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Computer Assisted Instructions As A Strategy In The Management Of Technology-Driven Change In Secondary Institutions In Githunguri District, Kiambu County, Kenya *By* Dr. Collins Omondi Ogogo , e-mail: Collins.ogogo@mksu.ac.ke and PiusKiong'o. Mount Kenya University. **October,** 2020.

ABSTRACT

This study sought to explore how computer assisted instructions (CAI) may be used as a strategy to Manage Technology-Driven Change ***(TDC)*** *in Secondary Institutions. The study sought to fulfill the following objectives;*

i. To assess the effects of Computer Based Instructions ***{CBI}*** *in Managing School Practices in Secondary Schools,*

ii To establish the extent to which Computer Assisted Instructions ***(CAI)*** *are utilized in the Management of Teaching' Practices,*

iii. To examine the relationship between Computer ~Assisted Instructions (CAI) and Academic Performance,

iv. To assess the general strategies of enhancing Instructional Delivery through Computer Based Instructions ***{CBI}****,*

v. To examine the link between Computer Assisted Instructions (CAI) and Students' Attitude towards various subjects,

vi. To assess the effects of Technology-Driven Change Management ***{TDC}*** *in the usage of Computer Assisted Instructions* ***(CAI).***

The study was guided by Keller's, (1999) Theory of Motivational Design of Instruction. This Theory has four components: thus, ***attention, relevance, confidence*** *and* ***satisfaction.***

Related literature has been reviewed on, ***organizations' strategies, computer assisted instructions in organizations, management theory*** *and* ***organization theory,*** *theoretical foundations of change management, management and management of change, technology-driven organizational change, technological change in an organization and agents of change.*

Descriptive research survey was used in this research.. Target population comprised of 30 Public Secondary Schools in Githunguri District. .Piloting was conducted on Two homogeneous Secondary Schools. These Institutions did not form part of the study, hence, were used for the purposes of validation of the Research Instruments only..A sample size of Six Schools with 6 Head-Teachers ***{HT}****, 6 Computer Teachers, 6 Store-Keepers, 6 Bursars, 6 Librarians and 120 Students were randomly and purposively sampled for the study. The final sample size of 156 respondents were studied. Questionnaires, interview guide and observation schedule were used as tools for data collection. Data were analyzed using Statistical Package for Social Sciences Version 21* ***(SPSS).*** *Qualitative data were analyzed thematically based on the type of research questions. The findings were presented in bar graphs, tables of frequency distributions and percentages. The study concluded that the use of computer assisted instructions enhanced efficiency in managing Technology-Driven Change (TDC) in secondary schools. Majority of teachers used CAI in the preparation and analysis of examination results. The study recommended that the Ministry of*

Education should encourage schools to embrace the use of CAI in school departments so as to enhance efficiency in managing technology-driven change (TDC).

1.1 Background Information to the Study

The National and International Communities have been placing great emphasis on the use of Information Communication Technology **(ICT)** as a strategy in improving Instructional Delivery **{ID}** in the educational sector. Some schools in Githunguri District, Kiambu County are unable to access quality (ICT) services due to lack of power, (ICT) facilities and qualified manpower.

In Githunguri, many schools with ICT facilities have not fully maximized the use of the same facilities to achieve desired organizational change by use of computer assisted instructions. Technology-driven change management in institutions can be enhanced and promoted by use of computer assisted instructions in several areas notably in the use of school resources like library services, stores management, financial management, management of school disciplinary issues, management of student and teachers' records, instructional delivery, exams analysis and report-card generation, preparation and adjustment of various school timetables among others. In this context, it was assumed that the use of computer assisted instructions can facilitate technology-driven change management. This was quite eminent in other institutions outside Kenya which have adopted the use of such instructions.

At a glance, the overall structure and management of performing schools with a history of admirable performance indicate an effective and efficient use of (ICT) services. The use of computer applications in Githunguri District secondary schools has not been passionately embraced in a majority of schools hence achievement and management of institutional change has been at a snail's speed. Essentially , IT was entrenched and entrusted with a strong and powerful tool for change which is technology. With such a tool, managers and leaders can institute a positive change in our schools. For this to succeed, school managerial personnel and entire school community members need to passionately embrace the change agent attitude and hence not lock the school out of the ivory towers of technological change.

Institutional change can either be technological, academic performance, financial management, school programmes change, stores management change, instructional change, and testing management change etc. Adoption and use of computer assisted instructions in many institutions as a strategy for technology-driven change management appears to be a nightmare in Githunguri District, Kiambu County.. This research attempted to explore possible interventions by use of computer assisted instructions in achieving technology-driven change in secondary institutions in Githunguri.

1.2 Statement of the Problem

As a result of poor adoption mechanisms and attitude towards computer-assisted instructions, change management in several aspects of school organization and managerial procedures have been poor in many schools in Githunguri District. This has culminated into dismal academic performance, time wastage, extra unnecessary costs and strenuous academic procedures. There is a deep need for a positive change in the cultural aspects of schools, financial management, school store procedures, general school timetables, management of school testing procedures, disciplinary matters and overall school records.

Many schools in the district have not adequately embraced computer-assisted instructions so as to effectively and efficiently manage change in institutional procedures. This perturbing scenario desperately calls for remedial mechanisms and interventional strategies. In the wake of such alarming trend, the researcher sought to analyze computer assisted instructions as a strategy in managing technology-driven change in secondary schools in Githunguri District of Kiambu County.

1.3 Purpose of the Study

The purpose of the study was to explore how computer-assisted instructions can be used as a strategy to manage technology-driven change in secondary institutions.

1.4 Objectives

i. To establish the availability of computers for teaching and learning and their role in improving academic performance in schools.
ii. To establish the extent to which computer assisted instructions are utilized by teachers in secondary schools in Githunguri District.
iii. To assess the general strategies of enhancing instructional delivery through computer-based instructions in secondary schools.
iv. To examine the link between computer-assisted instructions and students' attitude towards various subjects in secondary schools in Githunguri District.
v. To establish the level of use of computers in performing school managerial tasks.
vi. To assess the effects of computer-based instructions on managing school practices in secondary schools in Githunguri District.

1.5 Research Questions

i. How many school computers do you have and what is their role in improving academic performance?

ii. How often are computer-assisted instructions utilized in the management of teachers' practices in school?
iii. Which are the general strategies of enhancing instructional delivery through computer-based instructions in secondary schools?
iv. What is the use link between computer-assisted instructions and students' attitude towards various subjects in secondary schools?
v. How often do you use computer instructions to manage departmental duties and tasks?
vi. What are the effects of computer-assisted instructions in managing school practices?

1.7 Limitations

i. The data were collected from secondary schools with computers. For a more comprehensive report, all schools could have been studied but it was not possible due to lack of the relevant facilities and other logistics involved.
ii. The researcher intended to use observation as one of the instruments of which to a great extent does not truly reflect the feelings and thinking of respondents.
iii. Other factors affecting technology-driven change management were ignored and the researcher intended to focus on the role played by computer based instructions as a strategy in managing change in secondary institutions in the study district.

1.8 Significance of the Study

The study significantly provided:

i. Educational planners with appropriate recommendations on intervention measures.
ii. The findings of the study provide great importance to secondary education stakeholders in the region covered so as to adjust their attitudes towards computer assisted instructions as a critical tool for change management.
iii. The findings of the study created awareness to non-governmental organizations in provision of assistance to secondary schools to acquire ICT facilities for secondary schools.
iv. School management boards were able to know the right computer applications to purchase to effect efficient change management in relevant school departments.
v. The study was an eye opener for teachers and students in secondary schools in providing awareness of the computer-assisted instructions which facilitate teaching and learning in school.

vi. The study assisted school principals to embrace ICT use in their schools in effecting comprehensive change management in organizational culture.

vii. The findings benefited to the MOE in adopting relevant strategies for change management in other institutions in the country.

From theoretical point of view, the study added value to the exposure and promotion of knowledge in computer-generated instructions as a powerful tool for achievement of fruitful organizational management change and become a point of reference for other future scholars. In the same regard, the study created an urge for further scholarly research in the sphere of ICT change management.

1.9 Theoretical Framework

The study was based on Keller's, (1997) Theory of Motivational Design of Instruction. The theory holds that the expectancy-value theory motivates people to engage in the activities in which they perceive there is a positive expectancy to be successful and if their activities are linked to individual satisfaction and needs. In its original form, the two categories-expectancy and value-were expanded to interest, relevance, expectancy and outcomes. This theory includes four components: attention, relevance, confidence and satisfaction as presented by Keller, (1997) in a study conducted on motivation.

Keller's, (1997) theory was applied to the study because one of the objectives of organizational operations is to achieve better quality and performance. When institutions achieve quality performance and productivity in line with their mission and vision goals, it acts as a remarkable motivational factor to the subjects working in such institutions. Gradually, such improved performance in motivates all the institutional community members to engage in activities that drive the organization towards excellence. In this regard, the institutional members would achieve increased confidence and work satisfaction. This study assessed computer assisted instructions as a strategy in managing technology-driven change in secondary schools which act as a motivating factor in achieving better performance and quality productivity.

1.91 Conceptual Framework

This study determined the role of Computer-Assisted Instructions (CAI) in managing organizational change in secondary schools of Githunguri District. The relationship between dependent variable such as organizational change management and the independent variables which were computer-assisted instructions entrenched in school finances, library services, stores procedures, records management, preparation of school timetables, instructional deliver, testing

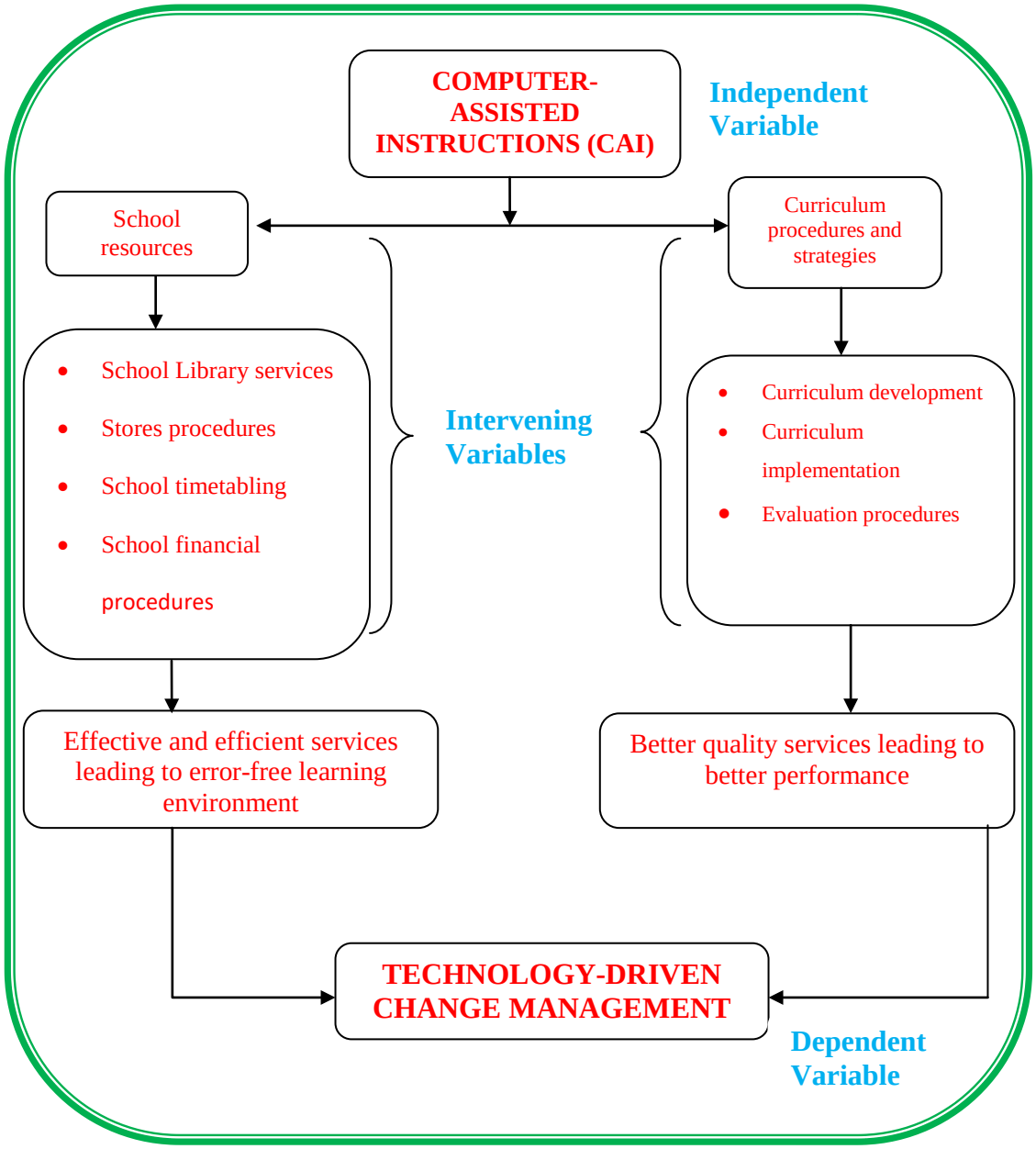
and evaluation, internal and external communication were investigated. The independent variables that influenced secondary school technology-driven change management that were analyzed included;

a) CAI use in school library services
b) CAI use in school stores procedures
c) CAI use in curriculum development and implementation
d) CAI use in school financial procedures
e) CAI use in school timetabling procedures

The Conceptual Framework has been appended below. In yhe Fig.1.1

Figure 1.1

: Interactive Role of Computer Assisted Instructions (CAI)



Source: **Researcher, (2013)**

The Conceptual Framework shows the relationship between the Independent Variable (Computer-Assisted Instructions) entrenched in various school resource processes and how their interaction and careful use resulted into a well-managed technological change. The study conceptualized that when a Manager of a given institution utilizes the powerful technological tool for change by use of Computer Assisted Instructions **{CAI}**, then, Positive Change Management {PCM} depends on the organization. Consequently, when a healthy and conducive institutional environment is

provided, then, Independent Variables positively interact with the Dependent Variable towards organizational efficiency. This, effectively results in terms of services, quality performance, improved curriculum development, better curriculum implementation and quality evaluation, among other benefits.

