perceptions of technology in the classroom are made (Moulton, 2005). Finally, with continued use of technology, a wider range of skills are developed, a greater understanding of how it works is created, and true integration is more likely to take place (Stubbs, 2007).

## **2.7 Summary of the literature review**

This section has outlined the status of ICT integration in the music curriculum. ICT integration in schools could be simply viewed as the use of computers in the teaching and learning process. This view would clearly misjudge the complex nature of the integration procedure itself. By integrating, we understand combining parts together, so that they work together to make a whole.

The 'parts to be combined' include the school context in which integration is to take place, the technologies provided, the technical skills of teachers, the technical support provided for the installation, maintenance and upgrading of hardware and software, the pedagogical preferences and skills of teachers, the availability of appropriate electronic resources and finally, the skills and motivation of students. However, integration has always been taken to mean to teach students basic computer skills in Kenya.

## **2.8 Theoretical Framework**

The study was based on Everett Rogers's Diffusion of Innovations theory (Rogers, 2003). Diffusion of Innovations seeks to explain how innovations are taken up in a population. An innovation is an idea, behaviour, or object that is perceived as new by its audience. Diffusion of Innovations offers three valuable insights into the process of social integration, which is firstly what qualities make an innovation spread successfully, secondly the importance of peer-peer conversations and peer networks and thirdly understanding the needs of different user segments.

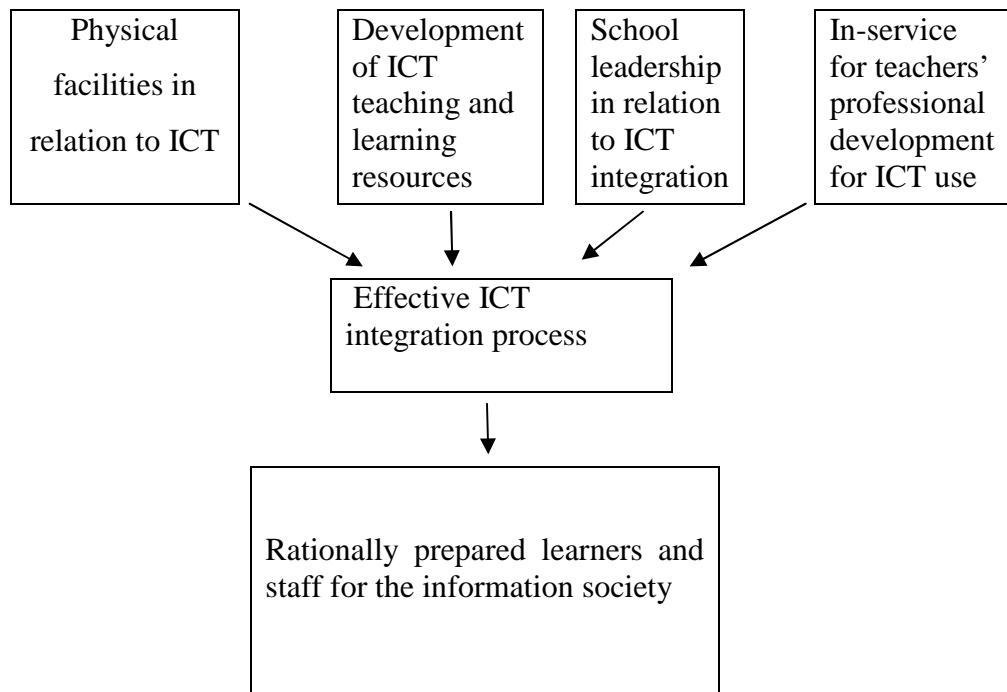
Diffusion of Innovations takes a radically different approach to most other theories of integration. Instead of focusing on persuading individuals to change, it sees integration as being primarily about the evolution or "reinvention" of products and behaviours so as to fit better for the needs of individuals and groups.

This study employed the Everett Rogers's Diffusion of Innovations theory to determine the factors influencing integration of ICT in music curriculum in secondary schools in Nairobi County, Kenya. The applicability of the theory in the study could be seen in the fact that the theoretical process had a bearing on the quality of education. The desired outcomes of ICT integration in music curriculum are provision of quality secondary education to every Kenyan child graduating from secondary schools, regardless of gender, ethnic background, or socioeconomic status.

## 2.9 Conceptual Framework

**Figure 2.1**

### **Integration of ICT in the secondary school music curriculum**



The conceptual framework indicates that the availability of adequate physical facilities accompanied by development of ICT teaching and learning resources, could determine school leadership support and regular in-service teacher training towards ICT integration in secondary schools. If the relationship in the variables could be correctly linked both students and teachers of music would achieve and appreciate the ideas and knowledge of the ICT integration in the music curriculum.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1. Introduction**

This chapter presents the procedures that were used to conduct the study, focusing on research design, target population, sample and sampling procedures, research instruments, and data collection and analysis, aimed at determining factors that influence ICT integration in secondary schools.

#### **3.2. Research design**

This study employed a descriptive survey research design. Descriptive survey research designs are used in preliminary and exploratory studies to allow researchers to gather information, summarize, present and interpret for the purpose of clarification (Orodho, 2002). On the other hand they give the purpose of descriptive research as determining and reporting the way things are. The study fitted within the provisions of descriptive survey research design because the researcher collected data and reported the way things were without manipulating any variables. The method therefore provided a lot of information on the factors that influence ICT integration in the music curriculum in secondary schools in Nairobi County, Kenya.

#### **3.3. Target population**

Target population is defined as all the members of a real or hypothetical set of people, events or objects to which a researcher wishes to generalize the

results of the research study (Borg & Gall, 1989). The researcher targeted 34 head teachers, 214 teachers of music, and 520 students of music in forms 3 and 4 from 26 public and 8 private secondary schools that were taking music as an examinable subject during the time of the study, in Nairobi County. (Nairobi County Education Office March, 2011).

### 3.4. Sampling procedures and sample size

The credibility of a research study is judged by the size of the sample. In choosing a sample size, this study focused on an optimum size of at least 300 participants based on a confidence level of 95 percent. This implies 1.96 was the standard variate for 95 percent confidence (Kothari, 2004).

The study applied Kothari's (2004) formula to calculate a sample size:

$$n = \frac{Z^2 \cdot p \cdot q \cdot N}{e^2 [N - 1] + Z^2 \cdot q}$$

Where n = size of sample

Z = the value of the standard variate at a given confidence level

p = sample proportion

q = 1 – p

e = acceptable error

N = size of population

Basing on this formula the researcher then determined a sample size for the teachers from the entire population of 214 teachers of music.

$$\frac{(1.96)^2(0.95)(1-0.95)(214)}{(0.05)^2(214-1)+(1.96)^2(0.95)(1-0.95)}$$

$$\frac{\quad}{\quad} = 39.049864 \qquad = 54.6170277 \qquad \approx 55 \qquad 0.714976$$

The study involved 55 teachers of music from 34 secondary schools. However, in each school, approximately 4 teachers were involved ( $214/55 = 3.89 \approx 4$ ). In total the study involved 136 teachers of music (that is,  $34 \times 4$ ).

Basing on this formula the researcher also determined a sample size for the students of music from the entire population of 520.

$$\frac{(1.96)^2(0.95)(1-0.95)(520)}{(0.05)^2(520-1)+(1.96)^2(0.95)(1-0.95)}$$

$$\frac{\quad}{\quad} = 94.88752 \qquad = 64.114228 \qquad \approx 64 \qquad 1.479976$$

Since in each school 4 students of music were involved, that is 2 from each class of forms Three and four ( $520/64= 8.125 \approx 8$ ). In total the study involved 272 students of music ( $34 \times 8$ ).

### **3.5 Research instruments**

Questionnaires for teachers and students of music, and interview schedules for the head teacher were developed and used by the researcher. The questionnaires were used for data collection because they offered considerable advantages in the administration and comprised of both close-ended and open ended items. Gay (1992) maintains that questionnaires give respondents freedom to express their views or opinion and also to make suggestions. The questionnaires of teachers of music comprised of five sections. Section one collected the background information of teachers of music. Each of the other four sections collected information related to the factors that influence ICT integration in the music curriculum in relation to physical facilities, teaching and learning resources, school leadership and in-service teacher training. The questionnaires of students of music comprised of two sections, the first section based on awareness of music technology and the second section based on integration of ICT in the music classroom.

### **3.6 Instrument validity**

Validity is defined as the accuracy and meaningfulness of inferences, which are based on the research results (Mugenda & Mugenda, 1999). In other words, validity is the degree to which results obtained from the analysis of the data actually represents the phenomena under study. Before the actual data was collected, the researcher conducted a pilot study. Simple random sampling technique was adopted to select two schools, two (2) head teachers, four (4) teachers of music and eight (8) students of music who took part in the pilot. The pilot study helped to improve face validity of the instruments. According to Borg and Gall (1989) content validity of an instrument is improved through expert judgment. As such, the researcher sought assistance of his supervisors, who, as experts in research, helped improve content validity of the instrument.

