COMPUTER ASSISTED INSTRUCTION (CAI) AS A STRATEGY IN INSTRUCTIONAL DELIVERY MANAGEMENT: TECHNOLOGY DRIVEN CHANGE IN SECONDARY INSTITUTIONS IN KENYA

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ABSTRACT
The aim of this study was to explore how computer assisted instruction (CIA) may be used as a strategy in instructional management in secondary schools in Githunguri Sub-County. The study sought to fulfill the following objectives; To establish the extent to which computer assisted instruction are utilized by teachers in secondary schools in Githunguri District, To establish the level of use of computers in performing school managerial tasks. The study was guided by the theory of Motivational Design of instruction by Keller, (1999) which advocates for four interrelated stages which largely constitute processes involved in instruction. Literature review revolved mainly on Computer Assisted Instruction (CAI), Change in an Organization, Computer-Assisted Instruction in Organizations and Organizations' Strategies. The study dwelt on a descriptive survey design using the mixed methodology with a target population of 35 public secondary schools in Githunguri Sub-County. Two schools where used during the piloting stage and were excluded during the actual study. Ten schools were purposively and randomly sampled for the study focusing mainly on 10 principals, 10 teachers of computer, 10 storekeepers, 10 librarians and 10 bursars. A total of 100 students were also sampled for the study. Questionnaires and interview guides were mainly used during the data collection exercise. Collected data was analyzed using the statistical package for social sciences (SPSS). Data which were qualitative in nature was analyzed thematically as guided by research questions. Quantitative data was analyzed by use of the Pierson coefficient correlation approach for purposes of comparison. The study results and findings were mainly presented by use of bar graphs. The study concluded that Ms Power point program was the most commonly used strategy to accomplish instructional delivery in the sample schools reflecting 98.0% in comparison to other related computer programs. The study revealed that the use of computer assisted-instruction (CAI) in the management of school practices was found to have a positive change and impact on the academic performance of learners. The findings hence confirm that only a few schools fully utilize computer technology in running and managing their internal procedures and from the findings, 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.

Key Words: Computer Assisted Instruction (CAI), technology-driven change, organizational change, effectiveness, efficiency

1.1: INTRODUCTION
There has been great concern and advocacy by international institutions on the integration and use of Information Communication Technology (ICT) in the education sector as a measure of strengthening the implementation of quality education in contemporary institutions. Widespread commitments and attempts have been made by the World Education Forum (2000) and Kenya to

attain Education For All by the year 2015. A study conducted by Njeru and Orodho, (2003), concluded that education is a basic human right and need. In the same context therefore, education is a force that contributes towards the development of all-round citizens and strengthens the establishment of strongly bound and participatory communities. Indeed, economic and social returns of education are so intrinsic and considerable that access to quality education is internationally recognized as a basic human right. For the access of quality education to be achieved to extensive productive levels, there has been keen emphasis from educational experts on the need for institutions and instructors in particular to fully embrace Information Technology (IT) as a means for delivery in teaching and learning. This is the reason why education stakeholders continue to advocate for mechanisms and strategies that open avenues for Information Technology (IT) in all institutional levels. Modern institutions continue to experience dynamisms based on environmental factors, changing parenting styles, evolving technology as well as other hidden factors that contribute to institutional change which need to be successfully managed. Within the context of school mission and vision, instructional delivery forms a key component under which there has been extensive need to achieve by use of technology. Computer Assisted Instruction has become a fundamental catalyst in the creation of favourable instructional environment for quality education and improved institutional performance.   The influential role played by computer assisted instruction in ensuring rapid curriculum delivery in contemporary institutions continues to enjoy top priority in the eyes of productive instructors.   This study aimed at investigating computer assisted instruction as a strategy in instructional delivery in the management of technology-driven change in secondary schools in Kenya.