Intervening variables were various school resources which included school library services, stores procedures, financial management procedures, school timetabling procedures, curriculum procedures, examination management procedures and strategies. It was therefore established that once a conducive Learning Environment becomes interactive and manipulative, then a positive technology-driven change management may be achieved. By considering the above school procedures, an investigation qas conducted to determine the role of Computer Assisted Instructions in Institutional Change Management in Githunguri District.

LITERATURE REVIEW

2.0 Introduction

This chapter reviews literature related to the study under the following sub-headings; agents of change, technological change in an organization, management of change, management and organization theory, computer-assisted instruction in organizations, organization strategies and gaps identified.

2.1 Agents of Change

Mitullah, (2001) states that Information Communication Technology (ICT) facilitates creation of a dynamic base in communication capacity and suggests that to ensure a more accommodative system of entrenching and utilizing computer-assisted instructions in institutions, quality performance in the school system is vital. He further states that all institutions should create and develop policies to acquire and utilize computer-assisted instructions within their departments so as to ensure technology-driven change. Hodge, (1988) conducted a study on change management and stated that change generated within the macro environment of an organization is exogenous change while change generated from within the organization itself was endogenous. Arora, (2009) also conducted as study on change management and concluded that change is an alternation in the existing field of forces which tend to affect the equilibrium.

Arora, (2009) suggests that basic reasons for change include the multiplication of technological innovations, an increase in the cost of basic resources, competition, increase in IT, environmental awareness, consumer protection and an increase in economic interdependence of the institution. The study also emphasizes that for change to remain competitive, adoption of more effective and

efficient technology was necessary so as to harmonize with the environment. Another key notable feature in Arora's study is that organizations resist change because they desire stability and predictability. Another study conducted by Bergeron (2003), indicate how best to harness change and use its consequences for the benefit of the organization. The study categorizes change into evolutionary and revolutionary changes. According to Bergeron, (2003) evolutionary revolutionary changes are gradual, dramatic and broadly focused. Managers hence continually face choices about how best to respond to the forces for change and can adopt any of these two categories of change. The study concludes that change is something that presses us out of our comfort zone and a change agent lives in the future and not the present. This is fuelled by it that inspires passion in others. Identification of the problem suggests what kinds of solutions might be appropriate. One must also have an idea of what kinds with what tools are available to produce the institutional changes that solve the problem. Rodriguez, (1997) notes that, "for any organization to survive, quality in products and services will be a prerequisite".

Unfortunately, institutional complex problems involve producing a chair or a table. Institutional arrangements are designed to fashion predictable patterns of behaviour using a quirky sort of material were: human beings. Human beings think, have their own preferences and are capable of working out strategies to attain their ends. Their actions do not follow a predetermined pattern. Institutional reformers cannot expect to produce a definitive design; more appropriately, the population proposes solutions to be tested and further adapted as the community experiments with different options to find out which are best suited to its needs. As conditions and resource availability change, institutional arrangements continue to evolve.

2.2 Technological Change in an Organization

Stephen, (1987) conducted a study on technological change in an organization and asserts that an organization is a consciously coordinated social entity, with a relatively identifiable boundary, that functions on a relatively continuous basis to achieve a common goal or set of goals. The study contends that organizations are established, grow, mature and die just like all biological and social systems. Organization's lifecycle entails a series of five major stages; birth, growth, maturity, deterioration and death. Passing through each of these stages consists of change. Stephen, (1989) further maintains that organization theory refers to the discipline that studies the structure and design of organizations. It refers to both the descriptive and prescriptive aspects of the discipline. It describes how organizations are actually structured and offers suggestions on how they can be constructed to improve their effectiveness. He further states that managing organizational change,

efforts need to be planned, proactive and purposeful. The goal of planned change keeps the organization current and viable.

The study further indicates that organizations are treated as open systems which depend on their environment. Due to the fact that environment was not static, organizations must devise internal strategies to facilitate planned change. The researcher was more interested in changing authority patterns, access to information, allocation of rewards, technology etc. behavioural change considerations have been ignored but not to diminish their significance. Organizational change and development is a complex process that can only be presented in a simplified model. Often the change is a response of the organization to extend the growth and stability periods of its lifecycle. Managers are advised to encourage these external and internal changes best suited for the organization. Rodgers, (2000a) in his study on change management suggests five steps in the process of implementing change which include:

i. Precise definition of the operational changes that are needed.
ii. Definition of how the new working methods would affect particular people and groups.
iii. Identification of how the new attitudes and perspectives currently held by employees and how these support current working practices.
iv. Statement of the attitudes and perspectives necessary to enable people to adapt successfully to new environments and working methods.
v. Implementation of measures designed to change existing attitudes.

In this study, four strategic alternatives were available which alter technologies by introducing new equipment, methods, materials and systems, altering structures, altering tasks and altering the people. Hodge, (1988) suggests change occurs when the force favouring a particular innovation becomes stronger than the opposing force, change occurs where an individual, group or organization recognizes a problem and succeed in finding a solution and change occurs through the borrowing of ideas and practice from people of other societies and cultures. The same research also outlines the process of organizational change consisting of unfreezing which involves making an individual aware that the present behaviour is inappropriate. It involves recognizing the driving forces and increasing it. It also consists of moving or changing. This may involve building new patterns of behaviour, perceptions and feelings.

Implementing change involves three strategies of paramount importance which include the top down strategy, the bottom-up strategy and finally, the contingency strategy. Notably, some

organizations get one or more senior managers specifically responsible for the identification of problem areas requiring change and for its implementation. Such people monitor external events and assess their implications for existing administrative structures. Other methods for handling change include; creation of a financial reserve to protect employees from adverse consequences of unforeseen change. Gareth, (1999) in his study on contemporary management illustrates the Lewin's force-field organization's theory of change. The theory emphasizes that a wide variety of forces push organizations towards change and a wide variety of forces that make organizations resistant to change. Duening, (2003) conducted a study on change and perceives technological change as a planned in any given machinery or equipment in order to accomplish organizational goals. This includes any application of new ways of transforming resources into products or services. This concept can be expanded to include use of new techniques and machines.

Technological changes are continually occurring in organizations largely because of the potential of high technology to lower production costs, to boost productivity, improve quality and efficiency. Some observers believe that sometimes technological change disappoints due to the management's neglect of the structural and behavioural changes that must accompany technological changes. Such neglects were certainly costly and have adverse effects on the organization. Gareth, (1999) asserts that in any organization, the key challenge facing a manager is to continually update and improve the use of advancing IT to increase organizational performance.

Gareth, (1999) further asserts that a management information system (MIS) is specific that IT managers select and generate detailed information they need to perform their roles effectively. There have been rapid advances in the power of IT through powerful and sophisticated hardware and software which have a critical impact on organizations and managers. They further note that some of the key impacts of advancing information technology on organizations include improved organizational efficiency and effectiveness, improved quality production, reduced costs, flattens organizational hierarchy (greater decentralization), easier flow of horizontal information via video conferencing and easier sharing of knowledge and expertise between workers. In summative form, modern IT as an indispensable is central to the operation of most organizations. By giving mangers high quality, timely and relevant complete information, properly implemented IT can improve the manager's ability to coordinate and control the operations of an organization to make effective decisions. In any case, IT can help organizations attain a competitive advantage through its beneficial impact on productivity, quality, innovations, and responsiveness to customers.

2.4 Technology-Driven Organizational Change

A study conducted by Woodward (2001) examined unit, mass, and continuous technologies. The study asserts that plenty of organization technology linkages suffer from setbacks and are almost always treated as an independent variables rather than as a dependent or interactive one. This study slightly varies with another research conducted by Bennett, (1997) which claims that change tends to encourage decentralization of administrative procedures. Less delegation is given to junior managers while senior managers exercise much tighter personal control. Lynne, (2004) conducted a research which provides useful insights in her *Journal of Information Technology* on techno-change management (for technology-driven organizational change). Using IT in ways that can trigger major organizational changes creates high-risk, potentially high-reward, situations that I call techno-change (for technology-driven organizational change).

The research conducted by Lynne, (2004) provides more insights that techno-change differs from typical IT projects and from typical organizational change programmes and therefore, requires a different approach. One major risk in techno-change is that people will not use information technology and related work practices. Organizational change management approaches are also generally not effective on their own, because they do not use the IT "solutions" developed by a technical team. Consequently, when the potential for the IT "solution" is misaligned with important organizational characteristics, such as culture or incentives the IT project management and organizational change approaches can not produce the best results, for two reasons. First, the additive approach does not effectively address the many failure-threatening problems that can arise over the lengthy sequential process of the typical techno-change lifecycle. Second, the additive approach is not structured to produce the characteristics of a good techno-change solution: a complete intervention consisting of IT and complementary organizational changes, an implementable solution with minimal misfits of the existing organization, an organization primed to appropriate the potential benefits of the techno-change solution. With hard work and care, the combined IT project management plus organizational change approach can be made to work. However, an iterative, incremental approach to implementing techno-change can be a better strategy in many situations. The essential characteristic of the techno-change prototyping approach is that each phase involves both new IT functionality and related organizational changes, such as redesigned business processes, new performance metrics, and training. Pepela, (2004) in a study on change management emphasizes that a good computer system may fail to achieve the desired objectives without a good set of procedures in place to be followed by all users. Furthermore,

another study on management information technology resources conducted by Andy, (2008) stresses that organizations can either adopt the centralized or the decentralized management as each has its own merits and demerits depending on the nature of the organization. However, in cases where technology use in organizations is misdirected, Eisenberg, (2004) confirms that there are good reasons to fear the misusage and abusage of these powerful technologies. Moral and legal challenges to technology are already underway throughout the world.

Szilagyi (1990), notes that, organizational change and development efforts are typically associated with a variety of goals and terminologies. Some of the more common goals are increased performance, improved motivation, increased cooperation, clearer communication, reduced absenteeism and turnover, minimized conflict and reduced costs. There appears to be a disagreement between researchers and managers about how organizational change can be studied. Some suggest that the term organizational development describes the process of managing change. Managers engaged in managing change utilize many of the techniques, models, and approaches originally proposed by organizational development experts. Organizational change and development can be introduced in a number of ways. Some of the approaches emphasize what is to be changed, while others stress the process of change. A common conception of what approaches managers can use include structural, technological, task, and popular approaches to change. In examining common characteristics associated with change, managers should be prepared for unilateral consequence which implies that they can analyze change or be overwhelmed by changes. The following are common characteristics associated with change. Plan (structured or unstructured). The process of change can either be planned or unplanned in advance. Power (unilateral to delegate) relationships and tempo (speed and depth of the process). Pressure for change in organizations can emanate from internal or external sources. Critical models used by change agents are mainly four; the medical model, the doctor-patient model, the engineering model and the process model.