### **3.7 Instrument reliability**

To determine instrument reliability, the raw scores from questionnaires of the teachers and students of music, and the interview guides of head teachers were summarized, coded, edited and then the information synthesized to reveal the essence of data. The open and closed ended questions were analyzed qualitatively and quantitatively respectively. Qualitative data, for ease of analysis, was first coded then assigned numeric value. The results for the teachers and students of

music questionnaires were then used to calculate the reliability using the Pearson Product Moment Correlation formula (Best & Kahn, 2006).

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

The correlation coefficient was then adjusted to reflect the entire test length using Spearman Brown Prophecy formula (Best & Kahn, 2006).

$$r = \frac{2r}{1+r}$$

The correlation coefficient for each of the pilot study instrument was correlated as shown in appendix E where the correlation reliability was 0.96 for the teachers of music and 0.90 for the students of music questionnaires respectively. Given that the positive co-efficient reliability ranges from 0 to 1, the reliability value of 0.96 and 0.90 are significant and therefore, the instruments were considered reliable (Spiegel, 1992).

### **3.8. Data collection procedure**

A research authorization letter was first of all sought from the department of Educational Administration and Planning, University of Nairobi to assist in obtaining a permit from the National Council for Science and Technology (NCST) that be used in conducting the study. Before administering the

questionnaire, copies of the permit were submitted to the County Commission and County Education offices, Nairobi County. The researcher contacted the head teachers prior to the actual research. Teachers and students of music were given at least 3 days to complete the questionnaires. Five to ten percent of the non-respondents from the list of non-respondents were selected at random using the table of random numbers by picking those whose numbers appeared first, then calling them or visiting them (Tuckman, 1994).

### **3.9. Data Analysis techniques**

The research yielded both qualitative and quantitative data. Qualitative data was analyzed qualitatively using content analysis based on analysis of meanings and implications emanating from respondents information and documented data. As observed by Gray (2004) qualitative data provides rich descriptions and explanations that demonstrate the chronological flow of events as well as often leading to chance findings. Quantitative data was analyzed using various statistics including measures of central tendency and dispersion. Quantitative data analysis required the use of a computer spreadsheet, and for this reason Statistical Package for the Social Sciences (SPSS) version 20 was used. The results of data analysis were presented using frequency distribution tables, pie charts and bar graphs.

## **CHAPTER FOUR**

### **DATA ANALYSIS, INTERPRETATION AND DISCUSSION**

#### **4.1 Introduction**

This chapter comprises analysis of data and the findings of the study. The general objective of the study was to investigate the factors influencing integration of ICT in music curriculum in secondary schools in Nairobi County, Kenya. The first section of the chapter presents the demographic data of the respondents. Section two presents data on the influence of physical facilities in integration of ICT in music curriculum in secondary schools. Section three of the chapter covers data on the influence of teaching and learning resources in integration of ICT in music curriculum in secondary schools. Section four of the chapter presents data on the influence of school leadership in integration of ICT in music curriculum in secondary schools. Finally section five covers data on influence of in-service teacher training in integration of ICT in music curriculum in secondary schools.

#### **4.2 Questionnaire return rate**

Two sets of questionnaires were used to collect data for this study: the students and teachers of music questionnaires. Figure 4.1 shows both the students and teachers of music questionnaires received back dully completed.

**Figure 4.1:**

**Questionnaire Return Rate**

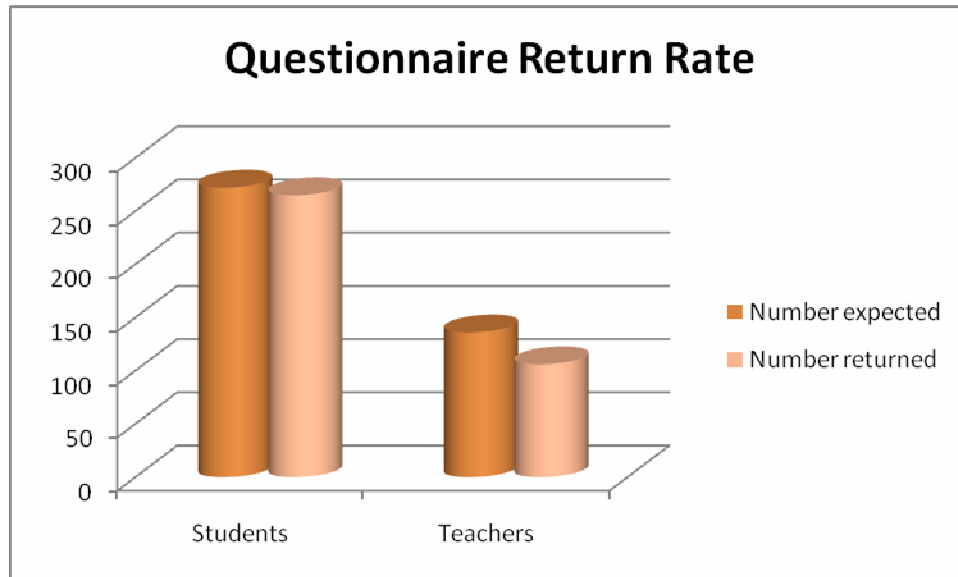


Figure 4.1 shows that 136 teachers of music and 272 students of music were questionnaires were distributed. One hundred and six (106) teachers of music and two hundred and sixty five (265) students of music questionnaires were returned dully completed. This represented 77.9% and 97.4% return rate respectively. The questionnaire return rate was considered reliable for the purpose of the study. The return rate was not a 100% due to the problem of absenteeism and reluctance to participate among some of the students and teachers of music despite enlightenment of the purpose of the study and assurance of confidentiality would be upheld.

### **4.3 Demographic data**

The study sought demographic data of the respondents including gender, level of education, work experience and type of music class one teaches. The study was carried out in secondary schools in Nairobi County, Kenya. The study was conducted among 34 head teachers and 136 teachers of music. Analysis of biographical data revealed that, of the teachers of music that responded in the study, 50 percent were males and 50 percent females, an even percentage. As for the head teachers, there were 44.4 percent males and 55.6 percent females who participated.

#### **4.3.1 Education Level of the Head teachers and Teachers**

The study sought to find out the education levels of head teachers and teachers of music in the study. Academic and professional qualifications of head teachers and teachers of music are key determinants to be considered for the ICT integration in the music curriculum. Information and Communication Technology integration in the music curriculum requires trained staff to design and support the process of integration to help the students who are not skilled. Table 4.1 shows the respondents' level of education.

**Table 4.1:**

**Education Level of the Head teachers and Teachers of Music**

Education level	Headteachers		Teachers	
	No	%	No	%
Masters Degree	25	78.1	28	26.4
Bachelor's Degree	7	21.9	49	46.2
Diploma	0	0.0	17	16.1
PGDE	0	0.0	12	11.3
Total	32	100	106	100.0

Table 4.1 shows that majority of the head teachers 78.1 percent had Masters Degrees while 21.9 percent had Bachelor's Degrees. Majority of the teachers of music 46.2 percent had a Bachelor's degree, followed by 26.4 percent who had a Masters Degree. Integration of ICT in the music curriculum requires adequate skills. School head teachers and teachers of music need various skills in order to cope with the demands of their management and teaching tasks. Such skills can be attained through formal training. It is encouraging to note that most head teachers had a Masters degree and teachers of music had a Bachelors degree.

**4.3.2 Work experience of Head teachers and Teachers of music**

The head teachers and teachers of music were asked to indicate their work experience in the schools, to which they responded as shown in Figure 4.2.

