IOSR Journal Of Humanities And Social Science (IOSR-JHSS)
Volume 29, Issue 11, Series 9 (November, 2024) 01-14
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

Determinants Of Principals' Management Strategies On Provision Of Information Communication Technology Infrastructure In Public Day Secondary Schools In Kamukunji Sub County, Kenya

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Abstract
The study sought to determine the influence of principals' management strategies on provision of Information Communication Technology *infrastructure in public day secondary schools in Kamukunji Sub County, Kenya. The specific objectives of the study were: To determine the influence of principals' management strategies of mobilization of financial resources and to examine the influence of principals'management strategies on capacity building of staff on provision of ICT infrastructure in public day secondary schools in Kamukunji Sub County, Kenya. The study was guided by the ICT Theory whose proponents are Davis, Bagozzi & Warshaw of 1989. This is due to increase in the extent of use of ICT in schools for classroom instruction and for schooladministration and management. The study used the descriptive survey research design which helped the researcher to collect and compare data from the phenomenonat the same time in the study. The study used census sampling technique to cover the entire study population. The research instruments used were document analysis, questionnaires as well as observation checklists. The target population was all the four public day secondary schools. The total respondents of the study were 40,consisting of one SCDE, one QASO, 4 principals, 5 deputy principals, 6 ICT teachers and 23 HODs. Piloting was randomly conducted in one-day school and all the deviations and ambiguities from the expected research responses realized, was eliminated and corrected by consulting the research supervisors. SPSS version 29.0 was used in testing the reliability of the measurement items and Cronbach's Alpha reliability coefficient of 0.942 across a number of 36 items was obtained. This was an excellent test of reliability since the value obtained was above 0.80, meaning that the scale used was fine and satisfactory according to Mugenda (2003). Quantitative data obtained from the study, was analyzed using SPSS and the measuresof central tendency like the mean was obtained. Similarly, calculation of standard deviation was done to determine the measure of variability of the obtained data. The results of the study revealed that principals had provided ICT infrastructure in their schools but they were not adequate. The capacity building of staff was not adequate as some teachers lacked essential ICT skills. The study concluded that most of the principals have not practiced better management practices for provision of ICT infrastructure. The study made several recommendations and among them was that, the MOE should design policies that support provision of ICT in all secondary schools.*

Keywords: *Information Communication Technology, Financial Resources, Capacity Building*

Date of Submission: 15-11-2024 Date of Acceptance: 25-11-2024

I. Introduction

Background of the study

In an effort to realize Education for All (EFA), there is increased demand for education among people across the world. This has led to emergence of educational management as a discipline of study in the university. School management, leadership and governance issues are crucial to achieving institutional change for better performance (Garrison & Vaughan, 2013). School administration and management has become effective through use of ICT in school management and in education systems. The systems are essential tools for decision-making and in offering e-leadership in education management and administration. The use of information communication technology has contributed greatly to management of education. This calls the need for management and leadership strategies that influenceprovision of ICTinfrastructure (Mbaka, 2014).

The government of Kenya has made effort to provide quality education towards achieving of the Vision 2030. The government is investing heavily in education through budget allocations to schools to ensure that all learners haveaccess relevant to education. It has ensured equity in allocation of other physical and human resources in education. Scholars have acknowledged the role of information communication in education in service delivery and in classroom instructions. This has helped in investing in provision of ICT infrastructures in education. Similarly, the role of ICT in education towards achieving the sustainable development goal number four has been supported and acknowledged by the National Education Sector plan (NESSP) of 2018 to 2022. It has greatly contributed to curriculum designs, innovation and development, curriculum implementation, monitoring and evaluation as wellas in the development of educational management information systems (Ministry of education, 2021).

The competence Based curriculum (CBC) recommends use of ICT in education to promote digital literacy among the learners and teachers as core competence skill in the 21st century. This call for mobilization of resources, capacity building of teachers and principals, stakeholder involvement and involvement of staff in decision making to provide the ICT resources required in schools. As a result, the government through the MOE in conjugation with the ministry of ICT has developed Education Management Information Systems (EMIS) for data management in the schools which has helped educational managers in decision making. The national ICT policy, which is all-inclusive in nature and scope has continued to promote equity and sustainability in the use of ICT in research and innovations,trainings and in education management (Ministry of education, 2021).

Further, the national ICT policy framework of 2021, recommends capacity building of stakeholders to bridge the knowledge gap in digital literacy for effective curriculum instruction and educational management. The teacher training institutes are required to provide training programs for ICT integration in education, to increase the frequency of teacher trainings and ensure that teacher provisional development contact hours are enough across all levels. This management strategy is aimed at ensuring equitable access and provision of functional, sustainable and adequate ICT infrastructure in all the schools (Ministry of education, 2021). Ultimately, the successful implementation of the national ICT policy and the Basic education act, 2013 requires concerted efforts and stakeholder involvement in decision making and in provision of ICT infrastructure. Principals as education managers, providers and implementers should provide schools with an opportunity for a well- coordinated management strategy for to mobilization of financial resources to meet the increasing demand for ICT infrastructure in education (Ministry of education, 2021).

The principal's management strategies can influence provision of ICT resources for teaching, learning and other administrative purposes. Schoolprincipals should strive to bring changes in the management through use of ICT. Such changes involve mobilization of resources, capacity building of staff, stakeholder involvement, and involvement of staff in decision making onprovision of ICT infrastructure. Provision of ICT infrastructure entails: the procurement and installation of ICT hardware and software, setting up ICT laboratories and classrooms, ensuring there is reliable internet connectivityand implementing security measures in ICT infrastructure (Ministry of education, 2021).

ICT Infrastructure are the electronic devices such as smart phones, tablets, computer desktops, laptops, CCTVs, projectors, printers, scanners, fax machines, telephones, mobile phones and internet infrastructure, social media platforms necessary in the school management. Mobilization and provision of these resources is crucial in improving the education system. School principals participate in resource mobilization as they are the core of the national education system. They lead education institutions towards the achievement ofthe strategic objectives of the Continental Education Strategy for Africa (CESA 16-25), Sustainable Development Goal, (SDG 4) and the Education Agenda 2030 (Muhu, 2017).

II. Statement Of The Problem

Data from the Kamukunji Sub County education office indicates that sixty-three percent of the schools in Kamukunji Sub County are County day schools, which are characterized with low populations of students from low- income earning families. This directly influences the schools fee collectionand negatively affects the school financial resources, as the school catchments is slam areas such as Mathare slams, Baba dogo, Korogosho, Dandora, Majengo, Bahati and ShauriMoyo slams, Mr. Osano (2023) the Sub County QASO. Since parents are key stakeholders in provision and mobilization of financial resources, the Sub County lags behind in provision of ICT infrastructure as most have shortage of basic ICT facilities with inadequateICT personnel. Therefore, the study aimed at determining the influence of Principals' management strategies on provision of ICT infrastructure in all the public day secondary schools in Kamukunji Sub County, Kenya.