1.2 STATEMENT OF THE PROBLEM

In cognizance of the fact that curriculum implementation is core responsibility of modern institutions to their customers, it is imperative that contemporary institutions ensure prompt provision and delivery of quality education at all times. Various mechanisms and strategies have been utilized in the achievement of such a noble tasks by the custodians and experts of curriculum implementation. The complexity of modern lifestyles, the competitive level of educational needs and the logistics of accessing quality education have been experiencing a dynamic change in the contemporary society. The use of quality technology in modern educational trends has not only been of great necessity but almost indispensable for effective and efficient curriculum delivery. In a bid to rapidly move towards the achievement of quality academic standards, it is fundamental that educational stakeholders fully embrace the integration of computer assisted instruction in the management of instructional delivery. As a strategy of managing technology-driven change, contemporary institutions are charged with the responsibility of effectively managing curriculum delivery through the extensive use of computer assisted instruction. A majority of Kenyan institutions have merely engaged in the use of computer assisted instruction at a worryingly low level despite the great need to take advantage of such a strategy. In Githunguri Sub-County, a greater percentage of modern secondary schools have neglected the use of computer assisted instruction in curriculum delivery procedures that are directly related to admirable academic standards. Whether the relevant stakeholders have maintained ignorance of such instruction or access to the same facilities and resources is subject to discussion. It is within such a glaringly ugly scenario that the researcher sought to investigate computer assisted instruction as a strategy in instructional delivery in the management of technology-driven change in secondary schools in Kenya.

1.3 PURPOSE OF THE STUDY

The purpose of the study was to investigate computer-assisted instruction as a strategy in instructional delivery in the management of technology-driven change in secondary schools in Kenya.

1.4 RESEARCH OBJECTIVES

i. To investigate the extent to which computer applications are utilized by teachers in instructional delivery in secondary schools in Githunguri Sub-County.
ii. To find out the level of use of computer Assisted instruction in performing school managerial tasks in the management of technology driven change in secondary schools in Githunguri Sub-County
iii. To suggest recommendations for education stakeholders in managing technology driven change in secondary schools in Githunguri Sub-County

1.5 RESEARCH QUESTIONS

i. To what extent are computer applications utilized by teachers in instructional delivery?
ii. What are the levels of use of computer Assisted instruction in performing school managerial tasks in the management of technology driven change?
iii. How can education stakeholders assist in managing technology-driven change in secondary schools in Githunguri Sub-County?

SIGNIFICANCE OF THE STUDY

The study greatly benefited many stakeholders in education in many ways.

i. The study offered vital insights for teachers on the need to fully embrace use of PowerPoint computer application for curriculum delivery.
ii. The study offered educational planners with significant recommendations in the utilization of computer assisted instruction in managing technology driven change in the education sector.
iii. The study provided beneficial aspects to regional education stakeholders on the significance of utilizing computer assisted instruction in managing school resources.
iv. The study provided curriculum planners with beneficial information on proper integration of CAI in instructional management for quality institutional achievement.
v. Relevant stakeholders benefited from the study on the need to supply schools with more computer resources for efficient management of technology driven change in modern institutions.

2.1: LITERARUTURE REVIEW
2.2.2: TECHNOLOGY-DRIVEN 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 instruction in institutions, quality performance in the school system is vital. The researcher further states that all institutions should create and develop policies to acquire and utilize computer-assisted instruction. Arora, (2009) suggests that basic reasons for change include the multiplication of technological innovations, an increase in the cost of basic resources, competition, and 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.

2.2.3: 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.

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 and allocation of technology etc. Behavioral 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.

Implementing change involves three strategies of paramount importance which include the top down strategy, the bottom-up strategy and finally, the contingency strategy. 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 behavioral changes that must accompany technological changes. Such neglects are 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 information technology (IT) to increase organizational performance.

2.2.4: COMPUTER-ASSISTED INSTRUCTION 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 practice 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.

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. 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.

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.

2.2.5: 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) in a study conducted on organizational strategies claimed 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.

2.3: RESEARCH METHODOLOGY

The study dwelt on a descriptive survey design using the mixed methodology with a target population of 35 public secondary schools in Githunguri Sub-County. Two schools where used during the piloting stage and were excluded during the actual study. Ten schools were purposively and randomly sampled for the study focusing mainly on 10 principals, 10 teachers of computer, 10 storekeepers, 10 librarians and 10 bursars. A total of 100 students were also sampled for the study. Questionnaires and interview guides were mainly used during the data collection exercise. Collected data was analyzed using the Statistical Package for Social Sciences (SPSS). Data which were qualitative in nature was analyzed thematically as guided by research questions. Quantitative data was analyzed through inferential statistics and presented mainly by use of descriptive statistics.