Major reasons why people resist organizational change basically include fear of economic loss, potential social disruptions, inconvenience, fear of uncertainties and resistance from groups. This view by Scholtes, (1998), claims that resistance to change in an organization includes fear of the new, loss of autonomy, fear of incompetence and fatigue. Scholtes further advises that the manager's fundamental strategies for overcoming resistance to change in organizations include education and communication, participation and involvement, facilitation and support, negotiation

and agreement, manipulation and cooptation and finally explicit and implicit coercion. Unless anticipated organizational goals are clarified, the selection of the proper approach, techniques and depth of intervention should be subjectively based. Organizational change and development efforts focus on an organization's ability to adapt environmental changes and modifications of employees' behaviour patterns. One conceptual approach to change is to consider the interrelatedness of structural, technological, and popular change. The change in any of these areas is most often accompanied by changes in the other two. For most change and development efforts, attention must be paid to transfer of learning. A macro perspective of change emphasizes diagnosis, the establishment of goals, decision-making, evaluation, and feedback. Eight stages must be systematically followed before organizational change and development effort can be declared a success. The model basically the scientific method applied to change development. Finally, managers need to embrace the scientific evaluation of organizational change and development efforts. Evaluation can create disruption within an organization, but the cost of little or no evaluation is too great to omit this crucial stage in our model. Only after proper evaluation, can the organizational change and development effort be considered a success.

Webber, (1980) asserts that in changing organizational behaviour, a change agent/manager can concentrate either on modifying the structure so behaviour is changed or focus directly on influencing people's attitudes and behaviour. As pertains to interventions for change in organization, the internet literature clarifies that the term intervention refers to all the planned programmatic activities aimed at bringing changes in an organization. These changes are intended to ensure improvement in the functioning of the organization in its efficiencies and effectiveness. The changes are brought through the employees in the organization while consultants facilitate the change process. Any organizational development (OD) intervention, therefore, involves close interaction between the consultants and the client organization. Intervention basically refers to an intended activity to bring change in the organization and the consequent activities within the organization. The intervention can be brought by an external consultant who acts in consultation with the client members. A member within the organization, acting as the in-house consultant can also make the intervention. The organization itself could plan the intervention without employing either an internal or external consultant. Where a consultant was employed, any intervention was a collaborative activity between the client and the consultant. An intervention can take place at the task, process, and system levels and their interface or at any hierarchy levels of an organization.

Aquilano, (2003) in a study on organizational technology claims that managers should also recognize the need for new technology-driven infrastructures to be compatible with all of the organization's functional elements so that information can be quickly and efficiently transmitted and shared with a minimum of errors. Chasem, (1999) maintains that most quality programmes fail because they have system without passion, or passion without system. To properly integrate technology in their organizations, Chasem (1999), in the same study shows that operations managers' first need to understand what technology can and cannot do. They must recognize the need for workers at all levels to be properly trained in the use of the technology and that this training is not just a no one shot deal, but rather a continuous ongoing process.

2.5 Management of Change

Bergeron, (2003) conducted a research on management of change and concluded that knowledge management was the deliberate, systematic business optimization strategy that selects, distills, stores, organizes, packages, and communicates information essential so as to improve employee performance and corporate competitiveness. In this study, change management is noted to be an approach to shifting transitioning individuals, teams, and organizations from a current state to a desired future state. It was an organizational process aimed at helping change stakeholders to accept and embrace changes in their business environment. In some project management contexts, change management refers to a project management process where changes to a project are formally introduced and approved.

Bergeron, (2003) further advised that change management was a systematic approach to dealing with change, both from the perspective of an organization and on the individual level. A somewhat ambiguous term, change management has at least three different aspects, including: adapting to change, controlling change, and effecting change. For an organization, change management means defining and implementing procedures and/or technologies to deal with changes in the business environment and to profit from changing opportunities.

Eason, (2004) articulates in his study on management that successful adaptation to change is within in an organization as it is in the natural world. Just like plants and animals, organizations and the individuals in them inevitably encounter changing conditions that they are difficult to control. The more effectively you deal with change, the more you are likely to thrive. Adaptation might involve establishing a structured methodology for responding to changes in the business environment (such as a fluctuation in the economy, or a threat from a competitor) or establishing

coping mechanisms for responding to changes in the workplace. In a computer system environment, change management refers to a systematic approach to keeping track of the details of the system. Davies, (1997) asserts that change is inevitable and some of it will be the desired results of a given project while others might be unpredictable consequences.

Drucker, (2011) in a study conducted on change management offers a vital tool for analyzing and planning the change effort. The tool kit on "Change Equation" is depicted in Figure 2.1. It was important to note for the mathematically inclined that the equation is used for illustrative purposes and cannot be quantified. The elements of the equation include; C or the desired change, F or the situation in the future (desired state or vision) as a result of the change, N or the situation now, P or the plan of how to get from the now to the future, and R or potential resistance to the change. It should be noted that the R could also be denoted as PL or perceived loss. That was, what those who will be impacted by the change effort perceive they will lose as a result of the change (power, prestige, benefits, reporting relationships, authority and responsibility. If the sum of the future minus the present was positive, and multiplied by the change plan was greater than the potential resistance, the change effort will be successful.

Figure 2.1

The Change Equation Diagnostic Tool

C=(F-N) x P>R **Change = (Future – Now) x Plan > Resistance**

Adopted from Drucker, (2011)

2.6 Theoretical Foundations of Change Management

A research conducted by Burnes, (2009) provides the main theoretical foundations of change management. He cautions that change management was not a distinct discipline with rigid and clearly defined boundaries. The theory and practice of change management draw on a number of social science disciplines and traditions. To achieve clarity and understanding of the theoretical foundations of change management without staying, there are only three schools of thought that form the central platforms on which change management theory stands.

The fundamental schools of thought include the individual perspective school, the group dynamics school and finally the open school systems. In judging the applicability of these approaches to

managing change, one should assess whether they apply to individual, group or system-wide change. Organizational change is not a linear process but a continuous, open-ended, cumulative and unpredictable process of experimentation and adaptation. Change at multi-level, cross-organizational process unfolds in an iterative and messy fashion over a period of years. The role of a manager is not to plan for change but to shape the long-term process of change.

2.7 Management Theory and Organizational Theory

William, (1988) in his study on organization relates management theory and organizational theory by asserting that management theory explains management practice and how managers behave while organizational theory is thought of as a group of related concepts, principles, and hypotheses that are used to explain the components of organizations and how they behave. Hence, for one to fully understand organizations and how they work, a general knowledge of both management theory and organizational theory must be applied. In general, organizational theory comprises ten cornerstones which are; boundary and environment, information processing and choices, adaptation and change, goals, work, organization design, size and complexity, technology, culture, power and authority. He further identifies four basic schools of thought that are used as building blocks for organizational theory which include the classical school, the behavioural school systems and the contingency theory.

The classical school concentrates on the nature of work and how it fits into building and maintaining an organizational structure. The behavioural school stresses the necessity for understanding group behaviour and the role that the group plays in organizational performance. The school systems brought a total understanding of how organizations work combining the classical and school behaviours. The contingency theorists put forth the ideal that the organizational relationship to environment is properly viewed as flexible and prescriptive rather than static. A clear understanding of how organizations function would adequately prepare those who assume managerial positions in organizations. Better quality decisions coupled with more effective implementation through better understanding of individual and group behaviour can only bring improved performance to the organization. Eason, (1998) argues that the challenge of information technology was flexible technology which transforms a given organization. Technology possesses a profound impact on organization.

Definitions of technology vary from writer to writer. Whereas some focus on machinery used in manufacturing, others focus on the knowledge used while others stress on the human-machinery interaction. For the purpose of treating organizations a broad view of technology was adopted. Technology was hence defined as the art and science employed in the production and distribution of goods and services. Organizations deal with technology available to theme in different ways. Some are innovators and actually create new technology. Others are late followers and only adopt technology after it has been used. A certain level of technology was said to exist in every society whether primitive or advanced. Sometimes adoption of this new technology conflicts with existing social and cultural values. Other times even when technology has been developed from within the society, it can be resisted. Technology has many effects in an organization and embodied by values for efficiency and innovation.

2.8 Computer-Assisted Instructions in Organizations

Derrat, (2010) in a study on Computer-Assisted Instruction (CAI) provides useful insights on CAI as instruction or remediation presented on a computer. Many educational computer programmes are available online and from computer stores and textbook companies which enhance teacher instruction in several ways. Computer programmes are interactive and can illustrate a concept through attractive animation, sound, and demonstration. They allow students to progress at their own pace and work individually or solve a problem in groups. Computers provide immediate feedback, letting students know whether their answer is correct. If the answer was not correct, the programme shows students how to correctly answer the question. Computers offer a different type of activity and a change of pace from teacher-led or group instruction.

In the same study, computer-assisted instruction improves instruction for students with disabilities because students receive immediate feedback and do not continue to practise the wrong skills. Computers capture the students' attention because the programmes are interactive and engage the students' spirit of competitiveness to increase their scores. Also, computer-assisted instruction moves at the students' pace and usually does not move ahead until they have mastered the skill. Programmes provide differentiated lessons to challenge students who are at risk, average, or gifted. An example of CAI is for writing. Computer programmes for writing help students develop ideas, organize, outline, and brainstorme.

Templates provide a framework and reduce the physical effort spent on writing so that students can pay attention to organization and content. Word processors are excellent tools for students who find handwriting tedious. Often, students with disabilities have difficulty with all the requirements for the

writing process. They have trouble organizing their thoughts and then retaining those thoughts long enough to put them on paper. Their handwriting must be neat and their spelling and grammar correct enough to convey their message, tasks that they may find difficult. But before word-processing can save time during the actual writing process, students must know how to type and how to use the computer. Typing speeds may be slower without proper instruction in typing; slower typing may lead to less quality and shorter length in writing assignments (MacArthur, 2000). If students cannot type fluently or must search for letters and numbers, the process may be slower than handwriting. Common examples of computer programmes that assist students in the writing process include word prediction, speech-to-text, text-to-speech, spell-checker and thesaurus.

Teachers should review the computer programme or the online activity or game to understand the context of the lessons and determine which ones fit the needs of their students and how they may enhance instruction. Writing programmes are beneficial to writing instruction because they allow students to learn in a variety of ways and can speed up the writing process. With proper training, students can learn to focus on the message instead of the mechanics. The use of computer assisted instructions needs to be properly integrated into an organization in order to provide a competitive advantage, in terms of both increasing the efficiency of the operations as well as increasing effectiveness.

Hollenbeck, (2005) confirms that collaborative technologies lie at the heart of recent advances in organizational structure and design. Collaborative technologies are now a reality due to the advent of web applications that enable dissimilar computers to communicate with one another, plus wireless communications protocols that allow portability and specialized software products that facilitate information sharing and collaborative modifications.

2.9 Organizations' Strategies

Bernard, (2009) asserts that the term strategy implies thoughtful planning to do something. His study identifies five main and interrelated definitions of strategy which depict strategy as a plan, strategy as a ploy, strategy as a pattern, strategy as a position and strategy as perspective. Bernard, (2009) further notes that there are three basic types or models of strategy that organizations adopt in practice which are the competitive force model, the resource-based model and the strategic conflict model. Ichy, (1989) claims in a study conducted on organizational strategies that any strategic change has its principal purpose which spells out the desired organizational state, good technical, political, and cultural alignment. Norton, (2001) claims that management is a set of

processes that can keep a complicated system of people and technology running smoothly and hence implementing new strategies requires large-scale change.

Lynda, (2007) suggests that IT enabled projects are designed to exploit emerging strategic opportunities and to both core operations and core strategies. In this regard, IT initiatives are often defined, implemented and managed at the top levels of the organization. Furthermore, IT initiatives are normally designed to reduce costs and improve performance of the core operations of the organization. Hussain, (1985) warns that top management should guard against total reliance on heavily processed data, data that filter out emotion, feeling, sentiment, mood, and all of the irrational nuances of human situations. Effective management and decision-making in organizations often depend on judgments based on the very elements that have been filtered out.

2.10 Research Gaps Identified

The following research gaps were identified:

i. Technology-driven change management by use of computer-assisted instructions in school practices had been ignored hence the need for this study.

ii. No research had been conducted in Githunguri District that strongly illustrated the utilization of computer-assisted instructions in the cultural practices of secondary schools and hence the need for this study.

iii. Studies on ICT infrastructural implementation tended to ignore the major effects of computer assisted instructions in change management in secondary schools.

iv. No study had been done to indicate need to use computer-assisted instructions as a strategy in technology-driven change management in secondary schools. This study, therefore, addressed these gaps as identified from the reviewed literature.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

Creswell, (2009) emphasizes the use of the survey design due to its economy and the rapid turnaround in data collection. Research design refers to the procedures used by the researcher to collect data, administer the instruments and analyze the data as asserted by Ogula, (2005). The survey design was preferred because it provided a numerical description of trends, attitudes and opinions of a population by studying a sample of that population (Creswell, 2009). It is from the sample results that enabled the researcher to make generalizations and other claims about the population which involved describing, recording, analyzing and reporting conditions as they currently exist without manipulating the variables, Orodho, (2005). The researcher adopted the qualitative methodology and hence used interviews which were critical in gathering facts in order to establish fundamental and beneficial information for the educational organizations. In this study, the researcher attempted to analyze statistical information about the use of computer applications to effectively manage change in schools in the locale of the study. Both questionnaires (Appendices II, III, and IV) and interview schedules (Appendix V) were used to collect data in this study. Questionnaires (Appendices II, III, and IV) were completed by the teachers, students and schoolheads from various sampled schools.

