

**LEARNING MANAGEMENT SYSTEMS' CONSIDERATIONS AND
FACILITATION OF E-LEARNING IN SECONDARY SCHOOLS IN
NAIVASHA SUB - COUNTY, NAKURU COUNTY, KENYA**

NJOROGE PAUL MWAURA

D53/CE/24161/2012

**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF BUSINESS,
ECONOMICS AND TOURISM IN PARTIAL FULFILMENT FOR THE
AWARD OF MASTERS IN BUSINESS ADMINISTRATION (MANAGEMENT
INFORMATION SYSTEMS) DEGREE OF KENYATTA UNIVERSITY**

APRIL, 2024

DECLARATION

This research project is my original work and has not been presented for an award of any degree or any other study program in any other university.

.....

.....

Signature.

Date.

Paul Mwaura Njoroge.

D53/CE/24161/2012.

This research project has been submitted for examination with my approval as the supervisor.

.....

.....

Signature.

Date.

Dr. David Nzuki

Lecturer, Department of Management Science

School of Business, Economics and Tourism

Kenyatta University

DEDICATION

To my family and friends, I acknowledge your untiring support and profound encouragement in my entire study.

ACKNOWLEDGEMENT

My profound appreciation to my supervisor and all those who have given me support in this project.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	ix
OPERATIONAL DEFINITION OF TERMS	x
ABBREVIATIONS AND ACRONYMS	xi
ABSTRACT	xii
CHAPTER ONE: INTRODUCTION	1
1.1 Background of the Study.....	1
1.1.1 E-learning Facilitation	6
1.1.2 Learning Management Systems’ Considerations	11
1.2 Statement of problem	14
1.3 Research Objectives	16
1.3.1 General Objective	16
1.3.2 Specific Objectives	16
1.4 Research Questions	16
1.5 Significance of the Study	17
1.6 Scope of the Study.....	17
1.7 Organization of the Study	17
1.8 Limitations of the Study.....	18
CHAPTER TWO: LITERATURE REVIEW	20
2.1 Introduction	20
2.2 Theoretical review.....	20
2.2.1 Technology Acceptance Model.....	20
2.2.2 Technological Pedagogical and Content Knowledge (TPACK) Theory.....	22
2.3 Empirical review	22
2.3.1 E-learning facilitation in Secondary schools	23
2.3.2 ICT Expertise and E-learning Facilitation.....	26
2.3.3 Organizational culture and e-learning facilitation.....	28
2.3.4 ICT infrastructure and E-learning Facilitation	32
2.4 Summary of Reviewed Literature	36
2.4 Conceptual framework	43

CHAPTER THREE: RESEARCH METHODOLOGY	45
3.1 Introduction	45
3.2 Research Design	45
3.3 Target population	46
3.4 Sample and Sampling Techniques	46
3.5 Research Instruments	47
3.6 Research Instrument's Validity	47
3.7 Reliability of Research Instruments	48
3.8 Assumptions of Regression	48
3.8.1 Multicollinearity Test	48
3.8.2 Autocorrelation	49
3.8.3 Heteroskedasticity	49
3.8.4 Normality Test	49
3.9 Data Analysis and presentation	49
3.10 Variable Operationalization	51
3.11 Ethical Consideration	51
CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS	53
4.1 Introduction	53
4.2 Preliminary Results	53
4.2.1 Response Rate.....	53
4.2.2 Demographic Information	54
4.2.3 Age Brackets of the Respondents	54
4.2.3 Level of Education.....	55
4.2.4 School Category	56
4.2.5 Working Experience	57
4.2.6 Designation.....	58
4.3 Pilot Test of the Study Instruments	58
4.4 Validity Test.....	59
4.5 Diagnostic Test.....	60
4.5.1 Normality Assumptions Test.....	60
4.5.2 Multi-collinearity Assumption Test.....	61
4.5.3 Autocorrelation Assumption Test.....	62
4.6 Relationship between ICT Infrastructure and E-learning Facilitation	63
4.6.1 Statistical description of ICT Infrastructure	63

4.7 Relationship between LMS characteristics and E-learning Facilitation	65
4.7.1 Descriptive Statistics of LMS characteristics	66
4.8 Relationship between Organizational Culture and e-learning Facilitation	67
4.8.1 Descriptive Statistics of Organizational Culture	67
4.9 Relationship between ICT expertise and e-learning Facilitation	70
4.9.1 Descriptive Statistics of ICT expertise	70
4.10 Descriptive Statistics of E-learning facilitation	74
4.11 Inferential Statistics.....	76
4.11.1. Simple Regression of ICT Infrastructure.....	76
4.11.2. Simple Regression of LMS characteristics.....	77
4.11.3. Simple Regression of Organizational Culture	78
4.11.4. Simple Regression of ICT expertise	79
4.12 Overall Regression Model.....	81
4.12.1 Relationship between Independent Variables.....	81
4.12.2 Relationship between Dependent and Independent Variables	82
CHAPTER FIVE: SUMMARY, CONCLUSION AND	
RECOMMENDATIONS.....	85
5.1 Introduction	85
5.2 Summary of the Study	85
5.3 Conclusion.....	87
5.3.1 ICT Infrastructure and e-learning Facilitation.....	87
5.3.2 LMS characteristics and e-learning Facilitation	88
5.3.3 Organizational Culture and e-learning Facilitation	89
5.3.4 ICT Expertise and e-learning Facilitation	89
5.4 Contribution to Knowledge	90
5.5 Recommendations and policy implication	92
5.6 Suggestion for Further Research	93
REFERENCES.....	95
APPENDICES	106
Appendix 1: Questionnaire	106
Appendix 2: List of school.....	111
Appendix 3: Kenyatta University research authorization	113
Appendix 4: NACOSTI research permit.....	114

LIST OF TABLES

Table 2.1: Summary of research gaps.....	37
Table 3.1 Sampling Frame.....	47
Table 3.2 Operationalization of Variables.....	51
Table 4.1: Questionnaire Return Rate.....	53
Table 4.2: Gender of the Respondents.....	54
Table 4.3: Age Brackets of the Respondents.....	54
Table 4.4: Education level.....	56
Table 4.5: School Category.....	56
Table 4.6: Working Experience in the Secondary Schools.....	57
Table 4.7: Designation in the Secondary Schools.....	58
Table 4.8: Reliability Analysis.....	59
Table 4.9: Validity Test Results.....	60
Table 4.10: Normality Assumption Test Results.....	61
Table 4.11: Multi-collinearity Assumption Test Results.....	62
Table 4.12: Autocorrelation Assumption Test Results.....	62
Table 4.13: Relationship between ICT Infrastructure and E-learning Facilitation.....	64
Table 4.14: Relationship between LMS characteristics and E-learning Facilitation...66	
Table 4.15: Relationship between Organizational Culture and e-learning Facilitation	68
Table 4.16 Relationship between ICT expertise and e-learning Facilitation.....	71
Table 4.17: Descriptive Statistics for E-learning facilitation.....	75
Table 4.18: Correlation between ICT Infrastructure and E-learning Facilitation.....	76
Table 4.19: Correlation between LMS characteristics and E-learning Facilitation.....	77
Table 4.20: Pearson correlation.....	78
Table 4.21: Pearson correlation.....	79
Table 4.22: Relationship between Independent Variables.....	81
Table 4.23: Model Summary.....	82
Table 4. 24: Relationship between Independent Variables.....	83
Table 4.25: Relationship between Dependent and Independent Variables.....	83