In Nairobi City County, Kamukunji Sub County lags behind in the level of availability and accessibility of ICT infrastructure despite the efforts made by the principals. In Westlands Sub County, a case of two national schools each with a population of 2000 students, each has an average of 200 computers. In another case, an Extra-county school with a population of 1200, has an average of 60 computers. Each school in Starehe Sub County has at least an active internet connectivity and some projectors according to the Kamukunji Sub County QASO, Mr. Osano, 2023.

This statistic is in tandem with and Kibra Sub County where a case of two national schools in Starehe Sub County with an approximate population of 1800 students have an average of 100 computers and at least one activeinternet connection and a projector. In Kibra Sub County, two extra-county schools with an approximate population of 1400 students, have an average of 60 computers each and at least one active internet connectivity and working projectors. This is according to the Nairobi county education office, 2023. Therefore, it is in the public domain that many schools in Kamukunji and especially the County day schools have touching shortage of basic ICT infrastructure like Computers, slow or no internet connectivity and inadequate projectors. They face financial constraints, inadequate ICT personnel, negativeperception on ICT use as well as, lack of capacity building of staff as well as insufficient technical support. Further, the existing ICT facilities are not well maintained (Chepkonga,2015).

Objectives of the Study

The study was guided by the following objectives: -

i) To determine the influence of principals' management strategies of mobilization of financial resources on provision of ICT infrastructure in public day secondary schools in Kamukunji Sub County, Kenya.

ii)To examine the influence of principals' management strategies on capacity building of staff on provision of ICT infrastructure in public day secondary schools in Kamukunji Sub County, Kenya.

Research questions

The study sought to answer the following questions: -

iii) What is the influence of principals' management strategy of mobilization of financial resources on the provision of ICT infrastructure in public day secondary schools in Kamukunji Sub County, Kenya?

iv) To what extent has the principals' management strategy of capacity building of staff influenced the provision of ICT infrastructure in publicsecondary day schools in Kamukunji Sub County, Kenya?

Significance of the study

The findings of this study may be used to guide policy makers in education in understanding the influence of principals' management strategies on provisionof ICT infrastructure in public secondary schools in Kenya. The study wasalso geared towards providing better insights on challenges and intervention strategies facing provision of ICT infrastructure in education. Data obtained may help to know the level and adequacy of provision of ICT facilities andthis may help the MOE improve in provision of ICT facilities. It can help the government to improve the school ICT budget allocation and capitation. The principals may in turn become more accountable and transparent to ICT resources at their disposal. The study may help the TSC to improve on the capacity building of teachers for TPD.

Finally, the study aimed at filling the gaps in research in Kamukunji Sub County to help educational scholars and other researchers on studies related to ICT in the field of education and in other sectors for the betterment of the country at large.

III. Review Of Related Literature

Introduction

This chapter gives a review of the literature related to the variables that guidedthe study. It provides a detailed information on the influence of Principals management and administrative strategies on provision of ICT infrastructure.It gives an overview of the dependent and independent variables of the study. This chapter

concludes by describing the theoretical and conceptual framework that was used to guide the study.

Concept of provision of ICT infrastructure in public secondary schools

The government of Kenya demonstrates a commitment to advancing information and communication technology (ICT) infrastructure by actively promoting local manufacturing and assembly of ICT equipment. By encouraging the production of ICT hardware within the country, thegovernment not only supports the growth of the domestic technology industry but also ensures a more sustainable and self-reliant approach to meeting the technological needs of various sectors, including education. This initiativealigns with broader economic goals, fostering innovation and creating job opportunities within the technology sector.

In addition to promoting local ICT manufacturing, the Kenyan government employs a strategic approach to enhancing ICT facilities in schools.Recognizing the pivotal role of ICT in education, the government provides incentives to school principals, encouraging them to prioritize and integrate ICT resources within their institutions. This multifaceted support extends beyond hardware provision, encompassing software development educational programs. By investing in software development, the government empowers educational leaders to leverage cutting-edge tools and platforms, enhancingthe overall ICT ecosystem in schools and facilitating a more technologically adept student body (Ibara, 2014).

Moreover, the government's commitment to the integration of ICT in education is evident in its effortsto address infrastructural challenges. Rural electrification projects targeted at schools ensure a stable energy supply, critical for powering ICT equipment. Additionally, the government focuses on maintaining and improving road conditions to enhance accessibility to schools. These initiatives collectively contribute to creating an environment where the benefits of ICT in education can be fully realized, bridging the digital divide and promoting inclusive technological development across the nation (Oluoch,2016).

Principals' mobilization of resources and provision of ICT infrastructure

The integration of Information and Communication Technology (ICT) infrastructure in educational institutions is pivotal for preparing students for a technology-driven world. School principals play a crucial role in mobilizing resources to facilitate the provision of robust ICT infrastructure. Principals are not merely administrators; they are strategic leaders who shape the vision of educational institutions. Their leadership style and vision significantly influence how resources, including financial, human, and community support, are mobilized for ICT infrastructure (Muli, 2013).

Furthermore, navigating budgetary constraints is a challenge principal's facein their mission to provide ICT infrastructure. The principal's involvement in securing financial resources through methods such as grant applications, fundraising initiatives, and strategic budget allocation. Notably, the extent to which principals engage with the local community, businesses, and non- governmental organizations for support in ICT infrastructure provision is crucial in resource mobilization. The effectiveness of collaborative efforts in mobilizing resources and establishing sustainable ICT infrastructure is critically analyzed. Principals are key decision-makers in determining the typeof ICT hardware and software, the establishment of ICT laboratories, and the implementation of cyber security measures. Finally, beyond infrastructure,principals should prioritize the development of staff through training programsto enable effective ICT integration in teaching. The role of principals in fostering a technologically literate teaching staff capable of utilizing ICT tools for enhanced pedagogy is assessed (Muli, 2013).

Principals ought to adopt management strategies such as budget allocation for ICT and identification of other sources of financing school budget. The government capitation or school ICT budget allocation from the MOE helps principals in provision of ICT resources. Such resources include financial, physical and human resources. The principal works in conjunction with TSCin selection and recruitment of competent ICT staff and teachers in a school asa means of providing for ICT infrastructure and ensuring the school is provided with internet connectivity by the local government. Effective leadership by principals involves the act of mobilizing adequate ICT resources. These are needed to develop adequate, conducive ICT infrastructureand environment for staff, teachers and students in the school (Oluoch, 2016).