3.1.1 Location of the Study

The study area was carried out in Githunguri District in Kiambu County-Kenya. The researcher concentrated on public secondary schools in this region.

3.2 Target Population

Creswell, (2009) stressed the need to consider essential aspects of a population and the means of identifying individuals in the population. Cohen and Manion, (1995) states that the specification of the term population to which the inquiry is addressed, affects the decisions that the researcher must make about a target population. A population is regarded as a complete set of individuals, cases or objects with some common observable characteristics. A target population is considered to include all the members under study from whom the researcher would like to generalize the results of the study. In this study, 30 public secondary schools with computers in Githunguri District constituted the target population. The schools were categorized as follows:

Table 3.1:

Target Population

	Type of School	Number of Schools	Final Sample
1.	Boys	12	2
2.	Girls	14	2
3.	Mixed	04	2
4.	**Total**	30	6

Both boys and girls from different sampled schools of varying ages and diverse family backgrounds were studied. Teachers were also studied. Target population of this study comprised 30 head teachers, 30 computer teachers, 30 bursars, 30 store keepers and 300 students making a total of 420 respondents.

Table 3.2:

Sampled Group of the Study

	Head teachers	Computer Teachers	Bursars	Store Keepers	Students	Total
Total Population	30	30	30	30	300	**420**
Final Sample	6	6	6	6	120	**144**

3.3 Sampling and Sampling Techniques

The researcher used random sampling in which each individual in the population has an equal probability of being selected (Creswell, 2009). This ensured that the sample was a representative of the population (Keppel, 1991). Random sampling is a procedure in quantitative research for selecting participants. The technique was preferred by the researcher because with randomization, a representative sample from a population provides the ability to generalize the population. The random sampling of the population made it easier for the researcher to access and collect details about the research problem. It also guaranteed gender balance in the sample. A sample is considered to be a small group obtained from accessible population (Mugenda and Mugenda, 1999). Sampling entails the process of selecting a small group from the population under study to

represent the total population. Slavin, (1984) asserts that due to limitations in time, funds and energy, a study can be carried out from a carefully selected sample to represent the entire population. Borg and Gall, (1996) and Mulusa, (1988) emphasizes that a sample must represent the target population or the universe on all aspects. Gay, (1992) observes that a researcher selects a sample due to various limitations that may not allow researching the whole population. This study concentrated on a sample size of six Secondary Schools in Githunguri District to represent the entire district. In each school, only 20% of the respondents were studied. This represented a total sample of 420 respondents.

3.4 Research Instruments (Tools)

Fink, (2002), provides four forms of data collection among which the researcher chose two types. Establishing the validity of the scores in the survey helped to identify whether appropriate instrumentation prevailed in the research (Creswell, 2009). Data were collected by use of two instruments which included;

i. Questionnaires (Appendices II, III, and IV).
ii. Interview schedule (Appendix V).

A questionnaire is a device which consists of a series of items dealing with various topics to be administered to the respondents with a view to obtaining research information from them. Questionnaires on the use of Computer-Assisted Instructions in schools in various school procedures were structured. This allowed the respondents to freely choose options provided. The questionnaires (Appendices II, III, and IV) were open-ended. The use of questionnaire in this research was paramount in obtaining information from the headteachers, other teachers and students. Orodho, (2004), emphasizes the use of questionnaires and points out that a questionnaire has the ability to collect large amounts of information in reasonably quick space of time and the response can be easily analyzed. Three categories of questionnaires (Appendices II, III, and IV) were used in this study.

Headteachers Questionnaires (Appendix II)

The following were addressed by the Headteachers questionnaire:

i. Information about the school.
ii. Headteacher's opinions on computer application use in school to manage organizational change.

Questionnaires for Other Teachers (Appendices III) Addressed

i. Policies for school information technology.

ii. Information technology management in classroom teaching.
iii. Teachers' attitude and opinions on ICT strategy use in school departments.
iv. School testing and examination analysis by use of computer packages.
v. School timetabling procedures by use of computer packages.
vi. Students and teachers data management systems in school.

Students Questionnaire (Appendix IV)

The student questionnaire addressed issues on;

i. Opinions on computer use in classroom teaching.
ii. Individual or group learning procedures through internet use.
iii. Role of computer use in accomplishing class assignments and own research.

Interview Schedule for Support Staff (Appendix V)

The interviews were very beneficial in extracting in-depth information since it allowed the researcher not only to probe the respondent on the Computer-Assisted Instructions use in relevant school but also allowed the researcher to control over the line of questioning (Creswell, 2009). The participants were also able to provide historical information of particular institutions and prevailing circumstances in the use of institutional resources. An appropriate interview for the support staff mainly for those who work in the library, finance and stores departments was structured to address the impact of ICT use in their respective departments, challenges and success of applications used.

3.5 Pilot Study

Creswell, (2009), suggests that pilot testing is important to establish the content validity of an instrument and to improve questions, format, and scales. The research instruments were pretested in 2 schools of similar characteristics as the study population but the same schools were excluded from the final sample population. Pretesting was to determine clarity of questions and the comprehension by both the researcher and the respondents. Successful piloting created conducive environment for the next stage for the study which included data collection techniques.

3.6: Validity

Creswell, (2009), stresses that establishing validity of the scores in a survey helps to identify whether an instrument might be a good one to use in survey research. Validity involves the determination of whether one can draw meaningful and useful inferences from scores on the instruments. It is based on determining whether the findings are accurate from the standpoint of the researcher, the participant, or the readers of an account (Creswell & Miller, 2000). Validity

actually represents the phenomenon under investigation. To ensure qualitative validity, the researcher checked the accuracy of the findings by employing certain procedures. Creswell, (2009) observes that in qualitative validity, the researcher checks for the accuracy of the findings by employing certain procedures. Notably, there are three basic types of validity which include;

i. Content validity
ii. Predictive or concurrent validity
iii. Construct validity

In content validity, the researcher determines whether the items measure the content they were intended to measure. Orodho, (2009) insists that content validity refers to the evaluator's appraisal of what the content of the test measures. It is determined by systematically conducting a set of operations such as defining in precise terms, the specific content universe to be sampled, specifying objectives, and describing how he content universe will be sample to develop test items. A test should cover a representative sample of the content. Content validity is significant primarily in achievement testing and various tests of skills and proficiency, such as occupational skills of test. In determining content validity, the researcher seeks to verify whether the entire content area has been well-represented or covered sufficiently by the items. The researcher too seeks to ascertain whether a given content area has been adequately tested without over-testing or under-testing it. Content validity primarily deals with verification of whether or not a test or measuring instrument fully represents the area being measured. For a test to valid, it must fully cover all the intended items comprehensively.

In predictive or concurrent validity, a researcher not only determines whether scores predict a criterion measure but also whether results correlate with other results. Orodho, (2009) refers to criterion-related validity as the use of a measure in assessing subjects' behaviour in specific situations. This kind of validity concerns the empirical techniques of studying the relationship (or correlation) between test scores and some independent external measures (criteria). For example, KCSE grades are used when recruiting because it is perceived that they are predictor variables while job placement, effectiveness and performance are criterial variables. Criterion-related variables are classified into two, namely; concurrent validity and predictive validity. In predictive validity, we are concerned with the usefulness of the test scores in predicting future performance. Predictive validity thus involves using test scores to predict future behaviour and should only be used when a researcher is strongly convinced that one variable has a clear criterion measure. In

determining the concurrent validity of a test, test scores of a group of subjects are related to a criterial measure administered at the same time or within a very short interval of time.

Construct validity involves determining whether items measure hypothetical constructs or concepts. Of late, construct validity has also included whether the scores serve a useful purpose and have positive consequences when they are used in practice (Humbley & Zumbo, 1996). Construct validity occurs when investigators use adequate definitions and measures of variables. Orodho, (2009), defines construct validity as a measure of the degree to which data obtained from an instrument meaningfully and accurately reflect or represent a theoretical concept. Such an approach is used when no criterion or domain of content is generally accepted as an adequate measure of a concept. Concepts such as level of mastery of research concepts, intelligence, self-esteem, motivation cannot be directly observed as they are abstract but their effects on the behaviour of subjects or individuals can be observed.

For construct validity to be determined, there are three steps involved which include; i) A researcher identifies variables that should, on logical grounds, have a strong relationship with the variable, scale or test whose validity is to be assessed. Second, the researcher establishes, through statistical tests, the degree to which various variables (or a single variable) and the variable of interest go together i.e. co-vary. Based on step two, the researcher finally interprets what the evidence says about the construct validity of the particular variable of interest.

The researcher had sought the expert's opinion in assessing the content validity. The experts in this study included the researcher's supervisors who assessed the instruments and found them appropriate for this study. The researcher also worked with peers to ascertain validity of the instruments.

In this study, validity of the instrument was considered to measure the degree to which data obtained meaningfully and accurately reflected the theoretical concept and what was supposed to measure as Orodho, (2008) emphasizes. In this study, two principals, 4 other teachers, 4 support staff, and 10 students from the 2 schools who were not included in the final study were used to assess the relevance of the content used in the instrument. Relevant and necessary adjustments according to the findings were made appropriately.

3.6.1 Reliability

Creswell, (2009) indicates that in qualitative reliability, the researcher's approach is consistent across different researches and different projects. According to Orodho (2004), reliability of measurement is concerned with the degree to which a particular measure gives similar results over

a number of repeated trials. Orodho, (2004), defines reliability as the extent to which scores are free of measurement errors. It focuses on the degree to which empirical indicators are consistent across two or more attempts to measure theoretical concepts (Orodho, 2005). It is also defined as an agreement between two efforts to measure the same thing with the same method. Reliability is also defined as the re-reducibility of measurement stability, Lehner, (1979). According to Creswell (2008), four commonly used methods to determine reliability include;

i. Test-retest method.
ii. Equivalent form method.
iii. Split-half method.
iv. The internal consistency method.

The researcher relied on the test–retest technique in order to obtain reliability of the instruments in the study. Significant steps followed to achieve reliability included:

i. The designed questionnaires were issued to a few respondents who were excluded from the study sample.
ii. The filled up questionnaires were scored manually.
iii. After two weeks, the same questionnaires were administered to the same group.
iv. The filled up questionnaires were again scored manually.
v. A comparison of answers provided in 2 and 4 above was analyzed.

A Spearman rank order correlation was used to compute the correlation coefficient for the determination of the extent to which the contents of the questionnaires were consistent in eliciting the same responses every time the instrument was used.

3.7 Data Collection Procedures

After a successful defence of the researcher's proposal, an introduction letter from the University's School of Education (**Appendix VI**) was acquired. This was followed by a forum with the DEO Githunguri District to request for an introductory letter to the selected schools (**Appendix VII**). After acquiring the introductory letter from the DEO Githunguri District, the researcher travelled to the selected schools and sought permission to collect data from the headteachers using the relevant introductory letter (**Appendix I**). Good rapport with the headteachers was established for the intended research purpose to succeed. After obtaining permission from the respective headteachers, the researcher then distributed the questionnaires to the headteachers who were among the target population. From the headteachers, the researcher proceeded to administer questionnaires (**Appendices II, III, IV and V**) to other relevant teachers, students and support

staff. Out of 6 sampled schools, the researcher received back all questionnaires from headteachers (100% response). Teacher response was 97.0%, the response for student was 96.3% and 100% response for the interview schedule for the support staff.

3.8 Data Analysis

Creswell, (2009) observes that the process of data analysis involves making sense out of text and image data. Data analysis process involved conducting different analyses, moving deeper and deeper into understanding the data, representing the data, and making an interpretation of the larger meaning of the data. Basic qualitative analysis was used concurrently with additional qualitative strategies of inquiry as outlined by Corbin, (2007). These involve generating categories of information, selecting one of the categories and positioning it within a theoretical model, and then explicating a story from the interconnection of these categories (selective coding). Coding was used in the analysis which involved organizing the material into chunks or segments of text before bringing meaning to information (Rossman & Rallis, 1998). The researcher developed codes only on the basis of emerging information collected from participants and those provided in qualitative database by Bogdan and Biklen (1992). The use of qualitative software programme was heavily used to analyze data through the skills available (e.g., Weitzman & Miles, 1995).