LIST OF FIGURES

Figure 2.1 Conceptual framework	44
---------------------------------------	----

OPERATIONAL DEFINITION OF TERMS

E-learning facilitation	Enabling learning through electronic means by use of ICT. Using computers and the internet to support learning and make it effective and better
ICT Expertise	The ability to use networks and communication technologies, in teaching and learning; word processing, spreadsheet, database, power-point and search engines
ICT Infrastructure	Having the e-learning facilitation enablers; power availability, computing devices, internet connectivity and furnished computer laboratories
Learning Management Systems Characteristics	Software application in educational courses automation of school programmes, documentation, delivery of educational courses, tracking, reporting, training programmes, ease of use, and ease of training, robustness and interoperability
Learning Management Systems' Considerations	A deliberate and well thought out usage of Learning Management Systems to enable e-learning facilitation
Management Information Systems	These are information systems used by organizations for, analysis, decision making, coordination and conception of organization information
Organizational culture	Institution's established beliefs, values and culture, which shapes perception, opinion and understanding of a work system leading to: Higher performance, social intelligence, good communication and great leadership

ABBREVIATIONS AND ACRONYMS

ESP	Economic Stimulus Package
GOK	Government of Kenya
HEIs	Higher Education Institutions (HEIs)
ICTs	Information Communication and Technologies
KICD	Kenya Institute of Curriculum Development
LAN	Local Area Network
LMS	Learning Management Systems
MoE	Ministry of Education
NACOSTI	National commission for Science Technology and Innovation
OECD	Organization for Economic Co-operation and Development
TPACK	Technological Pedagogical and Content Knowledge
TPAD	Teachers Performance Appraisal and Development
TSC	Teachers Service Commission
WAN	Wide Area Network

ABSTRACT

E-learning has myriad of benefits to secondary schools; to teachers, students and administrators; it improves teaching and learning, it's interactive and convenient among other benefits. Thus, the need for considering Learning Management Systems, to aid e-learning facilitation. LMS's allows schools to manage and deliver e-learning. The e-learning facilitation in academic programmes has been a challenge to many institutions in Kenya and specifically in Naivasha Sub-County due to the associated issues. The purpose of this study aimed at assessing the influence of Learning Management Systems on e-learning facilitation in secondary schools in Naivasha Sub-County, Nakuru County, Kenya. The study determined the effects of; ICT expertise, ICT Infrastructure, LMS characteristics, and organizational culture on e-learning facilitation in secondary schools in Naivasha Sub-County. This research adopted Technological, Pedagogical and Content Knowledge Theory (TPACK) and Technology acceptance model (TAM) which assisted when assessing influence of the independent variables on facilitation of e-learning in secondary schools in Naivasha Sub-County. Descriptive survey design was used for the study. The respondents comprised of head of institutions and teachers. A sample of 259 respondents was derived for the study from the population of 806 secondary schools using stratified random sampling technique in Naivasha Sub-County which are categorized into; Extra County Schools, County Schools, Sub-County Schools and Private Schools which samples were drawn for each category. Closed-ended questionnaires were used to collect data from respondents; teachers and heads of institutions. A pilot test was executed to test questionnaire's reliability. The study made use of Cronbach's Alpha coefficient for the research instrument's reliability determination. Data analysis made use of descriptive and inferential statistics for analysing data reinforced by SPSS statistical package to compute standard deviations, means, frequencies and percentages. Regression analysis was also engaged for determination of the influence of independent variables on the dependent variable. Data presentation was done using tables and figures. Descriptive and inferential statistics were used to analyse data and describe the relationship between independent variables and the dependent variable. The research findings may be used to make recommendations with an aim of improving the status of e-learning facilitation in secondary schools in Naivasha Sub-County Kenya. The possible beneficiaries of the outcome of the study includes the school management, researchers, MoE, policy makers and secondary school teacher. The study established that ICT infrastructure, LMS Characteristics, Organizational culture and ICT expertise were significant determinants of e-learning facilitation in secondary in Naivasha Sub-County, Nakuru County, Kenya. The school administrators and teachers in secondary schools, should be keen about considering the ICT infrastructure, LMS characteristics, Organization culture and ICT expertise when executing their mandate in regards to e- learning facilitation.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Learning Management Systems' considerations on e-learning have seen tremendous growth and popularity in the recent past. This has outstandingly changed the way the institutions carry out teaching and learning. It has impacted training and educational needs, both in terms of educational content creation and educational training services delivery. LMS have provided students with a learning process corresponding with their needs. LMS benefit teachers with training tools enabling varying skills in levels of learning processes, offering more chances in enabling teaching and learning and adapting to individual learners needs (Varchenko, 2021). Learning Management Systems have enabled e-learning making teachers to shift from the conventional way of learning and teaching.

Learning Management Systems encompasses use of technologies which are web-based and assists in acquisition of knowledge and sharing of learning materials. In addition, LMS assists instructors to send learning materials and follow up on evaluation of students' and assist learners to have interaction with tools of learning in their web based education (Liu, 2015)

According to findings by Adejobi & Ibrahim, (2015) in the USA, out of five children under the age of 18, three of them study online. More than 78 percent of children in the age brackets of 12 and 17 also study online. They use the Internet to interact with tutors and classmates, researching project work, doing tests and quizzes, lesson observation and giving class notes. Learners see the internet as a device or a way for keeping their key learning materials and as a means to move their papers and books from one place to the other. To keep track of their assignment, notes, class schedule, syllabi, and revision papers, learners depend on the internet (Theeraroungchaisri, 2013).

In the USA from 2009 to 2010, district public schools numbers with courses in distance education went up to about 53 percent in number (Institute of Educational Sciences, 2014) there were slightly over 300,000 new distance learning admissions Between 2004 and 2005 which shot to over 1.3 million high school admission between 2009 and 2010 and a one million new admissions (Institute of Educational Sciences, 2014).

In different research study, number of learners with computer access ranges from 75 percent in Italy to 90 percent in Canada, New Zealand and Finland. Some countries in Asia; Thailand, Indonesia and India were seen to have understood the significance of ICT incorporation in their system of education. In addition they are also creating network connections for schools and financing ICT infrastructure in the education institutions (Mikre, 2011).

In 2010, the Indian government, commenced a great program meant to generate computer laboratories with access to internet for; online library, academic learning, academic learning and web-casting covering sixty thousand schools across the nation (Kabundula, 2017). All the cited research point to a bright picture of the far the first world countries have gone in e-learning implementation and the benefits that students and teachers got from the same.

Albeit slowly, developing countries are catching up in matters ICT connectivity. The taking up and use of LMS in schools in developing countries specifically in Africa remain very limited despite the attempts to invest in information and communication technologies (Apulu, 2012). For e-learning facilitation to actualize, information communication technologies are a requirement. ICTs such as; computers, local area network and internet. Many of African countries are however yet to procure needed ICT's required for e-learning facilitation in educational institutions.

Lack of ICT's inhibits shifting from usual traditional classroom teaching to e-learning in many schools in Africa. According to Global Information Technology report by (Tedla, 2012), on ICT readiness survey of 134 economies, Tunisia, Mauritius and South Africa were ranked positions 38, 51 and 52 respectively. Many North African countries have made noteworthy advancement in ICT adoption because of the bandwidth connectivity that they share with Europe and their financial ability. Ghana, Botswana and Cameroon are other nations that are prioritizing application of ICT in their schools. In Ethiopia's system of education the usage of ICT mainly the internet and computers is quite limited despite having crystalline policy direction. The cognizance, establishment and preparation to computer use and the internet for learning appears likely to be happening (Alemu, 2015).