**Figure 4.2:**

**Work experience of Head teachers and Teachers of music**

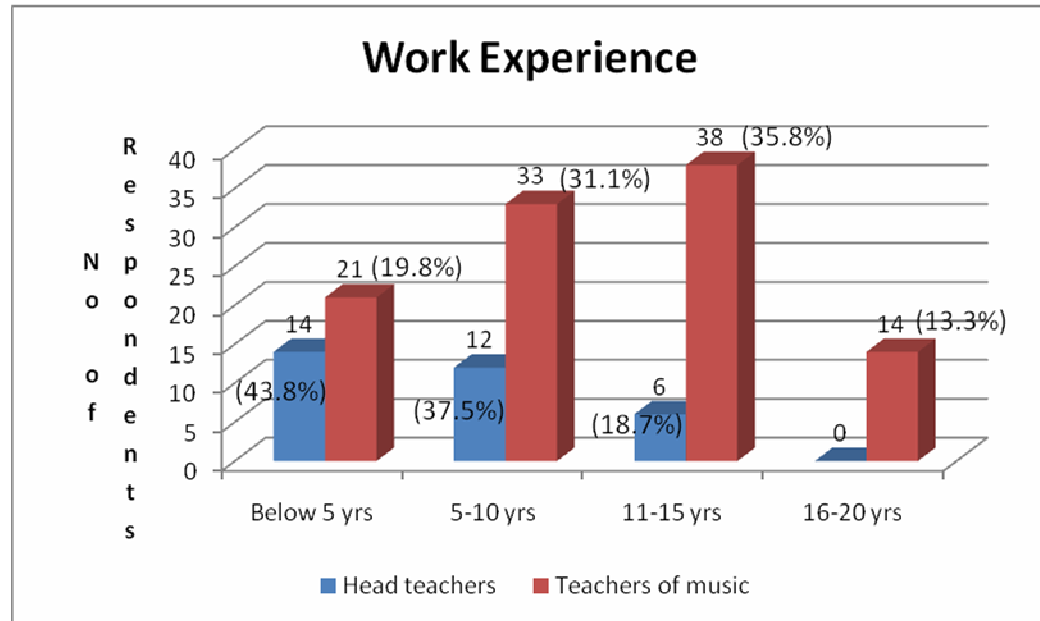


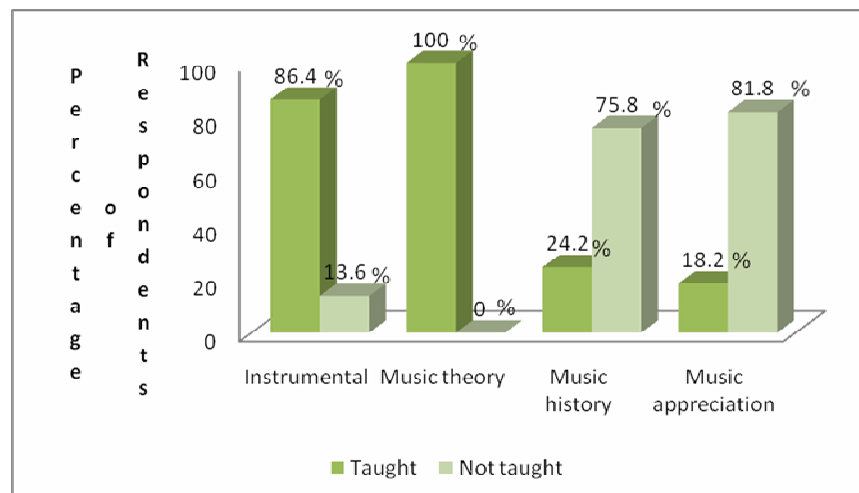
Figure 4.2 shows that there were 43.8 percent of the head teachers had worked for less than five years with 37.5 percent having worked for five to ten years. Only six (18.7%) head teachers had worked between 11 – 15 years, while none had worked for over 15 years. As for the teachers of music, 35.8 percent had worked for 11 - 15 years, 31.1 percent had worked for 5 – 10 years, and 13.3 percent had worked for 16 – 20 years. Based on these results, it could be said that majority of the respondents had worked for a long time, so they had enough experience to do their jobs accordingly, and were in a position to give useful insights into the factors that influence the integration of ICT in music curriculum in secondary schools.

### 4.3.3 Type of music class taught by teachers of music

The study sought to find out the type of music class taught by teachers of music. This was considered in the study because it determines the type and the quantity of technology required by the teachers of music for effective integration of ICT. The responses by the teachers of music are represented in figure 4.3.

**Figure 4.3:**

**Type of Music Class taught by Teachers of Music**



According to figure 4.3, 86.4 percent of the teachers of music conduct instrumental lesson as opposed to 13.6 percent. All teachers of music have music theory lessons. Music history is taught by a small percentage (24.2%) of teachers of music while 18.2 percent teach music appreciation. Music history and appreciation are classes that are less taught in secondary schools. These are knowledge subjects and computer integration in the classroom, which is the

application of technology to assist, enhance, and extend student knowledge could be lacking in these schools.

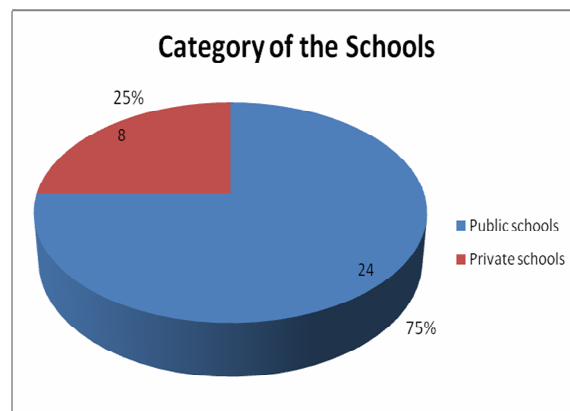
#### 4.3.4 Category of the school

The category of the school was also considered because it determines funding ability of the kind of ICT facilities and equipment available for the integration of ICT in the music curriculum in a given secondary school category.

Figure 4.4 below displays the category of schools.

**Figure 4.4:**

#### Category of the School



75 percent of the schools were public school while 25 percent were private schools. A smaller percentage of private secondary schools in Nairobi county conduct music as an examinable subject, an indicator that only selected financially able schools attempt the subject.

#### 4.3.5 Students of music response to importance of technology

The study also sought to establish the students of music respond to importance of technology. This was important because the results would help in establishing whether the students of music gave importance to music technology, thus prompting for its support in integrating it in the curriculum. Their responses were as shown in table 4.2 below according to whether they; strongly disagreed (SD), disagreed (D), were neutral (N), agreed (A) or strongly agreed (SA).

**Table 4.2:**

**Students of Music Response to Importance of Technology**

<b>Items</b>	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
Is music technology beneficial?	2	4	20	60	179
Music technology influences my life	102	89	53	12	9
Do the methodologies motivate?	183	53	6	15	8

According to the results in table 4.2, 67.5 percent (179) of students of music strongly agreed that music technology was beneficial to them. When asked whether music technology influences their lives, it was surprising to note that majority of the students of music (102) strongly disagreed; while only 8 strongly agreed that the methodologies motivate them. In the second and the third items on music technology influence and motivation on methodologies, the negative numbers may have been contributed by the fact that in most schools there was no

available or not enough technologies to have any impact or motivation on the students' lives.

#### **4.4. Influence of physical facilities in integration of ICT in music curriculum in secondary schools.**

The study sought to find out the influence of physical facilities in integration of ICT in music curriculum in secondary schools. To determine this, the teachers of music were asked to rate the adequacy or inadequacy of ICT physical facilities in their schools, to which they responded as shown in Table 4.3.

**Table 4.3:**

#### **Teachers of music view on the Availability of ICTs Physical Facilities**

<b>Item</b>	<b>N</b>	<b>VA</b>	<b>%</b>	<b>A</b>	<b>%</b>	<b>IA</b>	<b>%</b>
Computers with music software	106	0	0.0	31	29.2	75	70.8
Computer laboratories with appropriate music hardware	106	0	0.0	20	18.9	86	81.1
Electrification for computers with appropriate cabling	106	2	1.9	46	43.4	58	54.7
There are adequate projectors	106	0	0.0	18	17.0	88	83.0

According to subject responses, 29.2 percent of respondents felt that computers for the purpose of music education were adequate, a great percentage of 70.8 percent indicated that they were inadequate. 81.1 percent of respondents pointed out that computer laboratories with appropriate music hardware were not

available for use at school, while 1.9 percent of respondents indicated that electrification for computers with appropriate cabling was very adequate. It was noted this 1.9 percent was recorded from the private schools' category. 83.0 percent of respondents clearly pointed out that there were no adequate projectors for use in the music classroom. ICT equipped classrooms and computer laboratories, according to teachers, were inadequate.

Hadley and Sheingold (1993) determines that teachers were more likely to use computers in their classrooms when technology was available, when there was technological support, when there was time available to learn and plan for the use of technology. The inadequacy of these facilities could make it difficult for head teachers and teachers of music to perform their functions adequately and could also compromise the quality of secondary music education in the country. To concur with the above, students of music were asked in question 2 on which day(s) music lessons were conducted in the computer laboratory. In response to this the results are indicated in table 4.4.