Principals seeks to identify funding sources from local ICT grants from the government and non-governmental organizations. They organize school fund drives to get financial aids towards mobilizing ICT infrastructure in theirschools. School information management systems can be made more effective and efficient by ensuring that schools strategic plan prioritizes ICT budget. This is because lack of quality and adequate ICT infrastructure hinders provision of better management services. Government policies on rural electrification and accessible roads has led to improvement in provision ofICT infrastructure (Sungbin Lim, 2014)

Principals, recognizing the financial implications of integrating ICT into their schools, actively seek funding from various sources, including local ICT grants from government initiatives and non- governmental organizations (Sungbin Lim, 2014). By strategically identifying and securing funding opportunities, principals

play a vital role in overcoming financial barriers to ICT implementation. Additionally, their efforts extend to organizing school fund drives, engaging the local community and stakeholders to contribute to the financial aid aimed at mobilizing ICT infrastructure. This collaborative approach not only enhances the accessibility of resources but also fosters a sense of shared responsibility for the technological advancement of the educational institution.

The effectiveness of school information management systems is contingent on adequate budget allocation and strategic planning that prioritizes ICT resources (Sungbin Lim, 2014). Principals, as leaders in educational institutions, can influence the integration of ICT into the school's strategic plan, ensuring that budget considerations align with the institution's long-term goals. Recognizing the pivotal role of information technology in facilitating better management services, principals advocate for robust ICT budgets to address the challenges posed by inadequate infrastructure. By doing so, they contribute to the creation of a conducive environment where information can be efficiently managed, fostering improved administrative processes and overall school management.

A study of the UNESCO Report of 2019 in Rwanda shows a team of international ICT experts providing secondary school students with ICT infrastructure. This represents the influence of donor agencies in mobilization of ICT resources to African countries, a strategy that Principals in Kenya can adopt as their management strategy. This is an effort to ensure that there is provision of adequate ICT infrastructures according to the UNESCO-ICT Competence based Curriculum Framework for Teachers and their students (Aurora & Tererai, 2018).

The school principal acts as a leader tasked with the responsibility of management of both physical and human resources. ICT leadership and management stems from a shared mission and vision to allow for community participation in mobilization of resources, Laaria Mingaine (2013). Effective leadership by principals involves the act of mobilizing adequate ICT resourcesneeded to develop a conducive ICT environment for staff, teachers and students in the school.

Principals' capacity building of staff and provision of ICT infrastructure

The Constitution of Kenya Article 53 (1) (b), states that every child in Kenya has the right to access quality and relevant education. The teachers and school principals too have the right for capacity building. The government has made the secondary school education compulsory and subsidized to all the learners and therefore need to make capacity building of staff free and compulsory to teachers. This will assist teachers to equip learners with technical skills to make them fit in the changing society due to technological advancements. ICT has been integrated in the curriculum and the teacher training institutes are offering ICT training to teachers who are posted in secondary schools as computer studies teachers (Ministry of education, 2021).

The Basic Education Act of 2013 Article 95(3) part (k), complements the national ICT policy as it advocates for use of ICT in educational administration and management to enhance capacity building of staff. The ministry of education in conjugation with the ministry of ICT has advocatesfor provision of ICT infrastructure in schools whose expertise in ICT has been enhanced. They have developed and promoted the use of and National Education Management Information System (NEMIS) in schools for governance and management of students' data and for library management systems. Teachers are required to attend seminars and workshops facilitatedby the MOE for training on the use of NEMIS in their schools.

Similarly, the sessional paper No. 1 of 2019, recommends use of ICT in education for research purpose and also for capacity building of teachers and training of learners across all levels of education. This had led to the need for procurement and installation of ICT infrastructure in the schools leading to improvement in the quality and relevance of the systems of education in Kenya. These policies highlight the need for management strategies thatinfluence provision of ICT infrastructures while ensuring that there is safety of school information systems and security of ICT resources. Educational managers are encouraged to embrace strategies for developing the capacity of staff while putting in place ethical considerations to bring total transformation in the education sector (Ministry of Education, 2021).

The vocational training colleges that are mandated for capacity building of staff by the Technical Vocational Education and Training (TVET) Act of 2013, have designed educational programs that identify the knowledge gaps among teachers. The teacher development contact hours and the frequency of ICT trainings have been increased to ensure that teachers have improvedaccess to more training by use of TVETS. The integration of ICT in education and the introduction of the competency based curriculum has seen teachers enroll for in-service training courses in the universities. This is supported by the Universities Act of 2012 which allows for Open Distance and e-Learning (ODeL) programs as advocated by the MOE to the employed staff.

Principals play a crucial role in supporting teachers to attend Teacher Trainingprograms for TPD. Training should be more frequent and the recommended professional development hours is 24 days in the teacher training institutesthat has availed the training resources. A study on the regional perspective of ICT in Rwanda

indicates that, between 2015 and 2016, the Rwanda Educational Board (REB) collaborated with UNESCO in training of teachers on the Rwanda ICT essentials in its education system.

This is a good management strategy, which Principals in Kenya, need to embrace to ensure proper training of ICT teachers and staff to acquire more ICT competencies. Similarly, a study on ICT in education in Zimbabwe (UNESCO KFIT Project, 2018), indicates that effective educational managers, should prioritize the needfor capacity building of staff in education. The study indicates that fifty percent of teachers trained on ICT in Rwanda, regularly use their competencies in their everyday teaching (Aurora & Tererai, 2018).

The ICT training for all the teachers and the capacity building of Principals as educational managers, is highlighted in the Kenyan Policy Framework for educational training (the National ICT Policy Framework of 2021). The Principals are encouraged to identify strategies to improve teachers and learners' digital knowledge, skills and attitudes (GoK, 2021). The MOE through introduction of the National Education Management Information System, (NEMIS) of 2017, for management of students' data in schools highlyadvocates for capacity building of staff to be able to use NEMIS. Training of staff should improves their basic computer literacy in using search engines andwebsites to get information and sharing of such information via emails (Mbaka, 2014).

Staff training and development is the Principals' strategy of human resource management in a school. Principals should offer effective training and professional development opportunities through Science, Technology, Engineering and Mathematics (STEM) in-service training to strengthen teachers' competencies and their thinking designs (Wu & Hu, 2019). This helps teachers and support staff to build their skills and confidence in using technology in the classroom and administrative work. This is done through workshops, mentoring programs, and online courses to help teachers stay up- to-date with the latest technological advancements. Capacity building of staff also involves encouraging and supporting ICT training for decision-making among the heads of the department in a school. It enhances institutional leadership and capacity for further research and development in ICT among staff (Sungbin Lim, 2014).