Olukotun (2013) noted that the major type of e-learning implemented in schools in Nigeria was storing teachers' lesson notes in CD-ROM as learners would re-play any time they wished to. In Nigeria, there were limited learning institutions that had embraced digital education. Green springs School in the state of Lagos was among the schools in Nigeria that were first in offering their learners with such technology in learning and it unquestionably made learning and teaching more fruitful and rewarding. In another study done in state of Ekiti in Nigeria, Adeyemi & Olaoye (2013) concluded that many schools in state of Ekiti lacked Information Communication and Technology facilities and equipment. Despite of a sizable number of schools having computers and printers, they lacked projectors, fax machines, screens and scanners. This is a sign that ICT materials provision in the schools is insufficient and it confirms that the country's leadership is not totally equipped to expedite adoption of information communication and technology in schools.

In a related study done in Lagos University in Nigeria, Okiki (2011) recorded impediments of e-learning experienced in Africa: illiteracy among the students, unreliable power, expensive ICT hardware, poor telecommunication infrastructure, high import tariffs, high cost of acquisition and installation of the gadgets required for e-learning, limited skilled manpower, restricted bandwidth and transmission cost. As shown in different research studies, the picture is almost similar in most African countries. Bottleneck to e-learning facilitation varies in small degrees; lack of resources, policies, goodwill and ICT illiteracy.

To better learning and teaching, e-learning adoption comes in handy because learners cultivate good communication along with personal skills. For instance; analytical and intellectual skills, self-sufficiency among others (Tunmibi, Adejobi & Ibrahim, 2015). In a research by Kidombo, Gakuo & Kindachu (2011) they resolved that incorporation of ICT in the delivering of curriculum and developing in high schools in Kenya was determined by; school's ICT plan availability, school manager's level of ICT expertise, the schools' leadership and availability of ICT skilled teachers.

Kisirkoi (2015) reported that, regardless of the determination by the Kenyan government and the seeming will to support ICT as an instructional tool, the needed progress had not been achieved. He further noted that the Ministry of Education relaxed ICT integration in programmes and operations was noted as a part with key weakness in the Ministry of Education.

The fundamental problem is that Kenya lacks sufficient network infrastructure and connectivity. Even though a small number of schools mostly private and international schools can easily access high-speed connectivity from reliable internet service provider. In the low-income parts there is in most cases limited access to national

communication infrastructure. Subsequently, there is inadequate access to dependable high-speed internet connectivity that can be depended on for e-learning.

As a new approach, most Kenyan public secondary schools have made an attempt to adopt e-learning in instruction and learning in the last few years. However, the impediments to e-learning execution met by these institutions have sustained the negative impact on e-learning effective application (Gichoya & Muumbo, 2015). Computer anxiety among users in learning in institutions in Kenya was found to have negatively affected LMS adoption (Ngamau, 2013).

To confront these bottlenecks, learning institutions must incorporate appropriate e-learning ICT tools, the novel LMS technologies and work towards changing the traditional in classroom way of teaching to e-learning. It will aid in transforming; the learning and teaching processes and the curriculum in order to arm students with skills for efficient functioning in this vibrant and ever shifting technology related environment.

The Government of Kenya is committed in having high quality of life in Kenya and be globally competitive as proposed in Kenya Vision 2030. To realize these goals, it is imperative that the education sector contributes majorly. Technology, specifically Information and Communication, has a chief part in ensuring education meets its objective and delivers its mandate. The government of Kenya takes into consideration that a workforce with ICT expertise is key in ensuring that Kenya attains the big four agenda by 2030 and attaining the status of a knowledge economy.

A National Information & Communication Technology strategy was established in 2006 January by the government to better the Kenyans livelihoods by having ICT services that are; affordable, reliable, efficient, and accessible (Kibukho, 2015). If this went as planned, many schools throughout the nation would currently be in a position

to facilitate e-learning. The policy's major aim was to improve learning and teaching by having high schools, colleges and universities use ICT. In 2011 the government of Kenya was determined to commence e-learning in several public high schools. Through the MOE the government focussed on five high schools from every district where e-learning implementation was set to undergo execution. Under the Economic Stimulus Package MoE (2011) a sum of ksh.980 million was set aside for the development of ICT infrastructure. The funds set aside were meant to was to buy computers accessories, projectors; fund internet connectivity, local area network, and training of teachers. A mandate had been given by the government to KICD to deliver e-learning digital content .The project's purpose was to confirm the viability of programs of e-learning in schools in Kenya.

However all these efforts notwithstanding, e-learning is still on its knees as was exposed after the recent shutting down of schools. In the recent past, the key infrastructure that has been put in place include; facilitation of experimental development of telecommunication industry; the placing of the fibre optic cable throughout Kenya, construction of Konza techno city which unfortunately never saw the light of the day as had been projected. Even with such efforts from the government a decade down the line, the pandemic caught us pants down and learning was totally discontinued and many learners (mostly from public schools) stayed for months without being taught by teachers and with no online platform to continue with learning.

1.1.1 E-learning Facilitation

E-learning is a fresh shift in the sector of education in a determination of knowledge base advancement. The start of 21st century has prefigured the scholastic technology that has led to facilitation of e-learning in many post primary and tertiary institutions in

the third world countries. (Fayomi O. 2015).E-learning is significant, key and an effective method that should be amalgamated with daily activities of teaching and learning (Jahjough, 2014). E-learning supports teachers and students in learning by use of various Learning Management Systems (M.Sabani, 2019).

In the near past, adoption of LMS for assisted e-learning in institutes of higher learning in countries that are developing has escalated causing a systemic change from the normal learning and teaching to e-learning (Omwenga, Hadullo & Oboko, 2017). This points why education in western countries has always been better and progressed compared to education in developing countries.

Schools in the western countries have developed ICT infrastructures in the last twenty years, enabling the learners use computers more often and in many applications (Volman, 2015).

Research has proven that there is a one on one association between learners' performing well in studies and LMS usage during e-learning. For instance, Komis, Filippidi, and Tselios, (2010) assessed usage of Moodle on the learners' performance in Patras university in Greece. It was evident that LMS use had significant positive outcome on performance of students, leading to 20.2 per cent variance in their summative grade. The research conclusions are akin to a research study done by Yoon Kim and Jo (2014) at the Ewha women university. The researchers concluded that constancy of utilization was key in indicating and explaining performance of learners for the courses offered by way of LMS. LMS usage in e-learning in post primary schools in emergent nations like Kenya is still a pipe dream because of poor or total lack of ICT infrastructure attributed to high cost e-learning cannot occur in a void; it has two key requirements: presence of the appropriate infrastructure and internet connectivity (Mallampalli, 2020).

The unindustrialized and undeveloped nations are still not enjoying the benefits of e-learning mainly because of absence of reliable internet and key ICTs. The cost of personal computers and laptops enough for students are still very high considering the large number of students in high schools in Kenya. Many parents with children in public secondary schools earn little salaries and therefore cannot afford to buy their school going children laptops and smart phones necessary for e-learning. Although some schools have computer labs furnished with computers and well connected with internet and some of the student and teachers have no knowledge to operate computers thus they shy away from using them. Internet installation cost is still very high in Kenya. Few students use their parents' smart phones while the majority make use of cyber cafes where they are charged between ksh.50 to ksh.100 per hour which is quite expensive. In most the time the internet is slow hence unreliable.

Parents' illiteracy is another major issue that faces learners from the rural areas whereby parents are unable not assist their children adapt to the novel L.M.S technologies. On such occasions, the learners aren't inspired to work hard and put effort in learning and attendance of classes because some fail to see its value (Sheridan et al., 2020). Most secondary school students lack prior information on ICTs and knowledge since neither was it engrained in the curriculum at the elementary and primary level of their education nor are there computers in their homes. Thus, they find it hard to adapt and adopt its usage within the four years of secondary education. Similar issues were faced in Malaysia: limited e-learning platforms, unreliable internet connection, lack of vital online platforms and tools for learning, and little e-learning interest from the learners (Noraini & Ahmad, 2021). It is much costly to acquire some of the requisite LMS software since they are not locally engineered. Mostly, in developed countries like China the set systems are intended to suit them and eventually enrich their own

development. Challenge in ease of use in some software is a discouragement and a hindrance to some students and teachers who may express interest in ICT usage.