The items from the questionnaires (**Appendices II, III and IV**) and interview schedule (**Appendix V**) were arranged and recorded according to the research questions and research objectives. The data were then organized, tabulated and analyzed into frequency tables, graphs and percentages. The researcher also analyzed data using descriptive statistics. The analysis of quantitative data was accomplished through the use of Statistical Package for Social Sciences (S.P.S.S.). Findings were interpreted, conclusions drawn, suggestions provided as well as recommendations of the results.

3.9 Ethical Considerations

Israel and Hay (2006), provide several ethical questions apparent today in such issues as personal disclosure, authenticity and credibility of the research report, the role of the researchers in cross-cultural contests, and issues of personal privacy through forms of internet data collection. The researcher anticipated ethical issues that arose during the study (Hesse-Bieber & Leavey, 2006). Ethical considerations were observed by the researcher during the study by putting in place adequate strategies to persuade respondents to co-operate and be assured of protection of their rights. The purpose of the study was described to the participants, Sarantakos (2005), and introduced in the cover letter for the survey research. The respondents were notified that all the

information provided was to be used for academic purposes only and treated with utmost confidentiality. The researcher also conducted himself professionally, in dignity and integrity in order to win the confidence of the respondents. Besides obtaining official permission to conduct the study, the researcher also sought permission from the participants to collect data meant for the study.

CHAPTER FOUR

ANALYSIS, PRESENTATION AND DISCUSSION OF RESULTS

4.0 Introduction

This chapter presents data presentation, data analysis and discussion of the results. The data have been discussed in frequency distributions, tables and bar graphs.

4.1 Number of Computers in the Schools and Their Role in Improving Performance

Item (i) of the research objectives required the establishment of the availability of computers for teaching and learning and their role in improving academic performance in schools. The data gathered in the table 4.1 below were based on the resources as placed on the schools and computed in terms of their availability as stated below.

Table 4.1.1: Number of computers in the schools

Number schools	Number of computers	Percentage
1	5	4.0
1	11	8.9
1	12	9.7
1	26	21.0
1	30	24.2
1	40	32.3
Total	**124**	**100.0**

The study sought to establish whether schools had enough computers for all students. Data gathered on the resources as placed on the schools and computed in terms of their availability revealed that only one school had 40 computers which reflected 32.3% with another school having 30 computers which reflected 24.2%. The table shows that the majority of the respondents had at

least 5 computers which represented 4.0%. The results therefore confirm that the number of computers found in the sampled population were few to support meaningful learning and transmission of information and technology to the respective students population varied from 1-9 and from 1 computer 13 respondents. The study hence indicated that some respondents were sharing computers/resources while studying in the various schools. The data gathered therefore revealed that there was a high number of respondents who acted significantly at the institutional related learning modes. The results have been supported by Stepheen who conducted a research on the utilization of resources (ICT in schools). The study reveals that for the beneficial integration and utilization of ICT and computers in the institutions, there has to be a need to avail sufficient facilities and resources to the learners in order to minimize wastage. Stepheen, (2008) agreed with the findings of Stepheen, (1989) and reported a great concern of resource utilization more so computer facilities in schools to be too limited that could not provide adequate learning in secondary schools.

This study further reveals that computer lessons were taught in all classes from form one to form four in the respective schools under study in Githunguri District. It also showed that computer studies subject was being examined by the Kenya National Examination Council (KNEC) at Kenya Certificate of Secondary Education (KCSE) stage. The study revealed further that the computer teachers handling the computer subject in schools were not enough and most of those available had been employed by the Board of Management (BoM) and kept on transferring in search for greener pastures. The study indicated that such a trend disrupted continuity in learning.

The study sought to establish the role played by computers in improving students' academic performance which was tested by obtaining opinions of headteachers and computer teachers on the role of computers on students' performance. Data gathered were computerized and presented in table 4.2 shown below.

Table 4.2: Ways in which use of computer in teaching improves performance

Ways of improvement	Number	Percentage
Use of visible examples	3	50.0
Stimulus variation	4	66.7
Gives teachers current knowledge	3	50.0
Allows efficiency of information flow	4	66.7

The study sought to establish the relationship between computer-assisted instructions (CAI) and school academic performance. The table showed that in 4 schools the use of computer-assisted instructions allowed efficient information flow during teaching which reflected 66.7% as compared to 3 other schools in which teachers were of the opinion that computer assisted instructions gave teachers current knowledge on the subject taught which reflected 50.0%. The table shows that the majority of the respondents held the opinion that the use of computer in teaching improved performance which represents more than 50.0% of the population. The findings confirm that the use of computer facilities in teaching had a great effect on the performance of students in the sampled institutions. The data revealed that there is a significant relationship between computer assisted instructions (CAI) and academic performance of students in the population which was under study. The results have been supported by the findings of a study conducted by Mitullah, (2001) on Information and Computer Technology (ICT) in Kenya which revealed that institutional performance can largely be improved by the support provided through the strengthening of ICT structures meant for academic improvement. The study therefore reveals that for the successful flow of information and enhancing stimulus variation during teaching, there is a significant need to provide and promote ICT infrastructure in the classroom environment. The findings are also supported by a study conducted by Eason, (1998) on information technology and organizational change which revealed that comprehensive provision of sufficient ICT related strategies need to be established for beneficial institutional and classroom performance. Data gathered on ways in which computer use creates positive change of attitude were computerized and results shown below in Table 4.3.

Table 4.3: Ways in which CAI use in teaching brings positive change of attitude

Way	Number	Percentage
Improves teaching methods	5	83.3
Learners are able to receive same information from a different source	2	33.3
Makes some rather abstract concepts look real	3	50.0
Can display visual aids that look real especially in sciences	6	100.0
Improves learner attentiveness	2	33.3
Improves learner understanding of rather difficult seeming concepts	4	66.7

The table shows that in all the 6 schools which reflected 100.0%, the opinion held by all the respondents revealed that computer-based technology displays visual aids that appeared real, particularly in science-oriented disciplines. The results hence revealed that the students were able to adjust their poor attitude towards science subjects to good attitude and hence performed better. The table further shows in 5 schools which reflects 83.5% the students were of the opinion that the use of computer technology contributed to better teaching methods which were findings supported by Webber, (1980) in a study conducted on management which revealed that instructional processes were more beneficial to the targeted learners when computer facilities wereare exploited to the maximum. Only a small percentage of sample schools (33.3%) improved learner attentiveness during learning by the use of computer-assisted instruction. The results of this study were strengthened by the findings of another study carried out by Wardken, (2001) on teaching strategies which revealed that the use of ICT in learning and teaching practically improved learner understanding to a great extent. The above study findings are further supported by Ertl, (2004) in a study on Information Technology who reported that teachers of mathematics did not take advantage of technological equipment that were available in schools so as to enhance performance. The study further claimed that indeed many instructors clung to traditional methods of teaching and made little use of computers except for reward activities or events outside the prescribed curriculum.

4.2.1 General Strategies of Enhancing Instructional Delivery Through Computer-Based Instructions

The research question item (ii) of Appendix 2 required the assessment of the general strategies utilized in instructional delivery through the use of computer-based instructions. This was tested by obtaining views of teachers on strategies used during the computer-based lessons. The data gathered availability of various software used by teachers for the purposes of classroom teaching and accomplishment of school-related tasks. The results were computerized and presented in figure. 4.1 below.

Percentage rates of use of different strategies in instructional delivery

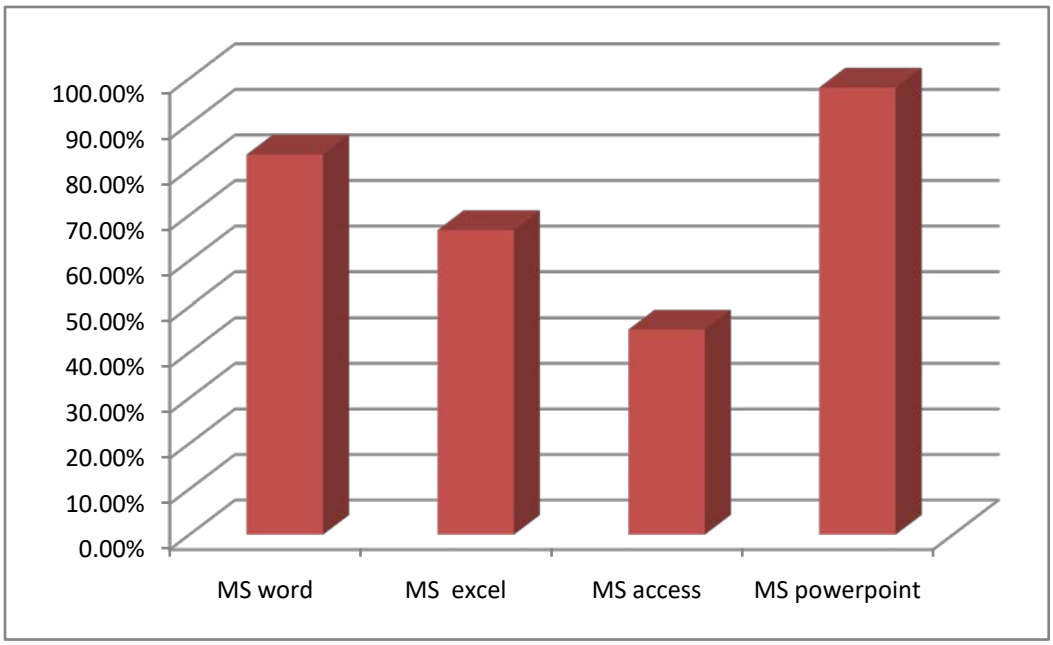


Figure 4.1:

The data sought to establish strategic instructional delivery modes utilized by instructor in the course of teaching. The table shows that the use of Ms Power point program was the most commonly used strategy to accomplish instructional delivery in the sample schools reflecting 98.0% in comparison to the Ms Access which accounted for the lowest percentage of the instructional programs used by teachers which reflected 45.0% of the threshold. The table shows that the respondents who utilized Ms Word program accounted for 83.3% while those that used Ms Excel reflected 66.7%. The results, therefore, confirm that the majority of respondents preferred to use Ms Power point as strategic instructional software suitable for instructional delivery and transmission of quality ideas, knowledge and information on a variety of disciplines for learners. The study hence reveals that majority of instructors preferred using Ms Power Point program which is easy to prepare, allows longer learner attention and easy information flow. The findings

are supported by a study carried out by Astleitner, (1995) on motivationally adaptive computer-assisted instruction whose findings revealed that a majority of successful presenters prefer to use the Ms Power Point application for the maximum level of presentation achievement for any audience. The study therefore reveals that there is a significant need to improve and enhance the use of Ms Power Point in instructional delivery in institutions through further teacher training on use such application in order to strengthen instructor- utilization of computer-based strategies for effective learning. The findings have further been supported by a study conducted by Wardken, (2001) on teaching strategies which revealed that the use of computer applications such as Ms Power Point has adverse positive achievements in a learning environment and becomes significantly beneficial in instructional delivery designed for learners.

The study therefore concludes that amongst a variety of applications used for instructional delivery, the use of Ms Power Point takes priority as it is well tailored for learner needs and presenter requirements and should therefore be promoted for use in institutions as a strategy to manage instructional change in schools.

4.3 Relationship Between CAI and Students' Attitude Towards Subjects

Item (iii) of the research questions required the examination of the link between computer-assisted instructions and students' attitude towards various subjects offered in schools. This was tested by assessing the performance of students on various subjects when computer-based instructions were utilized in the teaching of a subject. Students' performance in each cluster of subjects at Kenya National Examinations Council level were computed as shown in the Fig. 4.2 below.