**Table 4.4:**

**Music Lessons in a Computer Laboratory**

Days	Number of students	Number of schools
Monday	0	0
Tuesday	15	1
Wednesday	16	1
Thursday	13	1
Friday	25	2
Total	69	5

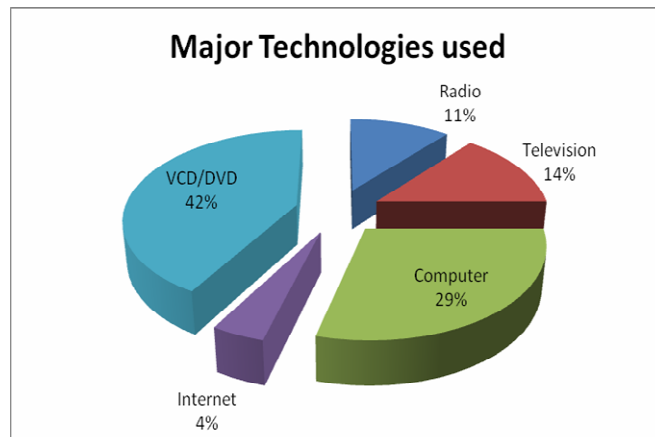
Only five (5) schools conducted music lessons in a computer laboratory, which is 14.7 percent. A total of sixty nine (69) students of music benefited from this ICT facility out of the possible 265 forming 26 percent. These results concur with the responses given by teachers of music in question 7 of the teachers' questionnaire on availability of computer laboratories with appropriate music hardware for use at school. According to Farrell (2007) presently in most of Kenya's secondary schools, ICTs are not well integrated to enhance subject matter learning. This is due to the lack of adequate computer to student ratios as well as the current focus on ICTs as a subject matter rather than to enhance the curriculum.

Head teachers were asked what major technologies were promoted among students of music. This question was important because it is the type of ICTs used

that determines the degree of success and integration of ICT in the music curriculum. The following were the responses given in figure 4.5.

**Figure 4.5:**

**Major Technologies promoted among Students of Music**



The most commonly used technology with 42 percent was the VCD/DVD devices with the computer 29 percent being the next commonly used. The internet was not used in most schools. This could be attributed its unavailability in most secondary schools due to infrastructure and high costs.

**4.5 Influence of teaching and learning resources in integration of ICT in music curriculum in secondary schools.**

The study also sought to find out the influence of teaching and learning resources in integration of ICT in music curriculum in secondary schools. To determine this, the teachers of music were asked also to rate the adequacy or

inadequacy of ICT teaching and learning resources in their schools, to which they responded as shown in Table 4.5.

**Table 4.5:**  
**Teachers of Music View on the Availability of ICTs Teaching and Learning Resources**

<b>Item</b>	<b>N</b>	<b>VA</b>	<b>%</b>	<b>A</b>	<b>%</b>	<b>IA</b>	<b>%</b>
Computers for the purpose of music education	106	0	0.0	28	26.4	78	73.4
ICT music textbooks with appropriate music activities	106	4	3.8	36	34.0	66	62.2
I-boards for computers with appropriate music worksheets	106	0	0.0	26	24.5	80	75.5

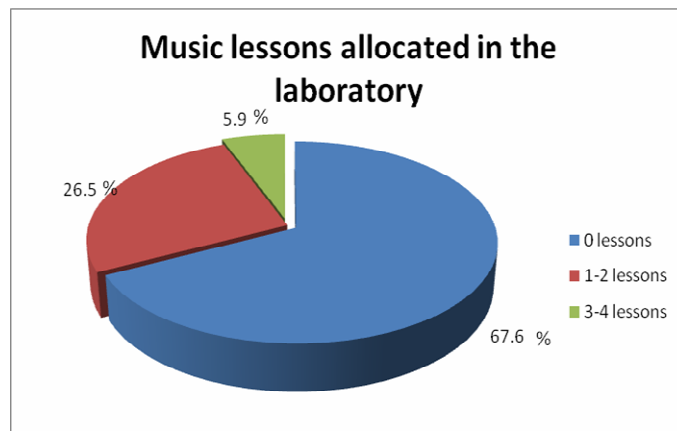
According to this table, 78 teachers of music pointed out that computers for the purpose of music education were inadequate. Four teachers (3.8%), all drawn from private schools felt that they had very adequate numbers of ICT music textbooks with appropriate music activities for use in their music classrooms; compared to 62.2 percent who indicated that the same resources were inadequate. 75.5 percent did not have the required I-boards for computers with appropriate music worksheets.

Both the teachers and students of music indicated that very few lessons were conducted in the computer laboratory. Computer-Aided Instruction (CAI), diverse

and rapidly expanding spectrum of computer technologies assist the teaching and learning process. Computer-Aided Instruction is also known as computer-assisted instruction. Examples of CAI applications include guided drill and practice exercises, computer visualization of complex objects, and computer-facilitated communication between students and teachers. Dobbe (1998) studied not only the effect of multimedia music CAI, but also other multimedia software on music learning, determining that learning enhanced through the use of multimedia shows a positive significant outcome on student learning.

Lack of computer aided resources becomes a barrier to CAI and this affects student learning. This is expressed in figure 4.6.

**Figure 4.6:**  
**Number of lessons allocated for music lessons in the computer laboratory weekly**



According to figure 4.6, only a small percentage of 5.9 percent of schools have music lessons allocated weekly in a computer laboratory. Majority of schools (67.6%) have no allocations at all. It can therefore be deduced that the cause of this large number could be attributed to inadequate teaching and learning resources in majority of the secondary schools in Nairobi County. Nine secondary schools out of the thirty four forming only 26.5 percent have an allocation of 1-2 lessons a week.

Students of music were asked whether the software used by the teachers of music was relevant for the music technology content, in question 12. It was necessary to gather such information because this could reveal whether music technology lessons in the computer laboratory were purely based on the intended content. The students gave the following responses in table 4.6.

**Table 4.6:**

**Content Relevance**

Responses	%
Always	23
Not always	67
Total	100

According to table 4.6, only 23 percent of students of music responded that the music technology content was always relevant while a majority of students of

music who had their lessons in the laboratory reported that the content was not always relevant. This could have been as a result not having the relevant software for music technology. The Kenya ICT Trust Fund was formed in 2004, with the aim of spearheading ICT initiatives in education. The objective was to facilitate public-private partnerships (PPPs) that would mobilize and provide ICT resources to Kenyan public schools and community resource and learning centres. This was yet to be realized (Omwenga, 2007).

#### **4.6 Influence of school leadership in integration of ICT in music curriculum in secondary schools.**

The study also sought to find out the influence of school leadership in integration of ICT in music curriculum in secondary schools. The teachers of music were ask to rate the school leadership through specific questions in the teachers’ questionnaire. The teachers of music responded as represented in table 4.7.

**Table 4.7:**  
**Teachers’ rating on school leadership**

Item	No.	Agree	%	Disagree	%
Support by H/teacher	106	44	41.5	62	58.5
Visits by head teacher	106	31	29.2	75	70.8
Recognition by BOG	106	33	31.1	73	68.9
Problem solving H/teacher	106	29	27.4	77	72.6

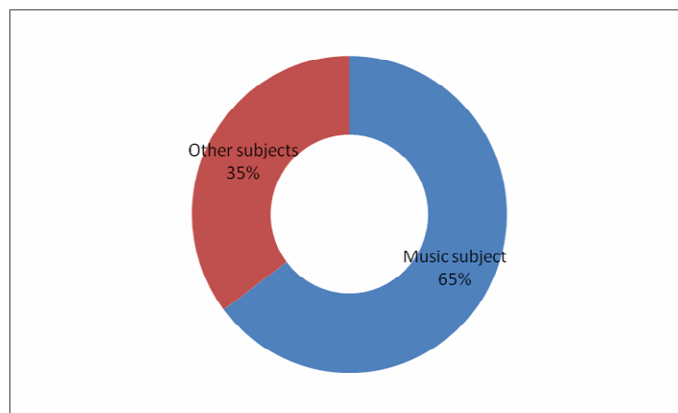
Table 4.7 shows that 41.5 percent of the teachers of music indicated that there was support from the head teachers to use technology, while 58.5 percent indicated that there was no support. Visits by the head teacher in the classroom were acknowledged by 29.2 percent in contrast to 70.8 percent of the teachers of music. A small proportion of 31.1 percent of teachers of music agreed that the BOG recognized the use of technology in music. Majority, 72.6 percent of teachers of music agreed that there was no support from the head teacher while 27.4 percent agreed.

Based on this analysis, it emerges that the most teachers pointed out that their problems in relation to use technology in the music classroom was not adequately addressed by the head teachers in their schools. According to Brannigan (2010) leadership is one of several critical components in the successful integration of ICTs 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. Hence as concluded by Leech and Fulton (2008), “Twenty-first century school leaders must ...” empower “...followers and” renew “their commitment to the organization's vision. Re-engineering the learning organization must be a vision shared by all members of the school community and led by the head teachers.

In the teachers of music questionnaire from three schools, some of them alluded to the challenge of not receiving sufficient support from the school management. Teachers reported that even the school management team needs to

be trained in order to be able to support the integration of ICT in their schools. The study sought to investigate whether other subjects were taught instead during the music lesson. Responses from teachers of music indicated that 35.3 percent of schools taught other subjects during the music lesson. This could have been attributed to lack of support and interest from the school leadership. This was presented in figure 4.7.