In a study by Jorden et al. (2021) he identified issues such as; limited LMS knowledge from instructors, lack of or limited internet connectivity and low quality e-learning teaching resources. There are few technical staff in the secondary schools to run and handle learning management systems. This makes it very expensive and challenging for schools that have computers in case of technical challenges. Although there has been tremendous connection of electricity countrywide, there are some rural areas that are still not connected. Electricity connection is still expensive and not affordable by all secondary schools (Kirimi, 2014).

Many secondary schools in Kenya are characterised by few available learning and teaching materials like books common in most secondary schools across Africa. In developing countries larger classes are common in the schools leading to high teacher student ratio, shortage of instructional materials and poor physical infrastructure can efficiently be taken care of by use of multimedia teaching aids (Waita, 2016). LMS aids e-learning which cure the problem of learners missing lessons. Learners look forward to school and the learning is motivating, captivating and interesting. Such motivation may minimize dropping out of school by students (Qamar K. 2021).

To overcome the problems related to geographical isolation e-learning comes in handy particularly for learners in far-flung areas. Students from areas that are still affected by tribal clashes and floods, can still learn online from homes. Teachers and students can continue interacting and learning continues. In many schools in developing countries learning and teaching materials are very inadequate; LMS can be of benefit by ensuring teachers and learners do get the necessary recent e-content and online learning resources (Alhajiri, 2021). LMS's provide learner-centred curriculum applications with

an environment that is a learner centred enabling the learners to customize their own experiences in learning.

The Kenyan government takes education as the expected platform for providing the nation with ICT expertise so as to generate an economic growth that is vibrant and viable (Muliaro, 2017). Other than the conventional ICTs use in education meant to improve the school management processes and the school curricula in existence, the government of Kenya via the Ministry of Education, suggests that the ICT use in education and institutions of training will be of chief value in extending skills to the other part of the society thus creating positive influences to the economy.

Facilitation of e-learning is very vital as it enhances efficiency among instructor and learners as well as make strides the conveyance of the substance within the educational programs (Kinshuk, 2014). In the long run, better education translates to a better country and better citizens.

Naivasha Sub-County schools benefited from a recent country wide training on use of remote technologies by teachers service commission. Two teachers from each school benefitted from the two day training. The primary goal of the program, which began in July 2021, and aimed at running annually, is to make it easier for learners to transfer their knowledge even when they are in various locations by using a variety of mediums, including computers, radio, television, and video conferencing, among other cutting-edge technology. Secondary Schools that have well established information communication technologies are well suited to implement e-learning (Mahmud R. 2017). However even with the knowledge on use of remote learning technologies, ICT technologies which are key in ensuring e-learning facilitation may still be limited.

1.1.2 Learning Management Systems' Considerations

Learning Management Systems' considerations are deliberate and well thought out usage of Learning Management Systems to enable e-learning facilitation. Software application in educational courses, automation of school programmes, documentation, delivery of educational courses, tracking, reporting, training programmes, ease of use, and ease of training, robustness and interoperability (K. Salameh, 2019).

LMS' considerations offers space for e-learning that uses internet networks, intranet, and internet plus extranet to proliferate teaching resources and enable other administrative undertakings associated with teaching and learning. Moreover, LMS ensures that learners establish their teaching methods to accustom themselves to the learning process so as to fit in their personal needs (Liu 205).

LMS' considerations majorly entails the usage of web-centred technologies for knowledge acquisition and distribution. LMS is a key tool that offers e-learning platform that uses extranet, internet, intranet, and networks to roll out support of learning resources and other administrative activities associated with learning and teaching.

In an education context specifically, Learning Management Systems creation depends on the desire and need of teachers to monitor learners performance, manage their 'online classroom learning path so as to create and to roll out teaching content with an aim organizing e-learning undertakings, for evaluation, collaboration, provision of tools of communication and interaction among learners (Dias, Diniz, & Hadjileontiadis, 2014).

This implies that LMS's are beneficial technologies to teachers as they can be used to customize their own physical classroom teaching lessons to online learning, records keeping, administrative needs, writing reports, online teaching and learning

undertakings, and to provide training materials for their learners, furthermore Abdelraheem (2012) and Gedera (2014) were of the same opinion that, LMS e-learning platforms are flexible technologies as they assist in; course content submission and course information management required by teachers when conducting online classes. LMS's offer great environment enabling virtual teaching and learning, which is autonomous and free of time and space limitations (Konte, 2018).

According to Greenstein (2012) proficiency of ICT involves not just perfecting of technical skills and techniques, but also understanding how to purposely apply these skills, dutifully and securely in learning, in daily living and in employment. Hence, students and teachers who mainly interact with platforms of e-learning should have e-learning managerial skills and the required technical experience.

Usage of e-learning by students can be stalled by their lack of technical knowledge (Almaiah, 2020). With lack of necessary ICT skills, students may shy away from ICT due to low self-esteem. Having the right skills will give the learners confidence and motivation to learn more and more.

The major ICT infrastructure that stimulate e-learning in secondary schools include: digital content, smart boards, internet connectivity, computers, local area network and projectors (Ondigi, 2021). Power connectivity and trained teachers with computer skills are also key in enabling e-learning facilitation.

Sustainability of the e-learning programme should be considered as the programme needs finances to sustain. School principals need to include such costs in the budget. A good project should be futuristic and not just short term. Mingaine (2013) pinpoints a number of restrains that deters effective technology implementation by schools in some parts of Africa as; inadequate ICT facilities, insufficient teachers, financial limitations, undependable electricity and lack of ICT skills. Absence of tangible educational

facilities, like classroom buildings are also key challenges encountered when making resolutions on implementation of ICT.

Athauda (2016) opined that before ICT implementation, other than the virtual computer laboratories, there needs to be physical facilities like computer laboratories. Conversely, in a lot of schools in impoverished nations like Kenya, there is usually no distinctive computer rooms or appropriate buildings put in place (Tondeur, 2015). Heads of these institutions have a challenge of building computer laboratories due to their high cost.

In addition, implementation of ICT also necessitates extension cables, computer desks and maintenance cost which most schools in developing countries are incapable of affording.

Crucial factors supporting facilitation of e-learning include individual willingness and the instructor's attitude toward using technology in the classroom (Lally, 2017). The teachers' attitudes are the most important, regardless of funding, as they are the main implementers. Teachers can persuade the administration to agree to support e-learning programs and can successfully convince students to adopt e-learning facilitation. In arrange for e-learning appropriation to be fruitful, it is vital for clients to acknowledge innovation as an instructing and learning medium in expansion to the fundamental foundation and client abilities (Mingaine, 2013).

E-learning is best facilitated when students and teachers have positive attitudes and perceptions about technology. Teachers with ICT expertise, skills, or the capacity to acquire them need a positive attitude as the driving force and motivator. Many teachers believe that e-learning is alien, and some of them believe that technology has robbed them of their normal influence over their courses (Balle, 2018). With such negative attitude, any effort to facilitate e-learning will be watered down by the teachers. Hence,

on top of acquiring ICT infrastructure, it is important to check the users' perception and technical capability towards technology to establish degree of readiness to of e-learning facilitation.