2.4: RESEARCH FINDINGS AND DISCUSSION
2.4.1: EXTENT OF UTILIZATION OF COMPUTER ASSISTED INSTRUCTION BY TEACHERS IN SECONDARY SCHOOLS

Item (i) of the research question required the establishment of the extent to which teachers utilized computer applications in instructional delivery. 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 computer applications in instructional delivery by instructors. The study findings are shown in figure 1 below.
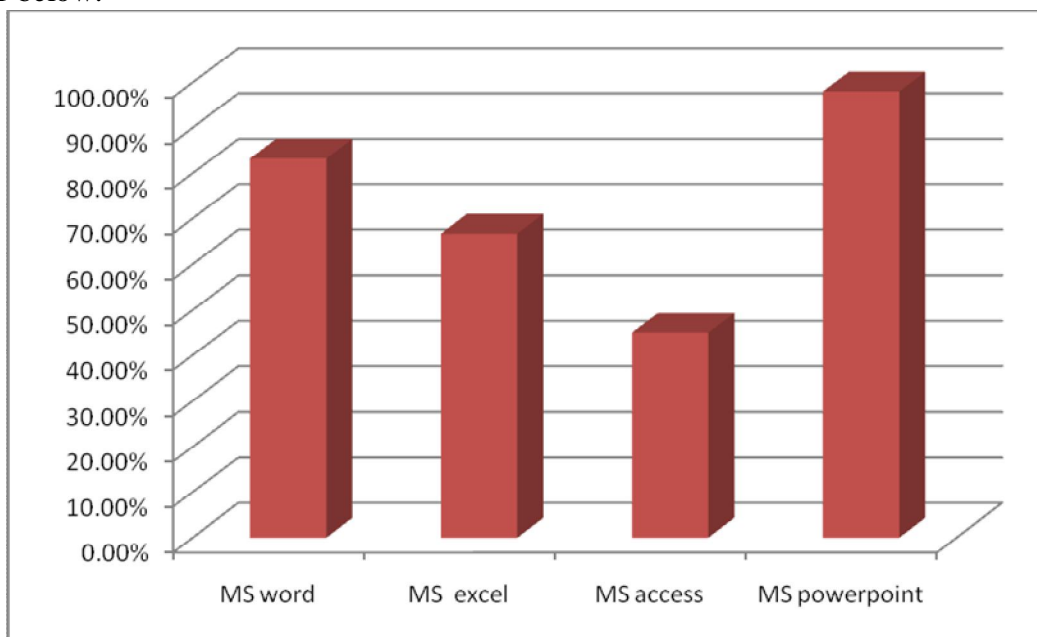

Figure 1: Percentage rates of use of different computer applications in instructional delivery

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 instruction (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 revealed 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.