**Figure 4.7:**  
**Schools teaching other subjects instead of music**



Teachers of music in 35 percent of the secondary schools in Nairobi County often substituted music with other subjects during the music lesson. This had an indication that majority of teachers of music, even those trained to use of music technology were reluctant to do so and that subject-matter teachers of music were reluctant to consider the implementation of computers in teaching. The relatively cautious position of the subject-matter teachers could perhaps have

been first due to their limited experience with software and hardware, and second to the uneasiness about changing their habits and techniques. Recent report by the National Council for Science and Technology (2010) indicated that computer use in Kenyan classrooms is still in its early phases, and concluded that the perceptions and experiences of teachers and administrators do play an important role in the use of computers in Kenyan classrooms.

Students of music were asked whether the parents were involved in the use of music technology. This question was important because the success of this integration could be accelerated by parents' moral and financial support. The students of music responded as shown below in table 4.8.

**Table 4.8:**

**Parental Involvement**

Responses	%
Never	75
Sometimes	25
Total	100

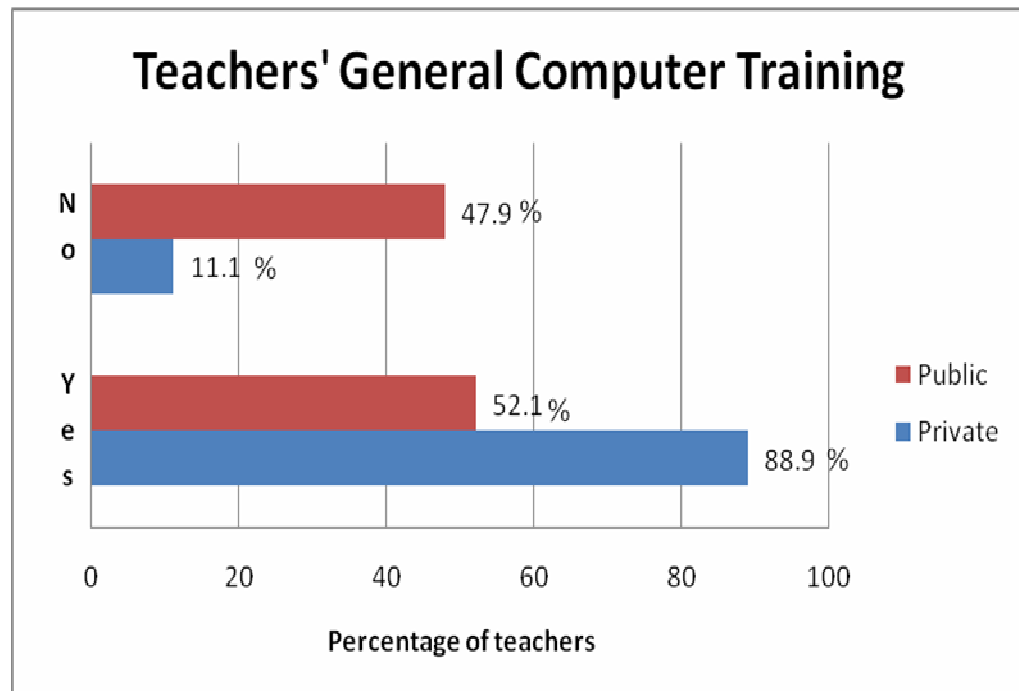
From table 4.8, there is enough evidence that parents and guardians are not involved in their children's work because 75 percent of the parents are not directly influencing their children positively. This could be attributed to lack of ICT knowledge and skills on the part of the parents.

#### 4.7 Influence of in-service teacher training in integration of ICT in music curriculum in secondary schools.

In-service and training is a very important remedy in the integration of computer education in the school curriculum. The study sought to find out whether in-service sessions for teachers have paved way for the incorporation of computer education and technology in the school set up. When questioned on their general computer training, teachers of music responded as shown in figure 4.8.

**Figure 4.8:**

#### Teachers' General Computer Training



Most teachers (88.9%) in private secondary schools indicated that they had received general computer training while in public secondary schools a slight percentage above a half (52.1%) had received such training. Majority of teachers of music in schools had computer training and most of them had some sound working knowledge of computers. This was necessary because with the required facilities and resources, integration of ICT in music curriculum could be a reality. Teachers do not need to learn about technology; they need to learn how to use technology to enhance their learners' understanding and critical thinking skills. Enhancing basic information and communication skills like reading, writing, and speaking should be the focus of using ICT in education, not simply ICT literacy. For this reason the study also sought to investigate teachers of music with ICT music technology training. The data is displayed on figure 4.9.

**Figure 4.9: Teachers with ICT Music Technology Training**

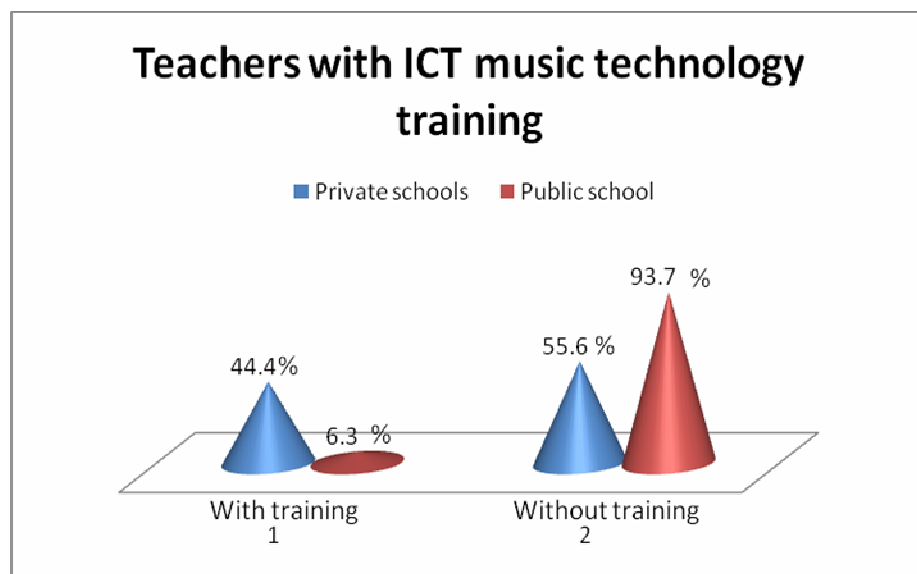


Figure 4.9 shows a relatively small number with music technology training in both private and public secondary schools at 44.4 percent and 6.3 percent respectively. Based on this analysis integration may be affected negatively. This is because ICT integration is supposed to consider learning pedagogy, the pattern of student use of ICT, and the extent of use in teaching and learning programmes. Scalisi (2005), in a study on the impact of staff development, determined that novice teachers were overwhelmed by the new material, and that more one-on-one communication should occur. She also noted that adaptation during the development experience should occur to make it more meaningful to individuals. For ICT to be integrated in the music curriculum it requires that teachers of music are well trained on use of music technology. It could also be a reflection of the need to update teachers' knowledge in the world of fast moving technology of communication.

In question 4 head teachers were also asked about their computer literacy, to which they gave their responses as indicated below in table 4.9.

**Table 4.9:**

**Head teachers with ICT training**

<b>Items</b>	<b>Number</b>	<b>%</b>
School-based ICT training	12	37.5
Private ICT training	16	50.0
Not trained in ICT	4	12.5
<b>Total</b>	<b>32</b>	<b>100</b>

A total of 87.5 percent of head teachers had received general packages in ICT training, that is use of Microsoft word, either privately or through government programs. This is encouraging because for ICT integration to be successfully integrated in the music or any other subject curriculum, the head teachers need to have knowledge of the dynamics involved.

When asked on the preparedness of teachers of music while conducting a music technology class in question 9, the students gave their responses as follows in table 4.10.

**Table 4.10:**

**Teacher Preparedness**

Responses	%
Sometimes	67
Always	33
Total	100

Table 4.10 shows that 67 percent of teachers of music were inadequately prepared during the music technology classes even though they had the facilities and resources. This could have been due to lack of training on the pedagogical use of ICT in music teaching. Studies have revealed that whether beginner or experienced, ICT related training programs develop teachers' competences in computer use, influence teachers' attitudes towards computers as well as assisting teachers reorganize the task of technology and how new technology tools are

significant in student learning (Plair, 2008). Muller (2008) related technology training to successful integration of technology in the classroom. This could explain why some teachers of music are more prepared than others.

Through the open-ended questions 12 and 25, head teachers and teachers of music gave suggestions on a number of issues as indicated in table 4.11.

**Table 4.11:**

**Recommendations by Head teachers and Teachers of Music**

Item	Headteachers		Teachers	
	No	%	No	%
ICT Teacher in-service	14	41.2	18	73.5
Power and cabling	7	20.6	13	19.7
Building computer labs	2	5.9	4	6.1
Government sponsorship	6	17.6	2	3.0

From table 4.11, the results indicate that most teachers of music (73.5%) and head teachers (41.2%) recommended for teacher in-service courses on ICT integration. This is an important aspect because if the teachers of music were allowed to go for in-service courses on ICT they would be comfortable to apply the skills in teaching and learning. Others teachers of music advocated for the need to equip the schools with power and adequate cabling (19.7%), build computer laboratories (6.1%) and government sponsorship (3.0%).