1.2 Statement of problem

One of the tactics to attain the Kenya Vision 2030, and place Kenya in the global map as a digital economy that's aimed at transforming Kenya into a middle industrial economy and a hub for ICT is to embrace ICT in training and education, (The National ICT Master Plan, 2014-2017)

In reference to Kenya's Ministry of Education MoE (2021) policy on ICT in education and in training, the Kenyan government has committed to invest heavily in education via allocating cash in the budget to guarantee quality education that is quality relevant, rightful and available to all Kenyans. It is admitted that for the said restructured measures to be a success, Information Communication Technologies (ICTs) will be a key fundamental role in the delivering of worthwhile education. Therefore the administration of Kenya has vowed to continue investing in ICT's in training and education.

In research study carried out Joab Kinzi (2017), on Impact of the enactment of Information and Communication Technology Program for public high schools in Naivasha Sub-county, Kenya, he suggested further studies to be carried out on other factors influencing ICT in public secondary schools in Naivasha Sub County. Another research study done by Ngugi Peter (2015) on extent of use of ICT in management of education, suggested further studies to be carried out on challenges facing e-learning in high schools in the Sub County of Naivasha.

There are myriad of advantages in facilitating e-learning in high schools. Learners can be able to study solely and do personal research, making learning more learner centred.

In cases where the teachers are absent and are physically unavailable, learners are able to contact the teacher and vice versa. The LMS use in education has a high chance of improving; the level of learning and teaching, teachers and students productivity, effectiveness of institution and school management (Kasim, 2016).

According to a research, e-learning execution in schools in Kenya aided by LMS enhances students' motivation, understanding, active interaction with e-learning support, access to the needed ICT information (Mamari, 2019). E-learning is swift and effective hence saving time, queues in the libraries are lessened; online research can be carried out by students thus offering updated information happening worldwide. Nevertheless, despite all the advantages and benefits of online learning, researches above have illustrated that e-learning may not be completely embraced in numerous schools in Kenya. In schools where ICT framework are accessible, instructors restrain its utilization in; examinations writing, analysis of examination results, utilization of emails and logging in to TSC websites, filling in of T-pads, preparing lesson plans but not in e-learning. Learners who take ICT as a subject have not enjoyed the benefit of e-learning.

In other cases some students use computers and smart phones to play games and sometimes for communication but not for learning. A research by Abonyo & Manduku (2012) shows that although ICT implementation has to a far extent been actualized and incorporated by many sectors; communications, health, housing, transport and banking, LMS adoption in education sector majorly the schools appear to be lagging behind.

This research aimed at examining LMS' considerations on e-learning facilitation in high schools in Naivasha Sub-County, as there was no current documented evidence of an existing research study done in that area in order to make recommendations that would enhance e-learning facilitation.

1.3 Research Objectives

1.3.1 General Objective

The study sought to establish the influence of Learning Management Systems' considerations on e-learning facilitation in secondary schools in Naivasha Sub-County, Nakuru County, Kenya.

1.3.2 Specific Objectives

The study sought to:

- i. Assess the relation between ICT infrastructure and e-learning facilitation in secondary schools in Naivasha Sub-County.
- ii. Evaluate how LMS characteristics affect e-learning facilitation in Secondary schools in Naivasha Sub-County.
- iii. Examine the effect of organizational culture on e-learning facilitation in secondary schools in Naivasha Sub-County.
- iv. Determine the influence of ICT expertise on e-learning facilitation in secondary schools in Naivasha Sub-County.

1.4 Research Questions

- i. What is the relationship between ICT infrastructure and e-learning facilitation in secondary schools in Naivasha Sub-County?
- ii. How does LMS characteristics affect e-learning facilitation in Secondary schools in Naivasha Sub-County?
- iii. What is the effect of organizational culture on e-learning facilitation in secondary schools in Naivasha Sub-County?
- iv. What is the influence of ICT expertise on e-learning facilitation in secondary schools in Naivasha Sub-County?

1.5 Significance of the Study

This study's findings will be valuable to teachers in secondary schools mostly in Naivasha and also in the whole country.

Teachers will acquire knowledge in Learning Management Systems' Considerations and e-learning facilitations that they will use to improve their teaching and interactions with students.

School administrators will also acquire knowledge of how to use LMS' necessary for managing institutions and to better learning by e-learning facilitation.

Moreover the findings of the study will benefit the Ministry in charge of education as their plan on policies meant to better education in various counties.

Scholars and policy makers will also benefit with knowledge of systems of learning Management and e-learning facilitations.

1.6 Scope of the Study

This study was carried out in secondary schools in Naivasha Sub-County. This Sub-County is one of the eleven Sub-Counties of the larger Nakuru County. This study, targeted the heads of institutions and teachers in the secondary schools.

The Sub-County has 61 secondary schools and 806 teachers out of which a total of 259 respondents were sampled for the purpose of the study. 18 heads of institutions (30 percent of 61) and 241 teachers (30 percent of 806) from secondary schools in Naivasha Sub-County.

1.7 Organization of the Study

This study comprises of five chapters. The first chapter of this study encompasses of the background of the study, where the views of similar researches done on Systems of learning Management and e-learning facilitations have been discussed from a global

view cascading through regional researches to the local studies. Dependent and independent variables have also been discussed. Statement of research problem has been supported with current document evidence. Objectives of the study; general and specific plus the research questions have been discussed and are also highlighted in chapter one. The scope of the study, the significance of study, a limitation of study and the organization of study are all in chapter one.

The second chapter highlights theoretical, and empirical reviews. Theoretical reviews shows how the two theories have been linked to the variables. Empirical review showing researches related to the variables is also in chapter three. A conceptual framework showing the relationship between independent and dependent variables is illustrated in Chapter two.

Chapter three contains the research methodology under which the research design, target population, sampling design, the research instrument, pilot testing, validity of the research instrument , reliability of research instrument , data analysis , variable operationalization and ethical consideration.

Fourth chapter of the study comprises of the study's findings from the analysed data the findings have been presented in tables and well augmented by discussions and reviews. The fifth and final chapter does contain the summary of the findings, conclusion and recommendations by the researcher plus areas suggested for further studies.

1.8 Limitations of the Study

Even though it was anticipated that the research objectives would be successfully achieved, there were several limitations that were encountered. The first limitation encountered during this study was that the head teachers and school managers were hesitant to allow the researcher to issues questionnaire to teachers during working

hours. However, this was overcome by researcher presenting the heads and managers with the approval letters from Kenyatta University and NACOSTI. The explained importance of the research was also convincing. Heads allowed research albeit with strict time limits thus overcoming the challenge.

Another limitation was that a few teachers were unwilling to fill in the questionnaires as they thought it was time consuming while others felt not confident enough to answer technology related questions. However upon viewing the easy to answer format of questions structuring, the teachers complied. The researcher also convincingly explained the importance of carrying out the study.

The data captured only portrays the situation in Naivasha Sub County but the scenario might be deferent from other sub counties. And counties. The researcher overcome this challenging limitation by suggesting that similar researches to be done in other Sub counties.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter starts by highlighting two theories that are in support of the research problem. Secondly, an empirical review on similar research on; LMS Impact and benefits of facilitation of e-learning in secondary schools globally, regionally and locally, hindrances impeding e-learning facilitation globally, regionally and locally (I.C.T expertise, organizational culture and ICT infrastructure). The findings of the researchers plus the gaps noted have also been explained under each subsection. Finally, there is a conceptual framework depicting association between criterion and predictor variables and indices of specific variables.

2.2 Theoretical review

The choice of the TAM theory has been informed by the establishment by researchers who have concluded that the technology acceptance model (TAM) has been a very useful theory in elucidating the acceptance transformation of digital technology This theory describes and demonstrates how people in various sectors of the society have come to accept and use specific technology (Al-Marroof & Al-Emran, 2018). Technological Pedagogical and Content Knowledge, model (TPACK) offers a new integration outline of technology in education and how one can organize institutions of learning to offer the best educational practice for learners by incorporating technologies like LMS.