Principals should provide ICT facilities and ensure staff and ICT personnel,are familiar with information security and practices. Capacity building onnetwork security helps staff be able to establish mechanisms of detecting any sort of crime and terrorism in their school information systems. This ensures that all ICT users, school information and resources, are kept safe for use and that data stored in the computers cannot be corrupted and accessed by unauthorized personnel (Odiaga & Abeka, 2020).

The capacity building of staff by principals on cyber security enables them be able to detect on time cyber-attack and take preventive measures by people using ICT infrastructures. This helps them to understand the laws guiding the use of ICT so that in case of insecurity they can investigate and prosecutethose offending them in relation to cyber security issues. This is because the national ICT policy of both 2019 and 2021 on use of ICT in education,training, and research systems promotes ICT environments that are safe and secure to users and recommends them to observe ethical considerations (Ministry of education, 2021).

Theoretical framework

The study was guided by the ICT Theory whose proponents are Davis, Bagozzi & Warshaw of 1989. This is because there is increase in the extent of use of ICT in schools for classroom instruction and for school administration and management. The ICT theory of Technology Acceptance Model as well asthe Theory of Planned Behavior influences the management strategies of a leader (Yator, 2015). According to Yator, Technology Acceptance Model(TAM) theory has been widely adopted in organizational management. It is applied in education sector where, it helps in explaining the acceptable ICT usage behaviors. People have high potential of accepting or rejecting the use of information technology in their management strategies. TAM theory talks about the attitudes toward ICT the use. That managers and administrators of organization should have the right attitude and willingness towards use of ICT systems since the world is changing (Granić & Marangunić, 2019).

TAM theory, argues that there are two important elements that determine the behavior and use of information technology: The Perceived ease of use (PEOU) and the Perceived usefulness (PU) of ICT infrastructure available.The designs and features of ICT infrastructures provided by principals determines how the ICT adopters will perceive and use them in performing their tasks. That making effort to regularly use of ICT in offering ICT servicesin administration, dictates the Perceived usefulness which increases organizational efficiency and effectiveness (Granić & Marangunić, 2019).

In conclusion, the Principals' management strategies like mobilization and provision of financial resources for procurement and installation of functional adequate ICT infrastructure, will increase the use of ICT. The capacity building of staff, stakeholder involvement and involving staff in decisionmaking on provision of ICT infrastructure, will make them change their attitudes and perceptions towards use of ICT. This agrees with the TAMtheory in regard to perceived ease of use and perceived usefulness of ICTtools. Therefore, the study adopted TAM model theory to assist the researcher in establishing the influence of

Principals' management strategies on provisionof ICT infrastructure in public day secondary schools in Kamukunji SubCounty Nairobi County, Kenya.

IV. Research Methodology

Introduction

The research methods employed in the study are covered in this section. It highlights the research design, the target population, the sample size and sampling techniques, research instruments, validity and reliability of research instruments, data collection procedures, data analysis techniques that wereused in the study and ethical considerations.

Research design

This study used the descriptive survey research design. The design was appropriate since data from the phenomenon was collected and compared atthe same time as the study (Bryman, 2012). According to Wang (2015) the structures for the descriptive sample are usually acceptable if there are significant correlations between the variables at some point in time of study. The design was thus suitable as it aimed at definition of the characteristics of certain classes and estimation of the proportion of certain characteristics in order to making meaningfulpredictions.

Target Population

Target population refers to a large group of people, events or things of interest to the researcher and from which the sample is obtained Orodho (2004). The target population was four County public day secondary schools consisting of four principals, ten ICT teachers one QASO and one SCDE in the area of study. Sample size and sampling technique sample is a collection of items drawn from a population to characterize that population (Creswell, 2013).The study used census sampling technique tocover the entire study population which was a small area of study. Here, all the4 principals, 5 deputy principals, the 6 ICT teachers, 23 middle managers (HODs)in the four day schools, the QASO and the SCDE were selected forthe study.

Thus, the census sampling technique was suitable for this study because the required data was obtained from and within a small area of studyconveniently. This sampling technique was reliable since it was cost effective, more accurate and consumed less time as the area of study was small withonly four county day schools being investigated. In conclusion, every item of the study was observed using this technique in order to obtain satisfactory.

Responses from all the targeted respondents. The representation of respondentswas as shown in table 3.1 below:

Table 3.1: Sample representation of respondents in the Sub County

Respondent	Target Population (N)	Sample size(f)	Percentage (%)(Census)
ICT Teacher	6	6	100
HODs	23	23	100
D/Principals	5	5	100
Principals	4	4	100
QASO	1	1	100
SCDE	1	1	100
Total	**40**	**40**	**100**

Research instruments

The study used document analysis, observation check lists and questionnaires as the instruments for collecting data.

Questionnaires

The study made use of both the structured and open-ended questionnaires. Theopen-ended questions assisted in ensuring that the research respondents gave answers to questions on the influence of Principals' management strategies on provision of ICT infrastructure, in an exact manner as perceived in the regional and international countries (Wambungu & Kyalo, 2015).

Document analysis

The researcher did a literature review on existing records to gather information about the research problem even before the study. This assisted the researcher in understanding the background of the study to establish the significance of the study. More documents were requested to be availed by the researchrespondents to the researcher during the study for analysis (Wambungu & Kyalo, 2015).

Observation checklist

The researcher made thorough observations in the schools in Kamukunji Sub County on the availability and conditions of ICT infrastructural facilities in school. Detailed checklists were also prepared and given to the respondents to establish availability and adequacy of physical infrastructure provided by principals in the schools for better administration and management (Wambungu & Kyalo, 2015).

Influence of principals' mobilization of resources on provision of ICT infrastructure. Principals should adopt management strategies that promotes mobilization of ICT infrastructure in their schools. The strategies includes, school budgetallocations for ICT infrastructure, having school strategic plans that support provision of ICT infrastructure, identifying funding sources for ICT budget, being aware of school ICT budget allocation by the MOE, mobilizing resources for internet connectivity, establishing ICT classrooms which arefully equipped with internet connectivity, ensuring student-textbook ratio for ICT is adequate as well as ensuring that schools have sufficient ICT resources for administrative purpose and classroom instruction.

Table 4.4 below shows statistics/responses on the influence of principal on mobilization of financial resources for provision of ICT infrastructure.