Percentage effect of CAI on Subjects' performance

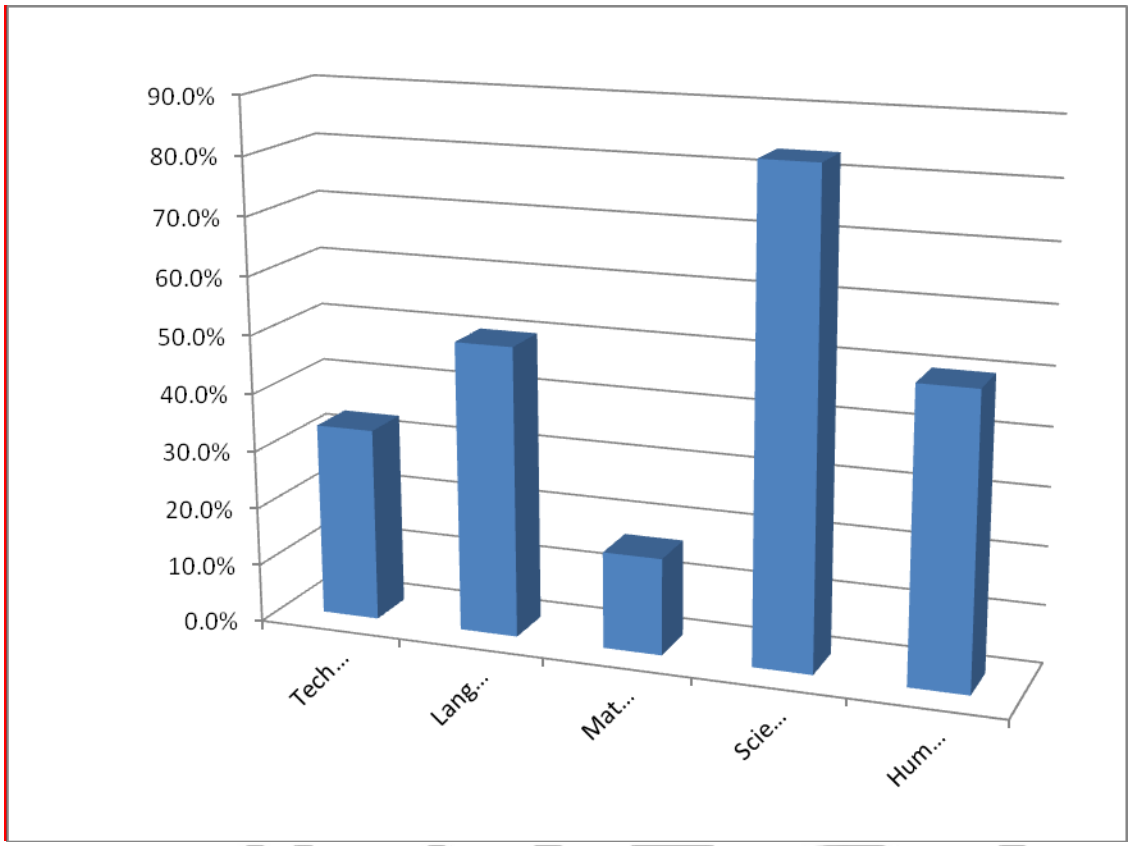


Figure 4.2:

The study sought to establish the link between computer-assisted instructions (CAI) and students' attitude towards subjects offered in schools. The table above shows that sciences were best significantly performed when computer-based instructions were used in classroom instruction which reflected 83.3% as compared to languages and humanities which reflected 50.0% of positive performance when computer instructions were used during teaching. The performance of mathematics reflected 14.0% while the performance of technical subjects accounted for 30.0%. Based on the results reflected by students' performance, the findings hence revealed that the sciences were best performed in schools where computer instructions were used during classroom teaching which indicated a positive students' attitude towards the sciences when computer facilities are utilized. The study further confirmed that the use of computer technology and internet resources made abstract scientific concepts and ideas appear simpler and easier for learner understanding. The findings are supported by a study conducted by Szilagyi, (1990) on organizational behaviour and performance which revealed that the use of computer-based instructions during teaching created a positive attitude and appreciation in students' learning exercise. The study findings are further supported by Rodriguez, (1997) in a study conducted on

information technology which revealed that computer technology use in schools has greatly created interest and a positive attitude towards acquisition of knowledge in most learners. The findings in this study confirm the need to uphold and improve the use of computer technology in instructional procedures in order to support the continued creation of a positive attitude in the learning exercise.

The study further revealed that the use of computers in instructional delivery enhances neatness in written work, promotes creativity and makes calculations easy and thereby enhancing the student's self- esteem and attitude towards a given subject. The findings on ways in which the use of computer-assisted instructions (CAI) in teaching impacts a positive attitude in students were computed and are presented in the next section below.

4.4 Application of Computer-Assisted Instructions (CAI) in Managing Technology-Driven Change

Item (iv) of the research questions required an assessment the application of computer-assisted instructions (CAI) in Managing Technology-Driven Change in various school departments. This was measured in terms of gathering the opinions of school managerial personnel on the use of computers in performing or carrying out school management duties. The data were computed and are shown in the figure 4.3 below.

Application of computers in performing school duties

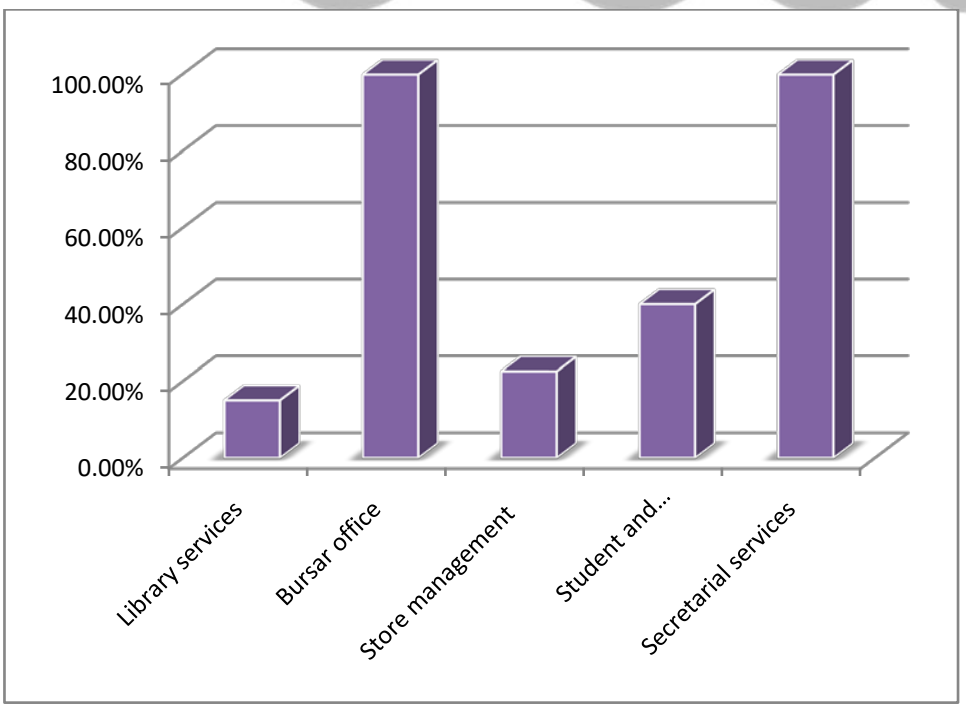


Figure 4.3:

The study sought to establish the level of use of computers in performing school managerial tasks. The figure shows that in the sample schools, the bursar's office and secretarial departments heavily relied on computers to accomplish their office tasks reflecting 99.8% as compared to the library department which reflected 15.0% which was the lowest level of computer use in schools. The store departments reflected 22.5% use of computer technology in their operations while the students and teacher data management reflected 40.0% use of computer technology. The results therefore show that only a small number of schools utilize computer technology in managing library and store managerial services. The findings hence confirm that only a few schools fully utilize computer technology in running and managing their internal procedures. The findings have been supported by a study carried out by Burnes, (2009) on managing changes which revealed that only a few institutions have fully integrated ICT use in all their departments in order to achieve the targeted organizational goals. The findings in this study are further supported by Mellon, (1999) in a study conducted on computer uses and benefits and by another study conducted by Beekman, (2003) on Information Technology use who suggested that computer-assisted instructions (CAI) can turn practice into a game and motivate employees to achieve enormous productivity in organizational practices. From the findings above, it is quite clear that computer use in the sample schools in managing school practices need to be enhanced further so as to effectively manage contemporary institutional change.

4.5 Effects of Computer Assisted Instructions (CAI) in Managing School Practices

Item (v) of the research questions required the headteachers to give their opinions on Computer Assisted Instructions (CAI) in the management of different school practices (MDSP). The items included managerial and classroom practices as viewed by the headteachers. The data gathered in Figure 4.4 below were based on the opinions of headteachers on the effects of computer-assisted instructions (CAI) in managing school practices and was computed as stated below.

Effects of computer-assisted instructions (CAI) in managing school practices

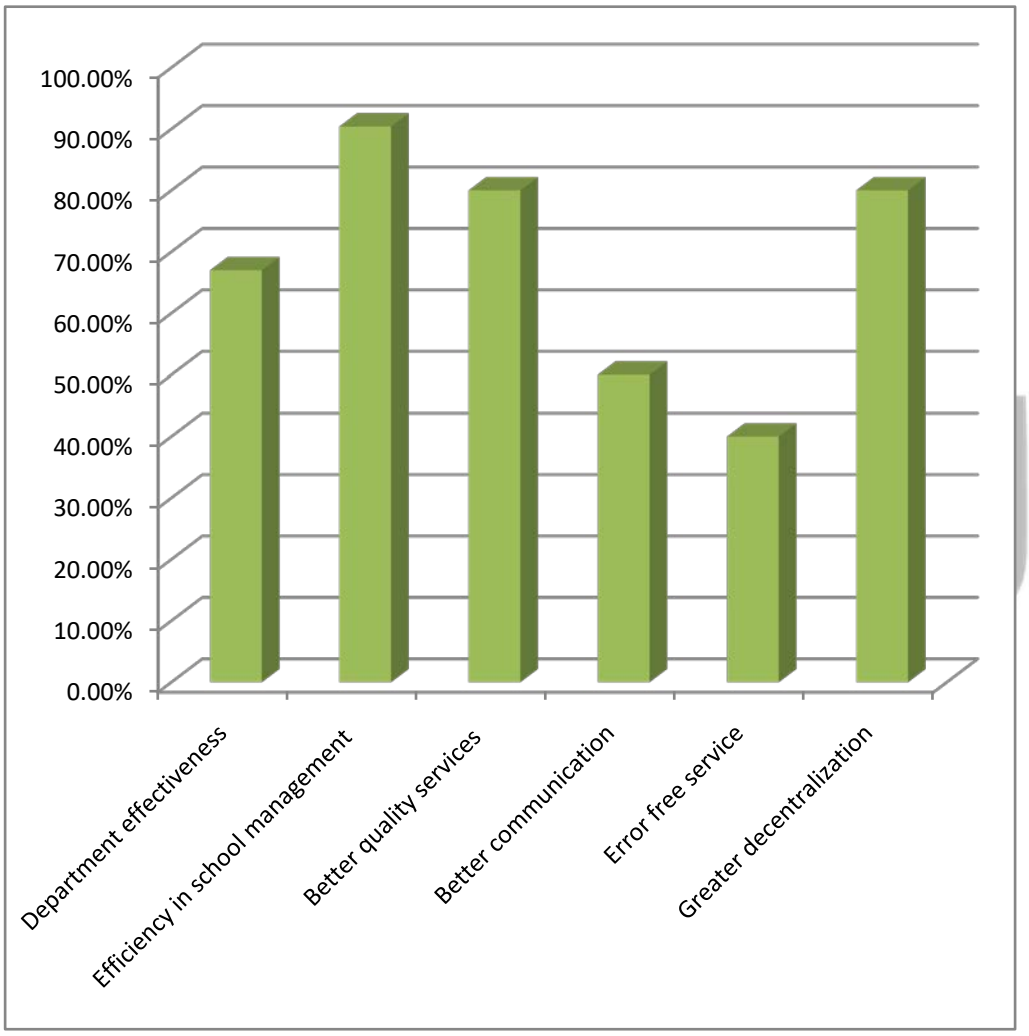


Figure 4.4:

The study revealed that the use of computer assisted-instructions (CAI) in the management of school practices were found to have a positive change and impact on the academic performance of learners. This finding was supported by a study conducted by Rodgers, (2000) who examined change on management of different school practices in the area of the study. The study revealed that several strategic alternatives in terms of change management impacted positively on the behaviour of the respondents within the organization. The data based on the strategic management

of alternatives of headteachers revealed that efficiency in the school strategic management outperformed other strategic management practices by 99% as compared to the error-free service which scored 40.0% as shown in figure 4.5. The data also revealed that managerial strategies through the use of computer- assisted instructions (CAI) in the management of school practices were effective in greater decentralization which scored 80.0%, efficiency in the school management 90.4%, better quality services 80%, departmental effectiveness 67%, better communication 50% respectively. This means that most schools under study placed more effort on strategic management services like efficiency in school management. The study further revealed that both better quality services and greater decentralization had equal ratings 80% as viewed by the respondents. This means that any institution has to put in place greater effective services in the effective strategic management of its resources. The findings were therefore supported by Rogers, (2000) who conducted a study on change management which revealed different strategic alternatives which impact positively on the behaviour of people within an organization. The findings are further supported by Duening, (2003) in a study on managing organizations in which he suggested that the use of modern technological communication provides adequate efficiency and provision of error-free services as a strategic alternative for organizations. This study therefore revealed that for organizations to operate effectively and efficiently, there is a deep need for the managerial personnel to seek sufficient support from the use of computer-assisted instructions (CAI) in their operations so as to increase organizational productivity.