2.2.1 Technology Acceptance Model

This research will adopt Technology acceptance model (TAM) that models how a technology is eventually accepted by users. This model was advanced originally by Richard Bagozzi and Fred Davis (Davis & Warshaw, 1992 Davis 1989 and Bagozzi).

It mostly entails the prediction of Information System acceptability. The theory will model how the facilitation of e-learning will be enabled by independent variables; ICT infrastructure, ICT expertise and LMS' considerations.

The model's main intention is the tools acceptability, predictability and its modifications identification which, so as to make a technology acceptable to the user, must be incorporated to the system. Electronic learning encompasses usage of computers and internet by both the learners and teachers (Alenezi, 2020). To newly introduce e-learning and embrace it, the users must first accept it as a system that will bring benefits and positive change. The organizational culture of the schools will determine its acceptance of e-learning facilitation. If the users' perception is negative from the onset, they may never put any effort to accept or adopt it. This model does suggest that an Information System acceptability (Facilitation of e-learning) is bent on two key aspects; the supposed effortlessness of use and its perceived effectiveness.

Teachers must see how facilitating e-learning will improve their teaching. Students on the other hand must perceive the new system as a tool to make their learning more interesting and better. The extent and degree to which users believe that usage a certain system will be effortless and easy depends on the perceived ease of use. The study will also establish cognizance of the ease of facilitating online learning in schools (Arunachalam, T. 2019).

The model's main intention is the tools acceptability, predictability and its modifications identification which, so as to make a technology acceptable to the user, must be incorporated to the system. Electronic learning encompasses usage of computers and internet by both the learners and teachers. To newly introduce e-learning and embrace it, the users must first accept it as a system that will bring benefits and positive change. The organizational culture of the schools will determine its acceptance

of e-learning facilitation. If the users' perception is negative from the onset, they may never put any effort to accept or adopt it. This model does suggest that an Information System acceptability (Facilitation of e-learning) is a determinant by two major factors; its perceived effortlessness of use and its perceived helpfulness.

Ease of using computer, internet and e-learning in general. Teachers and students would want a system that will be possible to use without much difficulty. A system that simplifies but not complicating learning and teaching. (Hortsch, M. 2020).

2.2.2 Technological Pedagogical and Content Knowledge (TPACK) Theory

This theory was advanced at Michigan State University in 2006 in by Matthew Koehl and Punya Mishra as a way of explaining teachers' understanding level needed for effective ICT usage in teaching. This theory, explains that instructors require pedagogical, content and technological know-how as opposed to only requiring the rudimentary skills in computer literacy in order to enable successful ICT use in their work of teaching (Mishra & Koehler, 2006). To realize and actualize facilitation of e-learning teachers need to have more than the basics of ICT e-learning encompasses quite a number of things, for instance for a teacher to carry out an online class, he/she need skills on e-learning platforms and handling of software. The learners too need to have the required ICT skills for both teams to actualize e-learning in the school. (Gulliver, S. R. 2021). This theory assisted when assessing influence of independent variables; ICT expertise, ICT infrastructure and LMS' considerations on facilitation of e-learning in secondary schools in Naivasha Sub-County.

2.3 Empirical review

Electronic learning is learning supported by electronic resources whether used exclusively as in distance learning situation or complimented with face to face instructor led (Anyim W.O 2021). Phone gadgets can help aid e-learning although it

may not be as interactive and as efficient. Radios through education programmes also offer e-learning and although they too are not interactive. Advanced e-learning is supported by e-learning platforms: blackboard, Moodle, OLAT, desire2learn WebCT zoom etc. An e-learning platform is a comprehensive software package that supports; course preparation, content delivery, and interaction of teachers and students, and permits accessibility of these aspects through a network (Puliaieva 2020). A good course supported system is able to transmit course content to learners, evaluate learners, create class discussion and computer based instructions and facilitate students and instructors to communicate with each other.

2.3.1 E-learning facilitation in Secondary schools

Micha R. (2019) in his study on the current and future state of LMS, opines that LMS can do away with isolation of teachers, removal of classroom walls, linking them to other teacher, authors, publishers and curriculum drafters through the internet. This facilitates and advances teachers' professional advancement. Moreover, teachers are empowered to keep up with development happenings globally. Use of e-learning with the assistance of LMS guarantees that teachers and students are always informed.

Faboya (2017) posits that ICTs can ensure teachers attain these prospects by; accessing academic information, productivity tools and beneficial opportunities. With online meetings, the number of staff meetings decreases. Most information is passed by heads of institutions to teachers through Microsoft teams, whatsApp messaging leading to cutting down physical staff meetings hence saving time. Teachers can use the salvaged time to attend to other professional duties. However the research does not include advantages of e-learning to students therefore leaving a gap.

The practice of imitating a real phenomenon is referred to as simulation; e-learning enhances computer simulation programmes. According to Kazimova (2017) in his journal; *Learning English with simulation*, concluded that; Simulations permits learners to try out vocabularies and structures of sentences and gives students the chance to do assignments or tackle academic issues together. Learning of English is made much fascinating by simulation and especially when done with computer simulation games. With their impressive interactivity, real-like animation, intricate scenarios, the computer simulated games make available online environments for learning of language that is richly contextualized. The research however specifically targeted English learning and not any other subject.

Zaini (2018) in her research; *Word Processor as Monarch*, learning word processor helps in; document and text input, creation, editing and production by means of computer systems. By allowing them to adjust materials of teaching instead of having to create new ones all the time, word processing ensures time saving by teachers. To ensure documents sharing such as class notes from teachers to students using word and excel applications comes in handy. Compared to handwritten the created work is more legible and alluring. With success in e-learning facilitation examinations in high schools especially in under-developed nations should be carried out online like it is happening in developed countries. However other than word processor, other computer application like excel and PowerPoint are equally important to learn to enhance e-learning facilitation.

In a recent research carried out in India by Dhawan (2020) a remedy in the period of Covid-19 crisis. The pandemic situation challenged the education system across India as it disrupted learning forcing most schools to shut down. This made educators to quickly switch to online mode of teaching. Various teachers and learners that were

already unwilling to alter from conventional educating fashion were constrained to completely alter to online learning and educating (Bulacra M.C 2020). It was however challenging because institutions of learning; high schools, colleges and institutions of higher learning in India were mostly established singly on conventional in-classroom face to face method of learning. When most schools were forced to close down the only platform left for learning was online. However the researcher did not explain how the schools were able to make a quick shift as e-learning requires infrastructure and technical logistics that would take a long time to facilitate .Other than the schools that had earlier been practicing online learning, In most cases it is only private schools that were able to shift to online teaching within a short time (Kundu, 2021).

With e-learning, learners can study anytime, anywhere with an advantage of a lot of savings on travelling and housing, particularly owing to usage of various exploration platforms like google or quick online knowledge access Bej, 2021). E-learning removes physical barriers that can be brought about by natural calamities and any unseen eventuality like covid-19 pandemic.

E-learning can make it much easier to access the teachers away from the normal working hours, for instance by web-based or e-mail forums of discussion. In day schools, learners can continue learning at home after breaking for home in the evening, sick and disabled learners can able to continue learning and receive instructions from the teachers from the comfort of their homes.

In a study done by Arifin, Mathematics Creative Thinking Skills, e-learning has the ability to have the interest of the learners by bringing back learners' curiosity back to education (Arifin, Suyitno & Arifin 2020). Learning with computers makes learning interesting as it kills normal in-classroom monotony.