Table 3.2: Responses on the influence of principal on mobilization offinancial resources

Variable indicators		SA	A	UN	D	SD	M	Std.	Decision
		(%)	(%)	(%)	(%)	(%)	ea n	Dev.	
The schools have	budget	4	7	16	8	1	3.	0.99	High
allocation for infrastructure	ICT	11.2%	19.4%	44.4%	22.2%	2.8%	14		perception
The schools strategic plans		0	1	21	12	2	2.	0.65	Low
supports provision of ICT		0%	1%	21%	33.3%	5.6%	58		perception
infrastructure The principals has identified		3	9	8	12	4	2.	1.18	Low
funding sources for ICT budget		8.3%	25.0%	22.2%	33.4%	11.1%	86		perception
The principals is aware of		11	9	11	3	2	3.	1.17	High
school ICT budget from theMOE		30.6%	25.0%	30.6%	8.2%	5.6%	67		perception
The principals has mobilized		12	13	2	4	5	3.	1.42	High
resources for internet		33.3%	36.1%	5.6%	11.1%	13.9%	64	1.45	perception
connectivity in school The principals has established		8	11	3	8	6	3.		High
ICT classrooms/laboratories		22.2%	30.6%	8.3%	22.2%	16.7%	19		perception
The ICT classrooms are fully		6	8	8	5	9	2.	1.44	Low
equipped and have internetconnectivity		16.7%	22.2%	22.2%	13.9%	25.0%	92		perception
The student-textbook ratio for		4	9	6	11	6	2.	1.30	Low
computer studies/ICT		11.1%	25.0%	16.7%	30.6%	16.7%	83	1.23	perception
The schools have sufficient		3	11	7	10	5	2.		Low
administrative, teaching		8.3%	30.6%	19.4%	27.8%	13.9%	92		perception

The data analysis shows that only 16 (44%) respondents, highly perceived that the schools had budget allocation for ICT infrastructure, the principals wereaware of school ICT budget from the MOE and that the principals had mobilized resources for internet connectivity in school. They also appeared to feel that the principals had established ICT classrooms/laboratories. Thus,there is a higher perception that principals' mobilization of resources is a good management strategy that positively influences provision of ICT infrastructure. On the other hand, 20 (56%) respondents had a lower perception that the school's strategic plans support provision of ICT infrastructure, the principals had identified funding sources for ICT budget,the ICT classrooms were fully equipped and have internet connectivity andthat the student-textbook ratio for computer studies/ICT is adequate. They had a low feeling that the schools have sufficient administrative, teaching & learning ICT resources. Based on these findings, it is clear that principals'poor management strategy of mobilization of resources negatively influences provision of ICT infrastructure in the schools.

Influence of principals' capacity building of staff on provision of ICTinfrastructure

Principals play a crucial role in supporting teachers to attend Teacher Trainingprograms for TPD organized by the employer or the by MOE. Training shouldbe more frequent and the recommended professional

development hours is 24 days in the teacher training institutes that has availed the training resources. The capacity building of staff and principals as educational managers, ishighlighted in the Kenyan Policy Framework for educational training (the National ICT Policy Framework of 2021). Staff training and development is the Principals' strategy of human resource management in a school. It enhances institutional leadership and capacity for further research and development in ICT among staff (Sungbin Lim, 2014). Table 4.5 below showsstatistics on the influence of Principals' capacity building of staff on provision of ICT infrastructure.

Table 3.3: Responses on the influence of principals' capacity building of staff

Variable indicators	SA (%)	A (%)	UN(%)	D (%)	SD (%)	Mean	Std .dev	Decision
The principals supports	4	16	11	4	1	3.50	0.94	High
capacity building of teachers	11.1%	44.4%	30.6%	11.1%	2.8%			perception
There is availability	4	8	10	13	1	3.03	1.08	High
teacher training programs	11.1%	22.2%	27.8%	36.1%	2.8%			perception
Professional developme nt	1	10	9	12	4	2.78	1.07	Low
contact hours are enough	2.8%	27.8%	25.0%	33.3%	11.1 %2			perception
There is availability	2	9	7	16		2.81	1.06	Low
training resources	5.6%	25.0%	19.4%	44.4%	5.6%			perception
The frequency of training is	1	0	11	20	4	2.28	0.78	Low
more often	2.8%	0%	30.6%	55.5%	11.1 %			perception
There is staff promotion for	2	4	11	9	10	2.42	1.18	Low
career progression	5.5%	11.1%	30.6%	25.0%	27.8 %			perception

This data analysis shows that 15 (42.9%) respondents, highly perceived thatthe principals supports capacity building of teachers, there is availability of teacher training programs and that the schools had experienced adequate skilled ICT teachers. On the other hand, the majority, 21 (57.1%) respondents, had a lower perception that professional development contact hours wereenough, there were availability of training resources and that the frequency of training was more often. They had also had a lower feeling that there was staffpromotion for career progression of teachers by the TSC. Based on these findings, it is very clear that principals' management strategy of capacitybuilding of staff has an impact on provision of ICT infrastructure.

Regression analysis

The purpose of conducting regression analysis was to assess the linearity of the relationship between the dependent and independent variables in the study.The findings are organized and discussed in the subsequent sub-sections.

Model summary

A Regression analysis was also conducted to determine the effects of different aspects of ICT infrastructure for schools that participated in the study. The measures of Provision of ICT infrastructure were combined and their means computed, after which the outcome was regressed against selected indices of mobile money usage. The model summary in table 4.14 below provides an overview of the goodness-of-fit of the regression model.

Table 3.4: Model summary

Model	R	R Square	AdjustedR Square	Std. Errorof the Estimate	Durbin-Watson
1	0.812a	0.660	0.603	0.29431	1.995

Table 3.4 presents the coefficient of determination, denoted as R^2, which is calculated to be 0.660. This value signifies that approximately 66% of the totalvariance in provision of ICT infrastructure is accounted for by the model. Conversely, around 34% of the total variance remains unexplained by the model. These results indicate that the independent variables do exert an influence on the provision of ICT infrastructure. The table further details the outcomes concerning the discrepancies between the dependent and independentvariables.

Regression Coefficients

The Coefficients table provided further information about the effects of individual predictor variables

on the dependent variable (Provision of ICT infrastructure), arrived at by a combination of multiple variables alluding to Provision of ICT infrastructure as presented in table 3.6.

Table 3.6: Coefficient of regression

	UnstandardizedCoefficients		Standardized Coefficients	t	Sig.
	Beta (β)	Std. Error	Beta ((β)		
(Constant)	-.107	.307		-.349	.730
Principals' mobilisation of	.141	.166	.133	.852	.094
resources Principals' capacity	.414	.166	.311	2.491	.018
building of staff					
Principals' stakeholder	.421	.136	.446	3.089	.004
involvement Principals' involving staff	.322	.131	.345	2.466	.020
in decision making					

The regression equation is as shown below;

Y= -0.107+0.141X1 +0.414X2 +0.421X3+0.322X4

When the independent variables are all zeros, this means that Provision of ICT infrastructure will be at -0.107 units. When the mobilization of resourcesincreases by one unit, Provision of ICT infrastructure increases by 0.141 units. When capacity building of staff increases by one unit, Provision of ICT infrastructure increases by 0.414 units, when stakeholder involvement increases by one unit the provision of ICT infrastructure increases by 0.421 and when involvement of staff in decision making increases by one unit, Provision of ICT infrastructure increases by 0.322 units. It's important to note that mobilization of resources did not seem to be a significant predictor (p value 0.094), while capacity building of staff, stakeholder involvement and involving staff in decision making were statistically significant influencer of Provision of ICT infrastructure (p value, 0.018, 0.004 and 0.020 respectively).