4.6 Utilization of Computer Assisted Instructions (CAI) in the Management of Teacher Practices

Item (vi) of the research questions required the teachers to give their opinions on the extent to which computer-assisted instructions (CAI) are utilized by teachers in the management of their school practices. The data gathered in the sample schools were computerized and presented below in Fig. 4.5

Utilization of CAI in the management of teacher practices

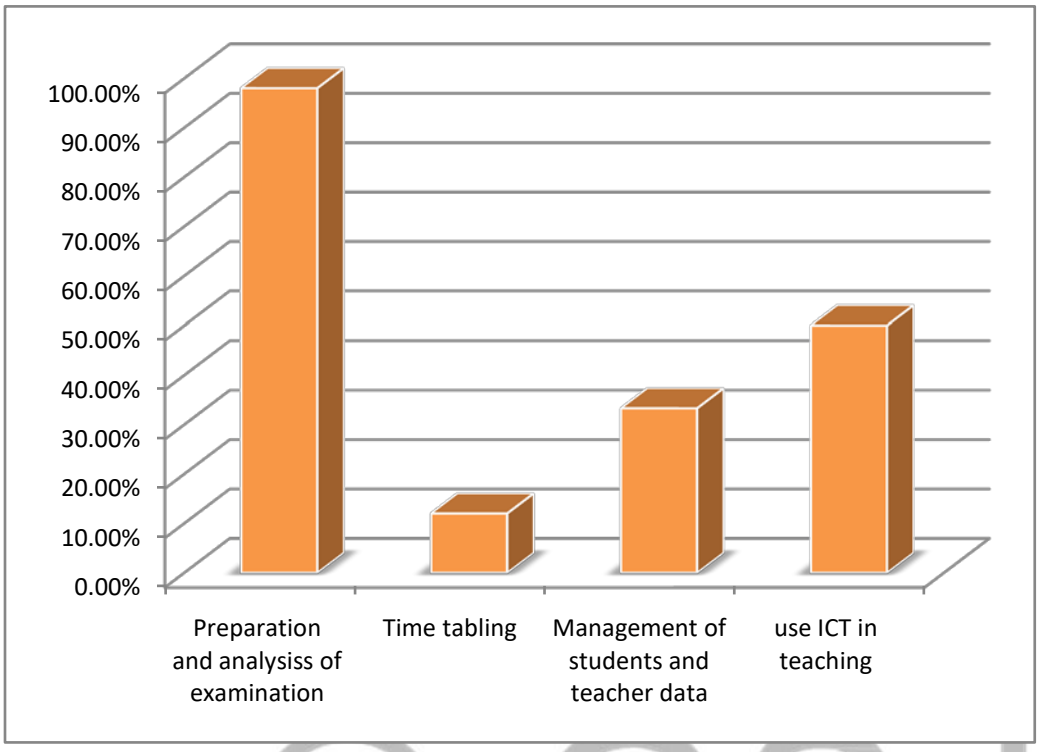


Figure 4.5:

From figure 4.5, 98.0% of the teachers in the sample schools managed their examinations during preparation and analysis of results using computer-assisted instructions (CAI) as compared to only 12.0% of teachers who used computer- assisted instructions (CAI) for timetabling. This implied that in the management of teachers' practices in the sampled schools, the timetabling practice accounted for the lowest percentage of the threshold in the management of teacher school practices while the use of computer-assisted instructions (CAI) in examination practices was rated the highest teacher school practice which accounted for 98.0% of all the practices. Use of information and computer technology (ICT) in teaching was rated second with 50.0%. This implies that teachers used Computer Assisted Instructions (CAI) in classroom instruction though not very frequently and this could be attributed to the fact that the selected sample took computer studies as a subject and that the respondents were computer teachers. Management of teachers and students data was rarely practiced with a percentage of 33.3%. The use of information and computer technology (ICT) facilities by teachers in the curriculum delivery only accounted for less than a half of the entire percentage which was rated at 45.6%. This confirms that the use of Computer facilities in the sampled schools for teaching and learning has not effectively been appreciated and is underutilized in the transmission of knowledge and information to learners as expected in schools with computers which is supported by a study conducted by Derrat, (2010) on computer-

assisted instructions as remediation that facilitates learning in the classroom environment. This study revealed that although computer technology may be utilized as a strategy for change management in modern institutions, particular barriers to use of Computer Assisted Instructions (CAI) may prevail like effective operations of hardware and software by both teachers and learners thereby hindering effective curriculum delivery through technology.

This study, therefore, confirms that the use of computer technology in the preparation of the school timetables has not yet been fully recognized and utilized in majority of institutions which reflects an underutilization of technological resources. Such findings have been supported by Hollenbeck, (2005) in a study conducted on collaborative technologies which reveals that computer use in learning institutions has not been fully utilized to effectively manage institutional managerial procedures. From this study therefore, it is clear that there is a great need for school managers to facilitate acquisition of timetabling software and enhance, encourage as well as promote the use of such technology in managing timetabling procedures so as to save time and create efficiency in school practices.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the research findings, conclusions, recommendations of the results as well as suggestions for further studies.

5.1 Summary

5.1.1 Number of Computers in the Schools and Their Role in Improving Performance

The study sought to establish the availability of computers in schools and determine their role in improving academic performance. Data gathered on the resources as placed on the schools and computed in terms of their availability in table 4.1 of chapter four revealed that only one school had 40 computers which reflected 32.3% with other 2 having 30 computers which reflected 24.2%. The table shows that the majority of the respondents had at least 5 computers which represented 4.0%. The results confirmed that the number of computers found in the sampled population were few to support meaningful learning and transmission of information and technology to the respective student population varied from 1-9 and from 1 computer 13 respondents. The study hence indicated that some respondents were sharing computers/resources while studying in the various schools. The data gathered revealed that there was a high number of respondents who acted significantly at the institutional related learning modes. The results have been supported by a

study conducted by Stepheen who conducted a research on the utilization of resources (ICT schools). The study revealed that for the beneficial integration and utilization of ICT and computers in the institutions, there has to be a need to avail sufficient facilities and resources to the learners in order to minimize wastage. Stepheen, (2008) agreed with findings of (1989) and reported a great concern of resource utilization more so computer facilities in schools to be too limited that could not provide adequate learning in secondary schools.

This study further revealed that computer lessons were taught in all classes from form one to form four in the respective schools under study in Githunguri District. It also showed that computer studies subject was being examined by the Kenya Examinations Council at Kenya Certificate of Secondary Education stage. The study revealed further that the computer teachers handling the computer subject in schools were not enough and most of those available had been employed by the Board of Management (BOM) and kept on transferring in search for greener pastures. The study indicated that such a trend disrupted continuity in learning.

5.2.1 General Strategies of Enhancing Instructional Delivery Through Computer-Based Instructions in Secondary Schools

Research questions item (ii) required the assessment of the general strategies utilized in instructional delivery through the use of computer based instructions. The data gathered indicated the extent of use and availability of various software used by teachers for the purposes of classroom teaching and accomplishment of school-related tasks. The data also showed the percentage rates of use of different strategies in instructional delivery through various modes utilized by instructors. The study revealed that the use of Ms Power point program was the most commonly used strategy to accomplish instructional delivery in the sample schools reflecting 98.0% in comparison to the Ms Access which accounted for the lowest percentage of the instructional programs used by teachers which reflected 45.0% of the threshold. The study revealed that the respondents who utilized Ms Word program accounted for 83.3% while those that used Ms Excel reflected 66.7%. The results therefore, confirmed that the majority of respondents preferred to use Ms Power point as strategic instructional software suitable for instructional delivery and transmission of quality ideas, knowledge and information on a variety of disciplines for learners.

The study further revealed that majority of instructors' preferred using Ms Power Point program which is easy to prepare, allows longer learner attention and easy information flow. The findings are supported by a study carried out by Astleitner, (1995) on motivationally adaptive computer-

assisted instructions (CAI) whose findings reveals that a majority of successful presenters/teachers prefer to use the Ms Power Point application for the maximum level of presentation achievement for any audience. The study, therefore, concludes that there is a significant need to improve and enhance the use of Ms Power Point use in instructional delivery in institutions through further teacher training in order to strengthen instructor-utilization of computer-based strategies for effective learning. The findings have further been supported by a study conducted by Wardken, (2001) on teaching strategies which reveals that the use of computer applications such as Ms Power Point has adverse positive achievements in a learning environment and becomes significantly beneficial in instructional delivery designed for learners.

The study reveals that amongst a variety of applications used for instructional delivery, the use of Ms Power Point takes priority as it is well-tailored for learner's needs and presenter requirements and should be promoted for use in institutions as a strategy to manage instructional change in schools. The study recommends further support of teacher utilization of computer resources especially the use of Ms Office applications in instructional delivery of all subjects in the school curriculum. This can be done by strengthening the structures that govern teacher training in use of the relevant applications beneficial in curriculum delivery. The study further recommends organization of various seminars, workshops, training courses for teachers for effective use of computer applications that can increase efficiency and overall institutional achievement.

5.2.2 Link Between Computer-Assisted Instructions and Students' Attitude Towards Various Subjects in Secondary Schools

The study's item (iii) of the objectives required the examination of the link between computer assisted instructions and students' attitude towards various subjects offered in schools. The study findings revealed that science-oriented subjects were best performed when computer-based instructions were used in classroom instruction which reflected 83.3% as compared to languages and humanities which reflected 50.0% of positive performance when computer instructions were used during teaching. The performance of mathematics reflected 14.0% while the performance of technical subjects accounted for 30.0%. Based on the results reflected by students' performance, the findings hence revealed that the sciences were best performed in schools where computer instructions were used during classroom teaching which indicated a positive students' attitude towards the sciences when computer facilities are utilized. The study further confirms that the use of computer technology and internet resources made abstract scientific concepts and ideas appear simpler and easier for learner understanding. The findings are supported by a study conducted by

Szilagyi, (1990) on organizational behaviour and performance which revealed that the use of computer-based instructions during teaching created a positive attitude and appreciation in students' learning exercise. The study findings are further supported by Rodrizuez, (1997) in a study conducted on information technology which revealed that computer technology use in schools has greatly created interest and a positive attitude towards acquisition of knowledge in most learners. The findings in this study confirmed the need to uphold and improve the use of computer technology in instructional procedures in order to support the continued creation of a positive attitude in the learning exercise.

The study further revealed that the use of computers in instructional delivery enhances neatness in written work, promotes creativity and makes calculations easy and thereby enhancing the student's self-esteem and attitude towards a given subject. The study findings also revealed that in all the six schools which reflected 100.0% showed that computer-based technology displays visual aids that look real particularly in the science-oriented disciplines. The results hence revealed that the students are able to adjust their poor attitude towards the science subjects to good attitude thus performing better as shown in the previous data presentation on subjects' performance. Additional findings of the study revealed that in 5 schools which reflects that 83.5% of the students were of the opinion that the use of computer technology contributed to better teaching methods which are findings supported by Webber, (1980) in a study conducted on management which revealed that instructional processes are more beneficial to the targeted learners when computer facilities are exploited to the maximum. Only a small percentage of sample schools 33.3% improved learner attentiveness during learning by the use of computer-assisted instruction.

The results of this study were strengthened by the findings of another study carried out by Wardken, (2001) on teaching strategies which revealed that the use of information and computer technology (ICT) in learning and teaching practically improved learner understanding to a great extent. The above study findings are further supported by Ertl, (2004) in a study on information technology who reported that teachers of mathematics do not usually take advantage of technological equipment that is available in schools so as to enhance performance. The study further revealed that many instructors still cling to traditional methods of teaching and make little use of computers except for reward activities or events outside the prescribed curriculum. From the findings and conclusions of this study, it is recommended that the Githunguri District institutional managerial personnel strengthen the avenues for training teachers to use computer resources during instructional delivery and thus help in changing students' attitude towards

subjects perceived as difficult to understand. The study further suggests that more District's professional and financial investments be made in terms of computer resource use in classroom teaching and learning.

5.2.3 Effects of Technology-Driven Change in the Usage of Computer Assisted Instructions (CAI)

Item (iv) of the objectives required an assessment of the application of computer assisted instructions (CAI) in managing technology-driven change in various school departments. This was measured in terms of gathering the opinions of school managerial personnel on the use of computers in performing or carrying out school management duties. This was tested by determining the level of computers use in performing school managerial tasks. The findings revealed that in the sampled schools, the bursar's office and secretarial departments heavily relied on computers to accomplish their office tasks reflecting 99.8% as compared to the library department which reflected 15.0% which was the lowest level of computer use in schools. The store departments reflected 22.5% use of computer technology in their operations while the students and teacher data management reflected 40.0% use of computer technology.