Use of power-point slides, videos and computer animations to give movement and sound to immobile textbook and have students' classes livelier especially in science subjects and mathematics. However the researcher only did a study on the subject of mathematics

Dewi, (2021) in his study also came into a conclusion that there are plentiful of websites in the internet that can be helpful to teachers to advance and progress their lessons, obtain information, exchanging of ideas with peers and getting free simulations and animation to make their lessons more interesting.

2.3.2 ICT Expertise and E-learning Facilitation

To cope with the fast changing e-learning environment of e-learning it's necessary that teachers and students be having the requisite technical skills. Instead of learning about technology these skills are mainly acquired by learning with the assistance of technology.

In a study by Sheridan (2020) most secondary school students have no prior interaction with Learning Management Systems because it was not embedded in the curriculum at their pre-school and primary education level nor are there computers in their homes. Thus find it hard to adapt within the four years of secondary education.

Learners ought not to, as it were, learn ICT only as a discipline but as an instrument to utilize in learning in all other subjects. Teachers with ICT skills should use ICT to teach all the subjects. Other than learning, e-learning also aid in facilitating learning and teacher preparing lessons.

In his research on Digital Literacy in teacher education in Nigeria, Ephraim (2019) to keep up with the fast developing digital society students and teachers must attain a computer-literacy level. Being a global village the professionals of the nations of the

world should always try to catch up with their developed peers. To gain higher heights in digital literacy of the students in learning institutions, Institutions of learning and their governments are putting more efforts by initiating e-learning environments (Firat, 2018). Both the advanced and developing nations are deliberately figuring out a required digital literacy curriculum for the learners' and teachers' training.

The researcher generalized the developing countries as not all of them are in the same developmental level insofar as e-learning facilitation is concerned. Even in undeveloped nations, schools are technologically at different levels (Halverson 2018). Therefore, it is essential to carry out a research on specific countries and counties to give a vivid mirror of the situation of online learning.

In their study on systematic approach in improving e-learning in high schools in Indonesia, Pardamean and Suparyanto (2014) argue that, there is an evident correlation between the achievements of students and their computer skills. Students with better computer skills perform better as they are able to do personal research and are more confident. E-learning cannot be carried out without the necessary computer skills. The learner and the teacher must be involved for learning to have taken place. When the teacher sends homework to the learner by mail the learner must have the knowhow to be able to respond through the same online means. The researcher however did not indicate or explain the scale measure for the 'better computer skills'; how is a student with better computer skills identified? Measures on how to improve teachers and learners computer skills were also not identified. Parents input is also key as they do step up and assist learners with the homework and thus they too need to have basic ICT skills (Bansak' 2021).

Wei (2017) in a research he conducted on leadership skills on ICT execution, he looked at teachers' skills that had an influence on the ICT adoption process and its use in public

high schools in Kenya. The study's findings led to a conclusion that skilled ICT teachers in Kenya are not enough. Public high schools need enough ICT trained teachers to teach and train both students and teachers. Teachers teaching other subjects require ICT skills in order to enable e-learning facilitation and to also train their students to enable them effectively handle online learning hence facilitating e-learning.

The research focussed only on high schools that are public, omitting private high schools. Another notable gap is that the study did not give data for specific counties.

Improving teachers' ICT skills is key in e-learning implementation in the schools and specifically in the processes of learning and teaching (Mahmud R. 2017). ICT empowered teachers are confident as they practice e-learning and as they pass the same knowledge and attitude to their students. Students learn from their teachers and they also do also imitate them. Teachers having ICT knowledge will be sure to pass the same to the learners and be good role models.

2.3.3 Organizational culture and e-learning facilitation

In a research carried out in secondary schools in Rachuonyo district about readiness (Ouma, 2013) established that, e-learning adoption success requires, both the users desire to support technology as the medium for e-learning, infrastructure and the users' skills. However the study was not exhaustive as it was only done in ten high schools. The status of e-learning readiness may also have changed by now.

In a similar study on perspective of academic staff towards E-learning adoption Abas (2015) observed that, it's essential to explore the attitude held by instructors towards e-learning implementation in their learning institutions as it's them who are projected to carry out the implementation. Without having positive attitude, the process of implementation would be tasking. Thus, the attitude of implementer towards e-learning implementation has great impact on its readiness and acceptance.

In a research study carried out by Ertmer titled Teacher beliefs and integration practices, states that, the attitudes and beliefs by the teachers about the significance of technology to learning and teaching of students were believed to be holding the biggest influence to their accomplishment (Ertmer, 2016). Moreover, most teachers stated that personal mental dynamics; possessing a problem-solving attitude and desire for technology use, contributed in defining their practices in ICT. Prevailing attitudes and beliefs toward technology plus the existing levels of skills and knowledge were also noted as some bottlenecks to use of technology. In such cases a change of attitude can have e-learning facilitation being made a reality. The study was purposely narrowed down to teachers' beliefs giving an assumption that e-learning enabling infrastructure were already in place plus the needed resources thus making the research not exhaustive.

For the school administration and the relevant stakeholders to agree to set aside funds to enable e-learning facilitation, they must have a positive attitude (Boateng, 2017). Positivity is brought around by knowledge on the immense ICT usage benefits and e-learning to not only the learners but also the teachers. A negative attitude can be brought about by ignorance and lack of enough information about benefits of e-learning. In such cases school administration should establish benchmarking trips to schools where e-learning facilitation has already kicked off.

Regardless of availability of educational software, computer laboratories, internet connection, speedy growth in ICT, internet access by students and teachers in schools and homes, considerably enhanced learning institutions and ICT infrastructure, a number of teachers are reluctant in usage and adoption of e-learning (Wespi, 2015). Many teachers in Kenya, having been used to pen and paper method of assessment may want the status quo to remain. This can likely be attributed to resisting change brought about by ignorance. The schools' administration led by the head should endeavour to

have the teachers educated on the immense benefits of e-learning (Sing, G 2016). The teachers can consequently pass same knowledge and appreciation to the students. Teachers however are different when it comes to perception, perception also varies in degree and thus generalization doesn't give the true picture.

Even with availability of finances, without the right attitude towards embracing online learning it can never see the light of the day. There is a significant link between the changes related to attitude in ICT practices and the ICT integration (Rastogi, 2013). Teachers with a positive attitude towards ICT will use online learning willingly trying out different ways and methods of teaching. The easier and more interesting it becomes will increase the motivation. With the right guideline and empowerment.

Nevertheless, to some teachers and students, e-learning is too relaxed and alien, thus creating a feeling of it taking away from them the control of the learning process (Essayahi, 2022). Such an undesired attitude is caused by fear of the unknown and shying away from change. The school administration should finance education trips, seminars and workshops for teachers so as they benefit and acquire knowledge in e-learning adoption. In such sittings, teachers can have all their queries answered and thus clearing any forms of doubt regarding ICTs. Thus, the first step to e-learning facilitation is to work on attitude and perception to ensure all stakeholders are on the same line of thought (Pattnaik, 2020). Lack of exposure to benefits of e-learning may be the root of negative attitude towards adoption of e-learning. The research therefore leaves a gap that needs to be looked into.

In a research on e-learning Methods Charak (2019) states; positive or negative attitudes emanate from the society; educators, religious and political leaders parents and learners. How the society perceives e-learning as not being any better than face to face teaching and interrogating the e-learning courses credibility trickles down to the classroom as

learners are part of the society because they do borrow attitude from their homes. The political class can deliberately prioritize and enable e-learning by passing debates that supports the enactment of e-learning and purchase of systems of Learning Management (Tumwesige, J. 2020). People in authority are key when it comes to influencing attitudes to juniors. For instance at a school level, the administrators need to embrace e-learning for its facilitation to manifest. In Kenya politicians who also happen to be the lawmakers may choose to or not to pass bills supporting e-learning and especially where funding is involved.