In the same question 25 on what suggestions or possible measures would the teachers of music like to give for improvement of ICT integration in the music curriculum, a higher percentage (67%) of those who mentioned the budget for teaching and learning resources said that the budget was not enough. Other teachers of music, which is 33 percent, responded that they had enough but then the funds were diverted for other resources which were not related to ICT integration in the music curriculum. This is shown in table 4.12.

**Table: 4.12**

**Budget for Teaching and Learning Resources**

Responses	%
Enough	33
Not enough	67
Total	100

From table 4.12 above, it is clear that the money allocated to purchase teaching and learning resources is not enough. Teachers of music indicated that their schools were under-resourced. This shows that there is a shortage of learning and teaching material. Teachers of music also commented that the software provided had insufficient information and were therefore not suitable.

#### **4.8 Summary**

The chapter attempted to statistically establish whether the variables under study would enhance the integration of ICT in the secondary school curriculum in Nairobi County, Kenya. Data analysis established that some schools in Nairobi County lacked essential ICT facilities and resources for teaching and learning.

The study showed that besides computers for teaching and learning, few schools used other ICT devices to enhance ICT integration in the music curriculum. It also established that teachers of music had a positive attitude towards ICT integration in the secondary school music curriculum. The study, therefore established that there was need for in-service courses in ICT for teachers of music especially in music technology and to equip schools with ICT facilities and resources for teaching and learning.

## **CHAPTER FIVE**

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

#### **5.1 Introduction**

The chapter provides a brief summary of the study, conclusions and recommendations of the study. The study also offers suggestions for further research.

#### **5.2 Summary of the study**

The main purpose of the study was to analyze the factors that influence ICT integration in music curriculum in secondary schools in Nairobi County, Kenya. The study focused on the stated objectives by targeting head teachers' and teachers' of music demographic data. In addition, the study focused on ICT factors concerning integration in secondary school's music curriculum. To achieve this, the research objectives were formulated on the factors that influence ICT integration in the music curriculum in secondary schools in Nairobi County. Thereof, research questions were postulated.

To generate and refine the study ideas, the literature review was essential to enhance knowledge and clarity to the research questions postulated. The variables of the study were summarized in the conceptual framework that showed their interrelatedness. That is from the in-put to the process and then from the process to out-put.

The study used descriptive survey design and simple random sampling techniques to select head teachers and teachers of music who would participate in

answering questionnaire items. The target population was 34 head teachers, 136 teachers and 272 students of music. To obtain the exact number of the teachers and students of music per school who would take part in answering questionnaire items, Kothari's (2004) formula for calculating sample size was adopted.

Data was collected using students and teachers of music questionnaires, and head teachers' interview guide and analyzed using mainly descriptive statistics, particularly frequencies and percentages. Statistical Package for Social Sciences (SPSS) was used for effective analysis of data. To realize the objectives of the study, findings were presented and conclusions drawn.

A few students take computer studies in many schools in Nairobi County. The study established that this was due to inadequate computers in some schools and even lacked the facilities. The study also revealed that internet and electrification in some schools was a challenge. Software for use by the students of music was also lacking. This made the integration of ICT in the music curriculum unattainable. Most teachers (58.5%) indicated that they were not well supported by the head teachers. The study also revealed that majority of the head teachers, being stakeholders in ICT integration in school curriculum, at least understood what it means by ICT curriculum integration and its delivery. In addition, a good percentage (87.5%) indicated that they had computer skills. However some of the head teachers were rated poor by the teachers of music in providing ICT equipment and materials like computers, computer hardware and software, and technical support.

Majority of the teachers of music 46.2 percent and all head teachers were basically holders of first degree in Education. 28 teachers of music had a degree of Masters in Education. In order to improve ICT integration in music curriculum, 73.5 percent of teachers of music and 41.2 percent of head teachers emphasized on the need for teacher in-service courses in ICT. Teachers of music and head teachers also suggested for the provision of ICT equipment and facilities and electrification. Other findings are systematically indicated in section 4.7 of chapter 4, which is the summary of data analysis.

### **5.3 Conclusion of the study**

From the findings of the study several conclusions were arrived at: Given the right conditions, integration of ICT in secondary school music curriculum would provide the teachers of music with opportunities to improve professionally through in-service courses of ICT. These teachers of music and head teachers would then transform education and then help students acquire confidence and pleasure in new technologies by being familiar with ICT applications. Students need to be encouraged to take computer subject to equip them with knowledge and skills of problem-solving, information gathering and interpretations to be able to compete globally.

Teachers of music and head teachers' positive attitude toward ICT integration could reckon the provision of ICT infrastructure, facilities and equipment which could enable the realization of effective integration. Other ICT media devices besides computers and internet play a great role in increasing

teachers' opportunities to bring illustrative material into the classroom. This would increase the extent of ICT integration in music curriculum.

There is no one factor or determinant that can be exclusively attributed to the integration of ICT in music curriculum. The factors were interrelated. Teachers of music and head teachers as the key implementers of ICT in music curriculum advocated for teachers in-service courses on ICT integration, equipping schools with power, building computer laboratories and government sponsorship as major factors of the integration of ICT in secondary music curriculum.

Information and communication technologies offer veritable tool for ensuring the success of the educational reform programmes of the Kenyan Government. The value of ICT is globally recognized. However, there is a big gap in ICT skills between average Kenyan student and teaching staff and students and teaching staff of comparable economies around the world which is similar to Nigeria and other developing countries (Aniebonam, 2007). The government and individuals need to address this technology gap so that Kenyan citizens can compare globally with others. It is clear that Kenya, as a nation, and Kenyans, as citizens, are never in want of policy, but always go short of policy implementation. The potentials for information and communication technologies should be exploited to ensure the success of educational reforms.

For the integration of ICT in the music curriculum to be realized, there was need for the study to provide recommendations. The section indicates the

researcher's firm appreciation of the study. The section in addition provides researcher's sufficient thought to the study implications in relation to the literature review. The following were the recommendations of the study.

#### **5.4 Recommendations of the study**

Basing on the already stated findings and conclusions, the study recommended the following:

Most of the available options for the effective use of ICT in support of education are much more powerful when the activity is linked in a communication network that permits Internet access for email, administrative communication, file transfer and web site browsing. The Ministry of Information in collaboration with the Ministry of Education should enhance connectivity at a subsidized rate to all educational institutions. There are several potential approaches for leveraging the advantages that an extensive WiMax network could offer to the MoE's goal of bringing all secondary schools online. Public secondary schools could be equipped with adequate ICT facilities and resources to encourage the integration of ICT in teaching and learning. The government (GoK) could collaborate with Computer for Schools Kenya (CFSK), NEPAD and other legalized Development Partners (DP) to equip the schools with computers and other ICT media educational devices.

Ministry of Education, through Kenya Institute of Curriculum Development (KICD) could prepare educational-contents, such as teaching-learning objects, to

use them in learning-teaching process. Teachers could be informed/reminded for efficient use of such availabilities. Novelties could be introduced to both students and teachers and teachers could be encouraged and supported to use and also prepare ICT-based content. Teachers don't have enough time to prepare ICT-based teaching materials and make internet search at their schools. To overcome this barrier, teachers could be provided with computer and broadband internet connection packages at affordable payment and installment conditions. So, teachers will have opportunity to use technology at their homes.

Content development is a critical area that is too often overlooked. The bulk of existing ICT-based educational material is likely to be of little relevance to education in developing countries especially at the secondary levels. The Kenya Institute of Curriculum Development need to develop original educational content for example, radio programs, interactive multimedia learning materials on CD-ROM or DVD, and Web-based courses. These are tasks for which content development specialists such as instructional designers, scriptwriters, audio and video production specialists, programmers, multimedia course authors, and web-developers are needed. Like technical support specialists, content developers are highly skilled professionals and are not employed by secondary schools. The Ministry of Education could employ at least two content developers and school formator teachers in atleast each county to assist teachers when they encounter a problem during use of ICT tools since technical support is the responsibility of content developers and school formator teachers. Formator-teachers and content

developers play an important role in ICT integration into education. Thus Ministry of Education could make legal arrangement on this problem.

The Ministry of Education could invest into upgrading computer laboratories and building ICT capacity at the Teacher Training Colleges (TTCs) an intervention which can quickly yield high returns. By providing adequate access to ICTs, the TTCs can use ICTs to achieve learning objectives at various levels. At the simplest level ICTs allow for storage and display of information.