V. Summary, Conclusions And Recommendations

Summary of findings of the study.

This section gives the summaries of the findings obtained by the researcher according to the specific objectives of the study.

The study found that 16 (44%) of the respondents, highly perceived that the schools had budget allocation for ICT infrastructure, the principals were awareof school ICT budget from the MOE and that the principals had mobilized resources for internet connectivity in school. They also appeared to feel thatthe principals had established ICT classrooms/laboratories. Thus, there is a higher perception that principals' mobilization of resources is a good management strategy that positively influences provision of ICT infrastructure. On the other hand, 20 (56%) respondents, the majority had alow perception that the school's strategic plans support provision of ICT infrastructure, the principals had identified funding sources for ICT budget,the ICT classrooms were fully equipped and have internet connectivity andthat the student-textbook ratio for computer studies/ICT is adequate. They had a low feeling that the schools have sufficient administrative, teaching & learning ICT resources. Study findings also indicated that, the schools with budget allocation for ICT infrastructure showed a significant association (Chi- square = 12.484, p = 0.014), suggesting that there was evidence that, schools with budget allocations were different from those without when it in terms of the installation of ICT, establishment of ICT labs, and cyber security measures. Based on these findings, it is clear that principals' management strategy of mobilization of resources influences provision of ICT infrastructure in the schools.

The study discovered that, 15 (42.9%) respondents, highly perceived that the principals supports capacity building of teachers, there is availability of teacher training programs and that the schools had experienced adequate skilled ICT teachers. On the other hand, majority, 21 (57.1%) respondents had a lower perception that professional development contact hours were enough, there were availability of training resources and that the frequency of training was more often. They had also had a lower feeling that there was staff promotion for career progression of teachers by the TSC. It was also found that, there was a significant association (p = 0.026) between schools having experienced adequate skilled ICT teachers the ICT facilities. Based on these findings, it is very clear that principals' management strategy of capacitybuilding of staff has an impact on provision of ICT infrastructure.

The study realized that, 18 (50%) respondents, agreed that Principals' stakeholder involvement positively influences provision of ICT infrastructure. There was a highly perception that there is effective Parent-Principal communication in the schools and that schools had advisory committees (BOM & PA) as

management strategies to plan and advice on provision of ICT infrastructure. Similarly, an equal number of 18 (50%) respondents, had alow perception that there was parental involvement in provision finance of ICT infrastructure. They also appeared to have low feeling that there was community engagement in provision of ICT infrastructure in schools. It was revealed that community engagement in the provision of ICT infrastructure showed a marginally significant association with the implementation of ICT measures (Chi-square = 6.481, p = 0.090). More precisely, there was a significant association between schools having advisory committees (BOM & PA) for ICT planning and advice and the implementation of ICT measures (Chi-square = 12.094, p = 0.017). Based on this findings, it is also clear that Principals' stakeholder involvement is a management strategy that influences provision of ICT infrastructure in schools.

The study also discovered that 14 (40%) respondents, appeared to agree that principals' management strategy of involvement of staff in decision-making positively influences provision of ICT Infrastructure. This is because therewas a high perception that teachers were involved by principals in the development of school ICT policies and that teachers were also involved in implementing school ICT strategies. On the other hand, the majority, 22 (60%) respondents, had a low perception that teachers were involved in setting of school ICT goals and that teachers were involved in school ICT tendering projects. There was also a low perception that teachers were involved inmonitoring and evaluating ICT projects provided by principal. The finding of the study indicated that there was a significant association between teachers being involved in setting school ICT goals and the implementation of ICT measures(Chi-square = 14.141, p = 0.007).

There was also significant association between teachers being involved in the development of school ICTpolicies and the implementation of ICT measures (Chi-square = 11.613, p = 0.020). Additionally, there was a significant association between teachersbeing involved in implementing ICT strategies and the implementation of ICT measures (Chi-square = 15.933, p = 0.003). Study showed that there was a significant association between teachers being involved in school ICT tendering projects and the implementation of ICT measures (Chi- square = 17.187, p = 0.002). Based on these findings, the principals' management strategy of involvement of staff in decision-making has an impact on provisionof ICT Infrastructure schools

VI. Conclusions

The study concluded that the principals' management strategy of mobilization of financial resources influences provision of information communication technology infrastructures. This is because the results of the revealed that principals had provided ICT infrastructure in their schools but they were not adequate. This showed a gap on the Principals' management strategy of mobilization of resources since some ICT infrastructure like projectors and smart boards were not available in some schools. It was found that all schools had CCTV cameras for surveillance but they were not adequate too thus more needs to be provided.

The study also concluded that the principals' management strategy of capacitybuilding of staff influences provision of ICT infrastructure. It was discovered that the capacity building of staff was not adequate as some teachers lacked essential ICT skills making it difficult to use the available ICT infrastructure provided by the principals and therefore there is need for more capacitybuilding of staff. This can be attributed to shortage of training resources and inadequate as well as low frequency of staff by the principals.

The study also concludes that the principals' management strategy of stakeholder involvement has influence on provision of ICT infrastructure. It revealed that there was stakeholder involvement in provision of ICT resources but this strategy had not been fully actualized. The respondents had lower perception that there was parental involvement in provision finance of ICT infrastructure by principals. They also appeared to have a lower feeling that there was community engagement in provision of ICT infrastructure in schools. Based on this findings, the study concludes that Principals'stakeholder involvement is a management strategy that influences provision ofICT infrastructure in schools. This calls the need for the principals to improve their public relations with the community to harness theirpotential in providing the school with ICT facilities.

Further, based on the findings of this study, it is concluded that principals' involvement of staff and especially teachers in decision making process highlyinfluences provision of ICT infrastructure. It was discovered that some principals involved teachers in decision making processes regarding setting school ICT goals and policies but never involved them in the procurement, installation as well as in monitoring and evaluation of ICT projects. This too had an impact on implementation of the ICT strategies and usage of ICT infrastructure provided in schools.