The results showed that only a small number of schools utilized computer technology in managing library and store managerial services. The findings hence confirm that only a few schools fully utilize computer technology in running and managing their internal procedures. The findings have been supported by a study carried out by Burnes, (2009) on Managing Change which reveal that only a few institutions have fully integrated Information and Computer Technology (ICT) use in all their departments in order to achieve the targeted organizational goals. The findings in this study are further supported by Mellon, (1999) in a study conducted on computer use and benefits and by another study conducted by Beekman, (2003) on information technology use who suggested that CAI can turn practice into a game and motivate employees to achieve enormous productivity in organizational practices. The study concludes that computer use in the sampled schools in managing school practices has been underutilized which has lowered effectiveness, achievement and overall performance. The study recommends training of all institutional support staff in the use of computer resources. The study further recommends the use of computer resources in all school departments for increased beneficial results quantitatively and qualitatively.

5.2.4 The Effects of Computer-Assisted Instructions in Managing School Practices

Item (v) of the objectives required the determination of the effects of computer assisted instructions in managing school practices. From the data gathered and presented in table 4.5 in chapter four on the effects of computer-assisted instructions (CAI) on management of school practices (MSP) the study revealed that there was a positive change and impact on the academic performance of learners. This finding was supported by a study conducted by Hodge, (1988) who examined technological change and suggested that change occurs when the force favouring a particular innovation becomes stronger than the opposing force. The findings by Hodge, (1988) have also been supported by Gareth, (1999) in his study on implementing change management which revealed that instructional change impacted positively on the behaviour of the respondents within an organization. The study revealed that the strategic management styles used by headteachers outperformed other strategic management practices by 99.0% as compared to the error-free service which reflected 40.0% as shown in figure 4.1 of chapter four. The gathered data also revealed that managerial strategies through the use of computer-assisted instructions (CAI) in the management of school practices were effective in greater decentralization which scored 80.0%, efficiency in the school management 90.4%, better quality services 80%, departmental effectiveness 67.0%, and better communication 50.0% respectively. This means that most schools under study placed more effort on strategic management services like efficiency in school management. His study further revealed that both better quality services and greater decentralization had equal ratings 80.0% as viewed by the respondents. This means that any institution has to put in place greater effective services in the effective strategic management of its resources. The findings are supported by Rogers, (2000) who conducted a study on change management which revealed different strategic alternatives which impact positively on the behaviour of people within an organization. The findings are further supported by Duening, (2003) in a study on managing organizations in which he suggests that the use of modern technological communication provides adequate efficiency and provision of error-free services as a strategic alternative for organizations.

This study concludes that for organizations to operate effectively and efficiently, there is need for the managerial personnel to seek sufficient support from the use of computer-assisted instructions in their operations so as to increase organizational productivity. From the findings and conclusions of this study, it is, therefore, significant to recommend to the schools in Githunguri District to

embrace the use of computer-assisted instructions (CAI) in all their departments so as to enhance efficiency in managing technology-driven change. The study further concludes that the use of computer-assisted instructions (CAI) in institutions not only facilitates and promotes better quality services but also the realization of an error-free service environment. Better communication within an organization and greater efficiency in public schools are also realized as revealed by the findings of the gathered data which are presented in figure 4.3. The researcher hence recommends to the School Boards of Management of Githunguri District to enhance and facilitate the use of computer-assisted instructions in all the learning institutions so as to access the benefits associated with such technology as revealed by this study. For this to effectively take place in the entire district, the researcher equally suggests the additional training of the school departmental personnel in order to ensure maintenance of high standard of achievement and productivity in schools pertaining to the use of computer resources.

5.2.5 Utilization of Computer-Assisted Instructions in the Management of Teachers' Practices

Item (vi) of the research objectives required the teachers to give their opinions on the extent to which Computer-Assisted Instructions are utilized by teachers in the management of their school practices. From the data gathered in the sample schools and presented in figure 4.6, 98.0% of the teachers in the sample schools managed their examinations during preparation and analysis of results using computer-assisted instructions as compared to only 12.0% of teachers who used computer-assisted instructions (CAI) for timetabling. This implied that in the management of teachers' practices in the sampled schools, the timetabling practice accounted for the lowest percentage of the threshold in the management of teacher school practices while the use of computer-assisted instructions (CAI) in examination practices was rated the highest teacher school practice which accounted for 98.0% of all the practices. One of the reasons for low percentage of teachers using Computer Assisted Instructions (CAI) for timetabling is that the respondents may not be directly charged with the responsibility of preparing the school timetable in the sample schools as that was a duty lying within another docket.

Use of Information and Computer Technology (ICT) in teaching was rated second with 50.0%. This implies that teachers used CAI in classroom instruction though not very frequently and this could be attributed to the fact that the selected sample took computer studies as a subject and that the respondents were computer teachers. Management of teachers and students data was rarely practiced with a percentage of 33.3%. The use of ICT facilities by teachers in the curriculum

delivery only accounted for less than a half of the entire percentage which was rated at 45.6%. This confirms that the use of computer facilities in the sampled schools for teaching and learning had not effectively been appreciated and have been underutilized in the transmission of knowledge and information to learners as would be expected in schools with computers which is supported by a study conducted by Derrat, (2010) on computer-assisted instructions as remediation that facilitates learning in the classroom environment. This study revealed that although computer technology may be utilized as a strategy for change management in modern institutions, particular barriers to the use of CAI may prevail like effective operations of hardware and software by both teachers and learners thereby hindering effective curriculum delivery through technology.

This study confirmed that the use of computer technology in the preparation of the school timetables has not yet been fully recognized and utilized in a majority of institutions which reflects an underutilization of technological resources. Such findings have been supported by Hollenbeck, (2005) in a study conducted on collaborative technologies which reveals that computer use in learning institutions has not been fully utilized to effectively manage institutional managerial. This study revealed that there is a great need for school managers to facilitate acquisition of timetabling software and enhance, encourage as well as promote the use of such technology in managing timetabling procedures so as to save time and create efficiency in school practices. Similar findings have been reported and supported by Aquilano, (2003) in a study on computer facilities use in organizations. He asserts that plenty organizational benefits can be realized in the utilization of computer technology which includes the time saving aspect. From the findings of this study, the researcher concludes that most samples schools have not fully utilized the computer resources in the management of teacher practises. The researcher recommended that institutions be supplied with modern computers for use in managing teacher practices and where possible furnish each teacher with a computer for the purpose of enhancing efficiency.

The findings of this study further revealed that the use of examination software in most institutions has also not been fully maximized the preparation and analysis one reason or the other which reflects underutilization of Information Technology(IT) resources in the school monitoring and evaluation procedures. This study concludes that this need not be the case when the schools affected have the capacity to acquire the required computer resources and use them for additional achievement and performance. This study suggested that a policy be formulated and put in place to facilitate the procurement and utilization of relevant software for effective handling of testing and evaluation of the school curriculum. The researcher further recommends the training of teachers in

the use and handling of the curriculum evaluation software by the software developers. The researcher also recommends that appropriate procedures be put in pipeline in order to make such software affordable to most institutions especially the young and upcoming institutions.

5.3 Conclusions

Based on the above research findings, the following conclusions were made:

i. Computer facilities/resources were insufficient for learners
ii. Most of the computer teachers kept transferring to schools with better remuneration.
iii. Some of the computer facilities were of low standards and generally poor in handling some computer applications meant for learning.
iv. Some schools lacked sufficient funds to procure modern computer facilities/resources for adequate and effective learning.
v. There is need for relevant authorities to mobilize funds to be able to procure adequate computer resources for schools.
vi. In most schools, the number of learners were too many for the available computers and resources thus creating a strong need for provision of additional computer-related resources.

5.4 Recommendations

From the findings and conclusions, the following recommendations were made:

i. The government should employ more computer teachers in schools as most of teachers handling computer studies in schools were employed by Board of Managements and kept transferring to other schools in search of greener pastures therefore disrupting learning process.
ii. The government should provide more funds to schools to ensure there are enough computer facilities to support meaningful and beneficial classroom technology adequate for teaching and learning.
iii. The School Boards of Managements (BOM) should identify the individual school Information and Computer Technology (ICT) needs and involve all the relevant stakeholders in order to raise adequate funds for the procurement of computer related facilities and resources for each school.

iv. The Schools' Board of Managements (BOM) should also source for funds from non-governmental organizations (NGOs), private and public donors to ensure sufficiency in required funds to acquire enough computer resources for schools.

Data gathered and computerized on the relationship between computer-assisted instructions and academic performance revealed that in four schools, the use of computer-assisted instructions allowed efficient information flow during teaching which reflected 66.7% as compared to 3 other schools in which teachers were of the opinion that computer assisted instructions gave teachers current knowledge on the subject taught which reflected 50.0%. Majority of the respondents held the opinion that the use of computer in teaching improved performance which represents more than 50.0% of the population. The findings confirmed that the use of computer facilities in teaching had a great effect on the performance of students in the sampled institutions. The data therefore, revealed that there is a significant relationship between computer-assisted instructions (CAI) and academic performance of students in the population which was under study. The results have been supported by the findings of a study conducted by Mitullah, (2001) on information and computer technology (ICT) in Kenya which reveals that institutional performance can largely be improved by the support provided through the strengthening of information and computer technology (ICT) structures meant for academic improvement. The study, therefore, concluded that for the successful flow of information and enhancing stimulus variation during teaching, there is a significant need to provide and promote information and computer technology (ICT) infrastructure in the classroom environment. The findings are also supported by a study conducted by Eason, (1998) on information technology and organizational change which revealed that comprehensive provision of sufficient information and computer technology (ICT) related strategies need to be established for beneficial institutional and classroom performance. The study hence recommends the strengthening and provision of computer-assisted instructions (CAI) in institutions by the relevant authority so as to support and facilitate better academic achievement which shall be a key drive in the achievement of Vision 2030.

5.4.1 Summary and Conclusions of the Study

From the above discussions, the following were fundamental conclusions concerning the use of computer-assisted instructions (CAI) as a strategy of managing technology-driven change in secondary schools.

i. The use of computer-assisted instructions enhanced efficiency in managing technology-driven change in secondary schools.

ii. Majority of teachers used computer-assisted instructions (CAI) in the preparation and analysis of examination results.

iii. The findings revealed that use of computer-assisted instructions (CAI) in teaching improved the performance of learners in all subjects taught in secondary schools and more so the science-oriented subjects.

iv. Common strategies of enhancing instructional delivery through computer-based instructions in secondary schools include use of power-point, Ms-Word, Ms-Excel, and Ms-Access.

v. Generally, the use of computer-assisted instructions (CAI) had a positive change on the attitude of students towards the subjects taught in secondary schools.

vi. The use of computer-assisted instructions (CAI) led to school management effectiveness which reflected (100.0%), provision of better quality services (85.7%), greater decentralization (85.7%), departmental effectiveness (71.4%), better communication (57.1%) and provision of error-free services (42.9%).

5.4.2 Recommendations of the Results

From the study, the following recommendations were vital towards improving the use of computer-assisted instructions (CAI) in secondary schools while managing technology-driven change.

i. Schools should be encouraged to embrace the use of computer-assisted instructions (CAI) in school departments so as to enhance efficiency in managing technology-driven change.

ii. All secondary schools should be encouraged to use computer-assisted instructions (CAI) in the preparation, monitoring and evaluation of examinations so as to improve efficiency. Report card generations should be computer-based.

iii. All teachers should be encouraged to use computer-assisted instructions (CAI) in curriculum delivery so as to promote better academic performance in schools through compulsory training in the use of various computer-packages.

iv. The use of power-point, Ms-Word, Ms-Excel, Ms-Access and other computer-based packages in enhancing instructional delivery in secondary schools should be strongly encouraged as they make classroom learning real and enjoyable consequently enhancing the learners' attention.

v. The use of computer-assisted instructions (CAI) in schools should be promoted by relevant authorities as it creates a positive attitude in learners towards a variety of subjects.

vi. Relevant authority should acquire appropriate accounting packages for school bursars and enhance training of accounting personnel in schools.

vii. Training of teachers in the use of computers in schools should be enhanced and deeply supported by the Ministry of Education.

viii. The Ministry of Education should make the Kenya Institute of Curriculum Development (KICD) digital content for all subjects in secondary schools accessible and affordable to schools.

ix. Further research in the use of computer-assisted instructions (CAI) in schools should be carried out so as to explore useful insights in this area and consequently add value in the world of information and computer technology (ICT) use in schools.

x. Provision of electricity power in schools and enhancing the support of the school computer systems.

5.5 Suggestions for Further Study

Further studies should be carried out in the use of computer-assisted instructions (CAI) in school store keeping, library services, accounting, secretarial services, curriculum delivery and other school managerial procedures so as to unveil new strategies which will promote and enhance efficiency in technology-driven change management. Similar studies should be conducted in other districts and counties for the purpose of comparison and discovery of new trends which can promote healthy competition and subsequent improvement of educational standards in the country.

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