2.5   APPLICATION   OF   COMPUTER-ASSISSTED   INSTRUCTION   (CAI)   IN MANAGING TECHNOLOGY-DRIVEN CHANGE

Item (ii) of the research questions required an assessment of the application of computer-assisted instruction (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.
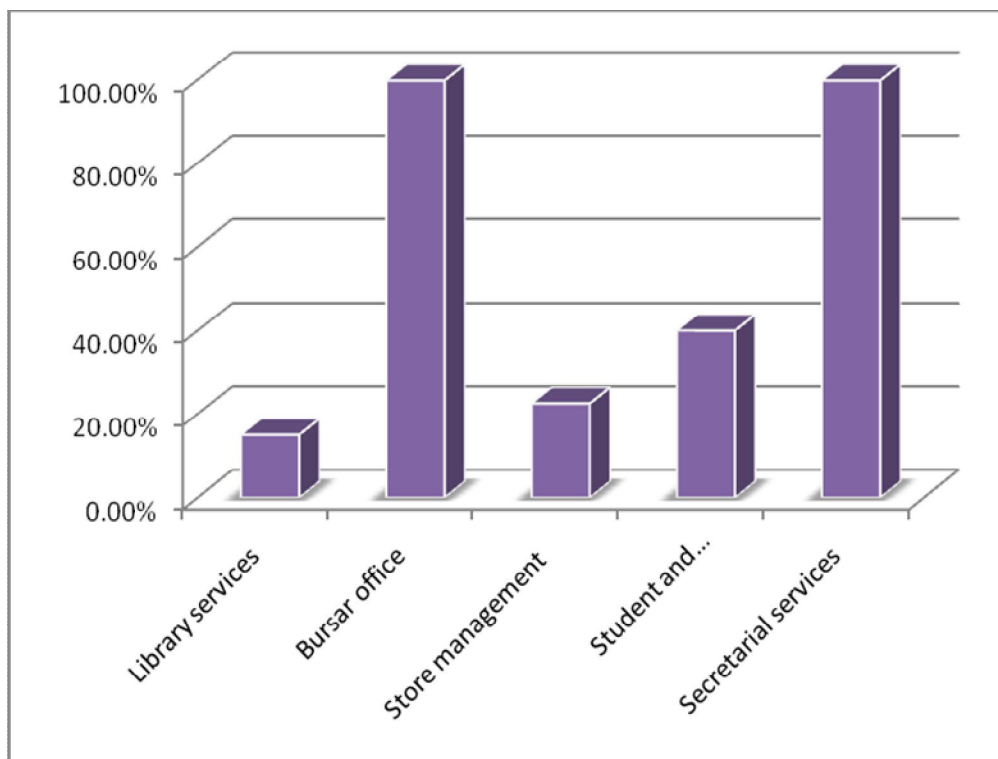

Figure 4.3: Application of computers in performing school duties

The study sought to establish the level of use of computers in performing school managerial tasks. The figure shows 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 therefore

showed 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 (IT) use who suggested that computer-assisted instruction (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.

2.6 SUGGESTIONS FOR EDUCATION STAKEHOLDERS INVOLVEMENT IN MANAGING TECHNOLOGY-DRIVEN CHANGE IN SECONDARY SCHOOLS

Item (iii) of the research questions required recommendations for education stakeholders to assist in the management of technology-driven change in secondary schools. This was measured in terms of gathering the opinions of school managers on ways of improving the management of technology-driven change in secondary schools.

As per Table 1 the study sought to establish suggestions based on opinions of school administrators on strategies for improving the management of technology-driven change in secondary schools. The table shows that in the sampled schools, provision of more computer facilities and recruitment of more computer teachers extensively dominated the opinions of school managers reflecting 42% as compared to provision of interlinked library services to schools for efficiency and power supply to public institutions which reflected 27% of the sampled managers offering suggestions for improving the management of technology-driven change. Computer related refresher courses were reflected by 15% of the sampled managers while provision of free internet services to schools by the government was reflected by 16% of the sampled institutional managers.

Table 1: The table below shows results on the suggestions for improving the management of technology-driven change

	%
Provision of more computer facilities	22
Recruitment of more computer teachers	20
Computer related refresher courses and workshops for school managers	15
Government to provide free internet to public secondary schools	16
Power supply to public institutions by the government	14
Provision of interlinked library services to schools for efficiency	13
Total	**100**

CONCLUSIONS AND RECOMMENDATIONS

The study 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 deliver in

schools. The study further 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 supportive in strengthening assertions and claims on teaching strategies through 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. In addition, the study findings point a strong indication that most schools have not fully embraced the use of computer assisted instruction in the management of their departmental procedures which remains a great challenge to school managers. Key recommendations to relevant authorities were outlined as;

1. Broaden and tighten structures that would facilitate and promote supply of computer facilities to all secondary schools.
2. Strengthen legal framework leading to the employment of extra computer teachers in secondary schools.
3. Regular training of institutional leaders and school top management personnel in computer-related programs.
4. Reduction of internet service costs, hardware and software costs making them affordable to institutions.
5. Provision of electric power to secondary schools for use of computer resources.
6. Offering free computer repair and maintenance services to secondary schools.
7. Use of highly qualified computer experts in the sourcing, operation and repair of computer resources.
8. Formal recognition and reward as a motivation to secondary institutions that excel in computer use in instructional delivery.
9. Strengthen structures that would enhance school security and improve safety standards of school computer resources.
10. Formalize structures and systems that would promote easier sharing of school library information, financial management skills, human and other school resource management for increased efficiency and effectiveness.

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