From the findings of this study, it is concluded that the gender of the respondents does not influence management strategies and therefore has no influence on provision of ICT infrastructure. However, the age and highest level of academics of the respondents determines their work experience. The study found that these influenced the management strategies and had an impact on the level of provision of ICT infrastructure. Finally, the studyconcludes that many principals have not practiced better management practices for provision of ICT infrastructure to fully implement the national ICT policy of 2019 and the Basic education act of 2013 towards realization of digital literacy as a core competency skillof the 21st century.

VII. Recommendations

Based on the findings of the research conducted, the following are the recommendations ofthe study.

Recommendations for Policy

Since technology in 21st Century is a key driving force towards government systems, the government through the ministry of ICT should develop policies that continues to push for 100% digitalization in all the schools and in all government systems. School principals in their strategic plans should set policies that places the schools strategically in fully adopting ICT in management of education. They should develop school ICT policies that ensure staff and students meet the standards of the current technological trendsfor realization of digital literacy as a core 21st century competency skill.

The study recommends that the MOE should design policies that provide and support school ICT budget and create its awareness to the school mangers so that principals can reach out to the MOE for funds to procure and install functional and sustainable ICT infrastructure in schools. This is because the study found out that principals are not aware of school ICT budget from the MOE needed awareness on the same. A policy to increase government capitation to schools to enable them meet the costs of ICT infrastructurealongside other recurrent expenditures.

Policy makers to assess the teachers need for ICT and provide more and efficient software for school management information systems (SMIS). The ministry of ICT to provide experts from their field to go and train teachers on the same. A policy that each school should have ICT champion who oversees ICT operations to be set. Clear policies on professional development contact hours and the frequency of training to be developed by MOE in conjugation with TTI. There is need for more involvement of teachers in setting, planning and developing ICT policies and in purchasing of ICT materials as they are theones directly involved in the implementation process.

It is recommended that the government through the MOE should introduce a policy on the use of laptops and tablets instead of exercise books and pens by students during classrooms instructions. Teacher and students' textbooks should be informing of software other than hard copies so that ICT can be fully embraced for maximum utilization of ICT infrastructures provided. Policies toreplace physical meetings with online and interactive meetings to be developed as well. Finally, education stakeholders should develop a supportive policy environment for ICT infrastructure and ICT use in the schools.

Recommendations For Management Practices

The study recommends that educational managers should start programs for continuous upgrading of school ICT infrastructure. The old computers should be mopped up and replaced with new effective hardware to ensure use of updated ICT infrastructure. The study recommends upgrading of school ICT software and hardware. Managers should have budgets ICT infrastructure and prioritize training of teachers to be specialists in ICT maintenance as well as employing well trained ICT technicians to work for the school in supporting the ICT teachers. It is recommended that principals in their managementpractices allow staff to be part of decision making processes in the procurement of ICT infrastructure. ICT tenders to be given to people of high integrity to avoid loss of funds.

The study recommends more funding by stakeholders to be able to improve on ICT infrastructure and ICT security structures and measures. Concerning mobilization of financial resources and physical ICT infrastructure, the study recommends that the principals can reach out tostakeholders for further ICT support. This includes community engagement where they can ask the business community within their areas for financial and ICT support. The principals to collaborate with donor partners, well-wishers, sensitize and engage parents and the school alumni to facilitate provision of ICT materials. The principals are recommended to reach out to the National Government Constituencies Development Fund (NGCDF) for funds to put up ICT infrastructure and facilitate training of staff.

In terms of capacity building of staff, the study recommends that the MOE andthe principals should organize for international training of teachers and encourage staff to use ICT resources provided since through practice, knowledge is gained and the perceived ease of use ICT will increase. It also recommends need for more staff training and encourage peer training among staff and exchange programs with those endowed with sustainable ICT facilities. The QASO and SCDE are recommended to set sub-county school teams for frequent capacity building of teachers and principals on ICT. Teachers should make personal initiatives for capacity building. There is also need for provision of a more diversified internet and installation of more CCTVs cameras in for better management of schools. The study recommends need for enhancing security measures to ICT infrastructure by engagingthe personnel with such expertise.

The study recommends that teachers and principals can use internally generated resources by reaching out to the Intergovernmental Authority on Development (IGAD) for support in ICT infrastructural development within their school. Principals should involve local leaders like area MCA, MP and other political

groups as strategy for mobilizing resources, tap on other infrastructure put by the communities and do cost-sharing with stakeholders to reduce the costs of installation of ICT, regular repairs and maintenance. The BOM and the Principals are recommended to establish ICT committees to monitor and evaluate the ICT projects initiated. The principals should also provide each department in the school with the required ICT infrastructure to increase access and use of ICT. Classrooms should be installed with projectorsto facilitate learning through visual and audios to improve content mastery andretention.

Further, the study recommends mandatory construction of more ICTclassrooms which are fully equipped and well connected with internet to cater for the raising demand for ICT use, the way schools have science labs. The principal to improve the strength of internet connectivity in schools and extent connectivity from the administration block and computer labs to all students for research and learning purposes. This calls the need for the TSC to employ enough ICT teachers in each school as some schools had ICT facilities but did not have a computer teacher. TPD teams to appraise teacher ICT skills to identify and fill the possible gaps. Principals who are at the top of school management are recommended to be in the fore front towards championing ICT strategies.

Recommendations For Research

The research findings can be used by relevant stakeholders and the government as the basis for adequately equipping the schools with ICT infrastructure, to enhance efficiency in management at school level. From the research findings, academicians and researchers are recommended to establish exchange programs and carry out more research on other principals' management practices that influence provision of ICT infrastructure.

VIII. Suggestions For Future Research

Based on the findings obtained in this study, the researcher recommends that:

More research on ICT should be done especially on Robotics, machine learning as well as research on internet of things and how they can impact on the livelihood of people as we move towards industry 4.0 revolution asa result of emerging issues in education such as impact of Covid-19 pandemic.

Suggestions for further studies to be done by the ministry on the influence of principals' management strategies on provision of ICT infrastructure ina larger sample size to make it more effective.

In future, a study can be conducted on cyber security and ICT applications, since with increased integration of ICT the issue of cyber security has become increasingly important.

References

[1] Aurora, C., & Tererai, D. (2018). Ict Transforming Education In Africa Unesco-Kfit Project Update, January-March- 2019. Https://Unesdoc.Unesco.Org/Ark:/48223/Pf0000367858.Locale=En

[2] Babalola, S. (2020). A Two-Prong Approach For Enhancing Teaching And Learning For 21st Century Skills Development In Oyo State, Nigeria. 2, 47. Https://Doi.Org/10.35293/Tetfle.V2i1.87

[3] Bryman, A. (2012). Social Research Methods (4th Ed). Oxford Universitypress.