However, using ICTs also fosters exploration of materials and ideas. The TTCs should aim to have networked desktop computers for lecturers and networked computer labs for students. This option presents integration models which will foster the thoughtful use of ICTs by teacher educators and students. Large-scale ICT capacity building workshops for in-service teacher training should build off existing structures that deliver quality ongoing professional development for teachers. The program should be consistent with the workshops for lecturers and pre-service teachers at teacher training colleges. Instructional goals and activities should be highly conceptualised to address educational outcomes and teachers' realities. Introduction to computers should discuss the constraints and opportunities of using ICTs for education. Activities should focus on increasing efficiency in the teacher's workload and integrating ICTs to improve teaching and learning objectives. The distance learning material developed under the School Based Teacher Development (SbTD) program and

any new materials developed for the School Empowerment Program could be put on CDROM and on a website to be available to all teachers with computer access at any time.

Leadership plays a key role in ICT integration in education. Many teacher- or student-initiated ICT projects have been undermined by lack of support from above. For ICT integration programs to be effective and sustainable, the MoE officials together with head teachers must be competent in the use of the technology, and they must have a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education. School leadership could articulate a personal belief in the value of ICT in learning, demonstrate vision, offer role models and make clear the need for innovation. They could provide practical benefits, encourage collaboration and reflection.

Schools could encourage support services. Non-governmental organizations could sponsor counties in order to embark on their training workshops for integration of ICT in the music curriculum. The Ministry of Education could be encouraged to supply all recent materials regarding curriculum integration in schools. Schools need to be substantially reorganized. The role of parents in education could be adjusted.

### **5.5 Suggestions for Further Research**

The following are the suggested areas for further research:

i. **The impact of ICT integration on teaching and learning.**

This area could be researched on because with the growth of internet from a mainly closed academic network to a common feature, many people's lives are driven by a number of factors which affect education, for instance, the communication opportunity offered by email, audio and video conferencing which in turn have a major impact on teaching and learning.

ii. **ICT mobile laboratories**

The initiative of ICT mobile laboratories in stimulating demand for ICT integration in both public and private secondary school music curriculum in rural areas. This area could make people begin to understand that there other, faster and cheaper ways of doing things by computer and therefore, create demand.

## REFERENCE

- Apple Computer. (2005). *Changing the Conversation about Teaching, Learning, and Technology*.
- Ball, K. (2006) *Plugged in: A case study of an exemplary technology using teacher*.
- Bansavich, J. (2005) *Factors influencing pre-service teachers' readiness to integrate technology into their instruction*.
- Borg, W. R. & Gall, M. D. (1989). *Education Research: An Introduction*. 4th ed. New York: Longman
- Bowyer, D.(2000) *A new approach to computer-assisted instruction in music theory for elementary and middle school children*.
- Chuang, W. (2000) *Formative research on the refinement of Web-based instructional design and development guidance systems for teaching music fundamentals at the pre-college level*.
- Clausen, J. (2005) *Integration of technology into the instructional practice of new teachers: Case studies of beginning teachers' use of technology*.
- Dobbe, K. (1998) *A study of varied uses of interactive and presentation software programs in a music fundamentals course for non-majors*.
- Frankel, J. (2003) *Spotlight on Technology in the Music Classroom*. Reston, VA: MENC: The National Association for Music Education.
- Glenn, S. (2000) *The effects of a situated approach to musical performance education on student achievement: Practicing with an artificially intelligent computer accompanist*.
- Goedde, A. (2006) *Factors predicting preservice teacher technology competency*.
- Hadley, M. & Sheingold, K. (1993) Commonalities and Distinctive Patters in Teachers' Integration of Computers. *American Journal of Education*, 101, 261-315.

- Keengwe, J.(2006) *Faculty integration of computer technology into instruction and students' perceptions of computer use to improve their learning.*
- Kendall, N. (2006) *Teacher background and acceptability of the Internet as a resource for addressing student learning styles.*
- Klamik, L. (2005) *Creating a product to increase internal motivation to use technology in the classroom.*
- Kuhn, W., & Allvin, R. (1967) Computer-Assisted Teaching: A new approach to research in music. *Bulletin: Council for Research in Music Education, 11*, 1-13.
- Lauro, D. (2005) *An analysis of teacher perceptions of staff development for technology integration.*
- Liaw, S., Huang, H., & Chen, G. (2007). Surveying instructor and learner attitudes toward E-learning. *Computers & Education, 49*(4), 1066- 1080.
- Lincoln, H. (1969) The Computer and Music Research: Prospects and problems. *Bulletin: Council for Research in Music Education, 18*, 1-9.
- Loverro, I. (2006) *Toward a pedagogy of educational technology for teacher education programs.*
- McConnell, T. (2006) *Using collaborative reflection to build technology integration skills among preservice elementary science teachers.*
- Meltzer, S. (2006) *An analysis of professional development in technology for elementary school teachers.*
- Moulton, S. (2005) *A longitudinal study: The effect of a multimedia-training program on teacher attitude and willingness to integrate technology into classroom instruction.*
- Mugenda, O. & Mugenda, A. (1999). *Research Methods: Qualitative and Quantitative Approaches.* Nairobi: Acts Press.
- Orodho J. A. (2002). *Techniques of Writing Research Proposals and Reports in Education and Social Sciences.* Nairobi: Masola Publishers

- Peters, G. (1992) Music Software and Emerging Technology. *Music Educators Journal*, 79(3), 22-25+63.
- Pontiff, E. & Keating, A. (Eds.). (2003). *Spotlight on Technology in the Music Classroom*. Reston, VA: MENC: The National Association for Music Education.
- Reel, T. (2006) *Integration of technology into the curriculum*.
- Republic of Kenya, (2005). *Sessional Paper No. 1 of 2005 on a Policy Framework for Education, Training and Research*. Nairobi: Government Printer.
- Rogers, L. (2007) *Reassessing teacher technology integration: A casestudy*.
- Ross, E. & Johnson, T. (2001). *Technology integration and innovative teaching practices: A staff development model for facilitating change*.
- Scalisi, R. (2005) *The impact of staff development on middle school technology integration*.
- Scot, T. (2005) *Conditions, processes and consequences of technology integration: Policy to practice*.
- Smith, D. (2006) *Analysis of factors contributing to teachers' acquisition and use of technology*.
- Therrien, M. (1997) *Guidelines for the instructional design of technological and cooperative applications in a music program*.
- Webster, P., (2002) Historical Perspectives on Technology and Music. *Music Educators Journal*, 89, 38-43, 54.
- Weyhrich, S. (2001) *Apple II History*. Retrieved June 18, 2006, from <http://www.apple2history.org>.
- Zhao, Y., & Frank, K., (2003) Factors Affecting Technology Uses in Schools: An Ecological Perspective. *American Educational Research Journal*, 40(4), 807-840.

## **APPENDICES**

### **APPENDIX A**

#### **LETTER OF INTRODUCTION**

University of Nairobi,  
School of Education,  
Department of Education,  
Administration and Planning,  
P. O Box 30197,  
NAIROBI

To All Head teachers,

Nairobi County Secondary Schools

**RE: RESEARCH PROPOSAL ON THE FACTORS THAT INFLUENCE  
ICT INTEGRATION IN MUSIC CURRICULUM IN NAIROBI COUNTY,  
KENYA**

I am a Master of Education student at the University of Nairobi carrying out a study on factors that influence ICT integration in music curriculum in Nairobi County, Kenya.

I seek your assistance to administer the attached questionnaire to be filled. The responses will be used for the purpose of this study. Your assistance is highly appreciated.

Yours faithfully,

Stephen N Mbithi

**APPENDIX B**

**INTERVIEW GUIDE FOR HEADTEACHERS**

Research on the factors influencing integration of ICT in music curriculum in secondary schools in Nairobi County, Kenya.

1. How many years of teaching experience do you have? -----

2. What is the highest academic qualification?

Diploma  PGDE  BED  MED

3. What category is your school? Private  Public

4. Have you received ICT training either in school related programs or privately? -----

5. What major technology does your school promote among the learners?

-----

-----4.

How many teachers have been in-serviced on ICT integration?

-----

-----

5. Has the INSET benefited music teachers?

-----

-----

6. In your view, which kind of training does music teachers need to integrate ICT in their music classroom?

-----

-----

7. What technological teaching and learning resources are available in your school for teaching music?

---

8. What is the teachers' perception of the importance of ICT integration in music?

-----  
-----

9. Do you have music lessons allocated time in the computer lab?

-----

10. How many periods are allocated for music lessons in the computer lab?

-----  
-----

11. Do you check the music schemes, lesson plans and records of work regarding music regularly?

-----  
-----

12. What are your challenges and suggestions in ICT integration in the music curriculum?

-----  
-----  
-----  
-----

## APPENDIX C

### QUESTIONNAIRE FOR TEACHERS

This questionnaire is an attempt to find ways of integrating ICT in music. Please complete the following sections. Tick ( ✓ ) where appropriate.

#### Section A: Demographic data

1. Gender:      Male -----                      Female -----
  
2. Your current age: -----
  
3. How many years of teaching experience do you have? -----
  
4. What is the highest academic qualification?  
Diploma       PGDE       BED       MED
  
5. What type of class do you currently teach?  
                                                                    
Instrumental                      Music theory                      Music history                      Music appreciation

**SECTION B: Availability of ICTs Physical Facilities**

**For each of the following items, select Very Adequate (VA), Adequate (A) or Inadequate (IA).**

6. Computers for the purpose of music education are sufficiently available.

(i) VA

(ii) A

(iii) IA

7. Computer laboratories with appropriate music hardware for use at school are available.

(i) VA

(ii) A

(iii) IA

8. Electrification for computers with appropriate cabling is available at school.

(i) VA

(ii) A

(iii) IA

9. There are adequate projectors for use in the music classroom.

(i) VA

(ii) A

(iii) IA

**SECTION C: Availability of ICTs Teaching and Learning Resources**

**For each of the following items, select Very Adequate (VA), Adequate (A) or Inadequate (IA).**

10. Computers with music software for the purpose of music education are sufficiently available.

(i) VA

(ii) A

(iii) IA

11. ICT music textbooks with appropriate music activities for use at school are available.

(i) VA

(ii) A

(iii) IA

12. I-boards for computers with appropriate music worksheets are available at school.

(i) VA

(ii) A

(iii) IA

**SECTION D: School Leadership**

**For each of the following items, select Very Adequate (VA), Adequate (A) or Inadequate (IA).**

13. Using of technology in learning of music is supported by the school head.

(i) VA                      (ii) A                      (iii) IA

14. The head teacher makes visits in my classroom.

(i) VA                      (ii) A                      (iii) IA

15. The Board of Governors recognizes the use music technology.

(i) VA                      (ii) A                      (iii) IA

16. The head teacher solves problems related to technology.

(i) VA                      (ii) A                      (iii) IA

17. Does your head teacher possess the required basic skill in ICT?

---

**SECTION E: In-service Training in ICT**

18. What packages of technology-based professional development have you received?

-----

19. Was technology integrated into any of your teacher training courses?

-----  
-----  
-----

23.

How do you use music technology in your classroom?

-----  
-----

24. How do you think technology should be used in the teaching and learning of music?

-----  
-----  
-----  
-----

25. What suggestions or possible measures would you like to give for improvement of ICT integration in the music curriculum?

-----  
-----  
-----  
-----

**APPENDIX D**

**QUESTIONNAIRE FOR STUDENTS**

Class.....Age.....

This questionnaire is an attempt to find ways of integrating ICT in music. Please complete the following sections. Tick ( ✓ ) where appropriate.

**Section A: Music technology awareness**

1. Have you ever heard of music technology?

Yes  No

2 Which day is music taught in the computer lab?\_\_\_\_\_

3. Which other music class is taught instead of music technology?  
\_\_\_\_\_

4.

	<b>SD</b>	<b>D</b>	<b>N</b>	<b>A</b>	<b>SA</b>
Is music technology beneficial?					
Music technology influences my life					
Do the methodologies motivate?					

SD= Strongly Disagree      D= Disagree      N= Neutral      A= Agree

SA= Strongly Agree

5. How many music lessons do you have in the computer lab in a week?

Once  Twice  Rarely

**Section B: Integration of ICT in the music classroom**

You are kindly requested to respond to the following questions.

6. Does the music teacher use a computer while teaching?

Yes  No

7. Are there enough ICT student resource materials for music technology?

Yes  No

8. Does the music teacher encourage the use of computers?

Yes  No

9. Is the teacher well prepared while conducting music technology lessons?

Sometimes  Always

10. The computers have the needed software for learning.

Yes  No

12. Is the software relevant to the music technology content?

Yes  No

11. Are parents involved in the use of music technology?

Sometimes  Never

## APPENDIX E

### CALCULATIONS OF COEFFICIENT RELIABILITY OF INSTRUMENTS

#### Teachers of Music Questionnaire Reliability

Participant	x	y	x <sup>2</sup>	y <sup>2</sup>	x y
1	32	31	1024	961	992
2	31	33	961	1089	1023
3	33	33	1089	1089	1089
4	20	20	400	400	400
5	19	14	361	196	266
6	20	23	400	529	450
7	23	23	529	529	529
8	24	21	441	441	504
N=8	$\Sigma x=202$	$\Sigma y=198$	$\Sigma x^2=5340$	$\Sigma y^2=5234$	$\Sigma xy=5263$

$$r = \frac{5263 - (202)(198)/8}{\sqrt{[5340 - (202)^2/8][5234 - (198)^2/8]}}$$

$$r = \frac{263.5}{\sqrt{239.5 \times 33.5}} = \frac{263.5}{15.48 \times 18.26} = \frac{263.5}{282.59}$$

$$r = 0.93$$

Adjusted for test length using Spearman Brown Prophecy formula:

$$r = \frac{2r}{1+r} = \frac{2 \times 0.93}{1+0.93} = \frac{1.86}{1.93}$$

$$= 0.9637 \approx 0.9$$

### Students of Music Questionnaire Reliability

Participant	x	y	x <sup>2</sup>	y <sup>2</sup>	x y
1	31	31	961	961	961
2	34	33	1156	1089	1122
3	33	34	1089	1156	1122
4	22	21	484	441	462
5	20	14	400	196	280
6	19	22	361	484	418
7	23	21	529	441	483
8	23	20	529	400	460
9	19	18	361	324	342
10	33	30	1089	900	990
11	33	28	1089	784	924
12	25	26	625	676	650

13	25	29	625	841	725
14	23	25	529	625	575
15	32	31	1024	961	992
16	30	30	900	900	900
N=16	$\Sigma x=425$	$\Sigma y=413$	$\Sigma x^2=11751$	$\Sigma y^2=11179$	$\Sigma xy=11406$

$$r = \frac{11406 - (425)(413)/16}{\sqrt{[11751 - (425)^2/16] \times [11179 - (413)^2/16]}}$$

$$r = \frac{435.7}{\sqrt{462 \times 518.4}} = \frac{435.7}{21.5 \times 22.8} = \frac{435.7}{490.2}$$

$$r = 0.9$$

Adjusted for test length using Spearman Brown Prophecy formula:

$$r = \frac{2r}{1+r} = \frac{2 \times 0.9}{1+0.9} = \frac{1.8}{1.9}$$

$$= 0.90$$

Given that the positive co-efficient reliability ranges from 0 to 1, the reliability value of 0.90 and 0.99 are significant and therefore, the instruments were considered reliable.

## APPENDIX F

### RESEARCH AUTHORIZATION

REPUBLIC OF KENYA



#### NATIONAL COUNCIL FOR SCIENCE AND TECHNOLOGY

Telephone: 254-020-2213471, 2241349, 254-020-2673550  
Mobile: 0713 788 787, 0735 404 245  
Fax: 254-020-2213215  
When replying please quote  
secretary@ncst.go.ke

P.O. Box 30629-01003  
NAIROBI, KENYA  
Website: www.ncst.go.ke

Our Ref: **NCST/RCD/13/013/61**

Date: **10<sup>th</sup> June 2013**

Stephen Mbithi Nzive  
University of Nairobi  
P.O Box 92-0902  
Kikuyu.

#### RE: RESEARCH AUTHORIZATION

Following your application dated **30<sup>th</sup> May, 2013** for authority to carry out research on "*Factors influencing integration of information and communications technology in music curriculum in secondary schools in Nairobi County, Kenya.*" I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for a period ending **31<sup>st</sup> July, 2013.**

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

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

**DR. M. K. RUGUTT, PhD, HSC.**  
**DEPUTY COUNCIL SECRETARY**

Copy to:  
The County Commissioner  
The County Director of Education  
Nairobi County.



*"The National Council for Science and Technology is Committed to the Promotion of Science and Technology for National Development".*

**APPENDIX G**

**RESEARCH CLEARANCE PERMIT**

**PAGE 2** **PAGE 3**

**Research Permit No. NCST/RCD/13/013/61**  
**Date of Issue 10<sup>th</sup> June, 2013**  
**Fee received KSH. 1000**


**THIS IS TO CERTIFY THAT:**  
**Prof./Dr./Mr./Mrs./Miss/Institution**  
**Stephen Mbithi Nzive**  
**of (Address) University of Nairobi**  
**P.O Box 92-0902, Kikuyu.**  
**has been permitted to conduct research in**

**Location**  
**District**  
**County**

**Nairobi**

**on the topic: Factors influencing integration**  
**of information and communications technology**  
**in music curriculum in secondary schools in**  
**Nairobi County, Kenya.**

**for a period ending: 31<sup>st</sup> July, 2013.**



*[Signature]*  
**Applicant's**  
**Signature**

*[Signature]*  
**For Secretary**  
**National Council for**  
**Science & Technology**