[4] Chepkonga, S. (2015). Determinants Of Principals' Level Of Integration Of Information Communication Technology In Management Of Public Secondary Schools In Nairobi County, Kenya [Thesis; En_ Us, University Of Nairobi]. Http://Hdl.Handle.Net/11295/90029

[5] Creswell, J. W. (2013). Techniques And Principles For Developing Grounded Theory (3rd Ed). Thousand Oaks, Ca: Sage.

[6] Eden, S., & Heiman, T. (2013). Teachers' Perceptions, Beliefs And Concerns About Cyberbullying. British Journal Of Educational Technology, 44(6),1036–1052. Https://Doi.Org/10.1111/J.1467-8535.2012.01363.X

[7] Garrison, D., & Vaughan, N. (2013). Institutional Change And Leadership Associated With Blended Learning Innovation: Two Case Studies. The Internet And Higher Education, 18, 24–28. Https://Doi.Org/10.1016/J.Iheduc.2012.09.001

[8] Gok. (2021). Republic Of Kenya, Ministry Of Education. Policy On Information And Communication Technology In Education And Training. 90.

[9] Government Of Kenya. (2013). Republic Of Kenya, Laws Of Kenya. The Basic Education Act, No. 14 Of 2013. 65.

[10] Granić, A., & Marangunić, N. (2019). Technology Acceptance Model In Educational Context: A Systematic Literature Review. British Journal Of Educational Technology, 50(5), 2572–2593.Https://Doi.Org/10.1111/Bjet.12864

[11] Heale, R., & Twycross, A. (2015). Validity And Reliability In Quantitative Research. Sudbury, Ontario, Canada. Https://Doi.Org/10.1136/Eb-2015- 102129

[12] Ibara, E. C. (2014). Information And Communication Technology Integration In The Nigerian Education System: Policy Considerations And Strategies.21(3), 12.

[13] Kiteme, S. N. (2013). Influence Of Stakeholders' Participation On Completion Of Infrastructural Projects: A Case Of Public Secondary Schools In Mwingi-East District [Thesis; En_ Us, University Of Nairobi]. Http://Erepository.Uonbi.Ac. Ke Lavin, B., & Jie, Q. (2013). Knowledge Mobilization In Education In Canada And The Role Of Universities.

[14] Mbaka, N. K. (2014). Technology In Enhancing 21st Century Learning Skills In Public Secondary Schools In Kenya. 95.

[15] Ministry Of Education. (2019). Republic Of Kenya, Ministry Of Education, Sessional Paper No. 1 Of 2019 On A Policy Framework For Reforming Education And Training For Sustainable Development In Kenya. 232.

[16] Ministry Of Education. (2021). Policy On Information Communication Technology In Education And Training. 84.

[17] Muhu, H. (2017). The Continental Education Strategy For Africa (Cesa) 2016- 2025. 1, 24.

[18] Muli, M. A. (2013). Institutional And Principals' Factors Influencing Mobilization Of Financial Resources In Day Secondary Schools In Kitui Central District, Kitui County, Kenya. University Of Nairobi, 97.

[19] Musa, A., & Ogunode, J. (2022). Deployment Of Information Communication Technology (Ict) For Effective Security

Management In Nigerian Educational System. 9, 146.
[20] Mwanzia, O. (2014). The Influence Of Stakeholders' Participation Oncompletion Of Infrastructural Projects In Public Secondary Schools In Kitui West District [Thesis; En_ Us, University Of Nairobi]. Http://Hdl.Handle.Net/11295/74912
[21] Nawate, Z. S. (2017). Framework For Using Ict To Extend Access To Basic Education In Alternative Provision Of Basic Education Institutions In Kenya. 60.
[22] Odhiambo, F., & Omoro, Dr. N. (2015). Reconsidering Education For All At A Time Of Change: Influence Of Economic Factors On Access To Secondary Education In Narok County, Kenya. University Of Nairobi, 3(12), 139–152. Https://Doi.Org/10.31686/Ijier.Vol3.Iss12.495
[23] Odiaga, G. A., & Abeka, S. (2020). An Information Security Awareness Framework For Secondary School Teachers In Kenya. Volume 7(Issue 5),100.
[24] Oluoch, Dr. D. (2016). Strategies Of Enhancing Ict Use In The Delivery Of Management Services In Public Secondary Schools In Siaya County InKenya. University Of Nairobi, Vol.12. Https://Doi.Org/10.19044/Esj.2016.V12n28p375
[25] Sika, V., Sambuli, N., Orwa, A., & Salim, A. (2014). Ict And Governance In East Africa: A Landscape Analysis In Kenya, Uganda And Tanzania 2014. 46.
[26] Suella, H., & Paula, A. (2018). Capacity Building In A Changing IctEnvironment. 76.
[27] Sungbin Lim. (2014). A White Paper On Ict In Education In Korea. Korea Education And Research Information Service (Www.Keris.Or.Kr), Pm 2014-7, 172.
[28] Taddeo, C., & Barnes, A. (2016). The School Website: Facilitating Communication Engagement And Learning. British Journal Of Educational Technology, 47(2), 421–436. Https://Doi.Org/10.1111/Bjet.12229
[29] Tanui, M. (2013). Principals' Role In Promoting Use And Integration Of Information And Communication Technology In Public Secondary SchoolsIn Wareng Sub-County, Kenya [Thesis; En_ Us]. Catholic University Of East Afica.
[30] Tichapondwa, S. M. (2013). Preparing Your Dissertation At A Distance: A Research Guide. Virtual University For Small States Of The Commonwealth.
[31] Tulowitzki, P., & Gerick, J. (2022). The Role Of Ict For School Leadership And Management Activities: An International Comparison. International Journal Of Educational Management, 36(2), 133–151. Https://Doi.Org/10.1108/Ijem-06-2021-0251
[32] Unesco Office, & Regional Bureau For Education In Asia. (2016). Teachers In The Asia Pacific: Career Progression And Professional Development.
[33] Wambungu, L., & Kyalo, D. (2015). Research Methods In Education: TheoryAnd Practice. Aura Publishers.
[34] Wang, L. (2015). Research Methods In Education. Sage Publications Inc. Wu, B., & Hu, Y. (2019). Scaffolding Design Thinking In Online Stem Pre-Service Teacher Training. British Journal Of Educational Technology, 50(5), 2271–2287. Https://Doi.Org/10.1111/Bjet.12873
[35] Wu, B., & Yu, X. (2019). How Does Principal E-Leadership Affect Ict Transformation Across Different School Stages In K-12 Education: Perspectives From Teachers In Shanghai? British Journal Of Educationaltechnology, 50(3),1210–1225. Https://Doi.Org/10.1111/Bjet.12766
[36] Yator, A. (2015). Strategies For Effective Implementation Of Information And Communication Technology Among Human Rights Ngos In Nairobi. University Of Nairobi, 62