A challenge of e-learning facilitators and campaigners being on the receiving end if e-learning was to be fully embraced (Alfale, 2023). Private institution entrepreneurs expected to facilitate e-learning external modes of education in their training institutes may eventually be edged out of business or face acute drop in profits as many parents would transfer their children to the cheaper public schools offering e-learning. Further, because e-learning inspires students to learn on their own, in-class teaching would by and by be faced out. Hence they may purport to promote e-learning but at the same time sabotage it by insisting on dependency on teachers (Wang. S.Y 2023).

In Kenya big private schools are owned by some lawmakers who may hesitate to pass laws that would only benefit public schools with ICTs. In the case of Naivasha Sub-County, private schools teachers may feel that e-learning may lead to their job loss as learners would study on their own or move to cheaper public schools. Thus education on the importance of e-learning and how it is carried out should precede its facilitation. The researcher however did not find out the cause of the undesired attitude. In some instances, negative attitude towards e-learning facilitation may be caused by genuine lack of knowledge on e-learning benefits in schools.

2.3.4 ICT infrastructure and E-learning Facilitation

Oguti (2015) in his research study on effective e-learning facilitation in schools found out that, one or two computers may not serve the desired purpose of facilitating e-learning, computers must be enough for all teachers and learners. In homes, financially able parents should also acquire computers and smart phones for their high school going children. As devolution and county government takes roots and progresses, changes are expected to happen frequently, thus research should be done regularly to have the real current picture of e-learning facilitation in various counties and schools.

Wichadee (2015) in their research on perception of users in LMS' adoption, recommended an increased investment strategy of additional funding to enable improving and equipping schools with ICT trainers and ICT infrastructure as it will enable the learners and teachers in Kenya to deal with technical skills and psychological challenges. Having the necessary technologies; computers and internet automatically nurtures a positive attitude in both students and teachers towards e-learning facilitation. (Mashau P, 2021).

Moreover, it motivates the teachers and students especially after practically interacting with it and making duties easier and faster. However even with Infrastructure the perception and attitude may still be negative. Some schools have computers lying unused in stores. Teachers and students need education on benefits of e-learning facilitations and benchmarking in schools that have already facilitated e-learning.

In his research on prediction of the intention web-based learning system use (Caliris, 2014) concluded that the use of computers was projected by intents of its use and its perceived usefulness. Positive attitude towards LMS use by the teachers, ensures that they can seamlessly offer progressive insights on e-learning facilitation which

consequently benefit the learners who then gets motivated, support e-learning and support each other by practising and learning together.

There is a major need to cultivate teachers and students' attitude and perception before proceeding to other factors. In a research paper on teachers' perceived obstacles to ICT incorporation in early childhood teaching carried out in Mainland China, (Pange, 2015) opined that, one of the main determiner of integration of ICT's is leadership that is effective, the school principals and members of the school board are key decision makers in how the school is run. Other than overseeing daily activities in the institutions school heads are also obligated to ensure that learning and performance of students is up to standard.

When the school manager embraces use of LMS and e-learning he/she will sell the same idea to teachers and the parents (Kundu 2021).The school heads should commence on how to communicate and pass information to teachers, students and parents. If done online, all the stakeholders will start appreciating the use of LMS. E-learning facilitation therefore, majorly depends on the attitude and perception of the school manager towards benefits of e-learning facilitation.

In their research on the issues hindering full e-learning adoption in Kenyan high Schools, Gichoya and Muumbo (2015) found out that e-learning projects encountered myriads of hindrances. They specifically picked out undesirable attitudes towards e-learning among instructors and learners as the main stumbling block to the actualization of e-learning adoption. As per their study, attitude held by the implementers is majorly the reason for a fruitful ICT assimilation in the school's learning and teaching.

For the success of e-learning facilitation, all stakeholders have a part to play (Hoque. M. 2018). However the back always stops with the administration led by the school's principal. It is therefore important for the school heads to devise ways of ensuring all

the stakeholders have enough knowledge on ICT that will in turn change their attitude towards its facilitation.

Ijaz and Qureshi (2012), a challenge of unlimited funds in institutions can be solved by using open source software which are almost free, sourcing resources from the government and non-governmental organisations. Unfortunately developing countries like Kenya may not prioritize funding of schools to enable e-learning and so schools might be forced to look for other means to fund such projects. Qureshi also did recommend the setting up of centres of national e-learning development that emphasises on the e-learning undertakings development and coordination within a learning institution. Such centres may require a lot of investment. Many schools in Kenya would appreciate to at least have the basic amenities required to kick start e-learning and others to come later, (Wausi 2020). In order to assimilate the LMS into their learning and teaching and to support effort towards e-learning facilitation, teachers must believe that LMS technologies will fulfil their necessities and those of their students (Olema V. 2019).

In a research study on issues that influence implementation and incorporation of ICT in learning by teachers, (Lawrence, 2018) states that the teacher's attitude can determine the realisation of ICT incorporation in daily running and learning of and in high schools. Consequently, he asserted that the attitude of teachers is a major determiner to acceptability and usage of computing devices in teaching areas and their learning management. The study however left out the impact of learners' attitude. Learner's attitude is often influenced by the parent's attitude.

In a school ICT infrastructure availability is a pointer to an environment conducive for e-learning as learning cannot happen in a vacuum (Wabeke 2021). The teachers need enough computers, power connection cables, reliable internet connections and the

necessary online learning applications installed in those computers. The learners on the other hand will need computer gadgets and smart phones at home fully installed with the online learning applications students and teachers will be able to seek more knowledge about e-learning even without being pushed around.

In Africa, many nations have begun embracing considerable investing towards e-learning and passing of novel policies focussed at making teachers embrace use of ICT in schools (Asongu, 2019). For Schools to realize online learning, there has to be a deliberate will to invest a lot on the ICT sectors; training of teachers, buying of enough computers, connecting electricity and fast internet and all the other necessary installations. All stakeholders in a learning institution, must be willing to allocate enough resources to realise e-learning in the schools (Kong S.C. 2019). However different countries in Africa are at different levels in ICT's considerations and e-learning facilitation and therefore the research need to be constricted to particular countries.

A research; Adoption of in learning institutions in Tanzania, by Mwakyusa (2016) recorded that the main inhibitions to successfully implementing e-learning in Tanzania was ICT infrastructure considering that e-learning success is dependent on tools of ICT like availability of sufficient computers to students and teachers. Thus, insufficient ICT infrastructure may leads to inadequate access to technologies and inability to run the systems regularly. The researcher however generalized all learning institution in Tanzania colleges and high schools and all the infrastructure without being specific on available power and internet connections plus availability of computers.

In general most developing African countries face similar challenges in efforts of enabling e-learning facilitation. Lack of resources as a result of mega corruption, misplaced priorities due to bad governance and lack of good policies. Lack of a long

term plan and good policies leads to failing of good projects like e-learning facilitation (Cooper M. 2015).

Without government support and funding parents and teachers are limited. The government needs to deliberately pump in resources and come up with a long term plan to have schools facilitate e-learning (Kibuku, 2020).

In conclusion, the schools' organizational culture, level of ICT expertise among teachers and learners ICT infrastructure and LMS' considerations are all a priority in enabling of e-learning facilitation. However with a positive attitude and perception brought about by knowledge of the benefits of e-learning facilitation infrastructure and ICT training can easily be actualized.

2.4 Summary of Reviewed Literature

Looking at the reviewed literature, it is clear that, a number researchers have thoroughly and comprehensively focused on how ICT has impacted teaching and learning in institutions. However researchers haven't narrowed down to Learning Management Systems impact on learning and teaching.

Other studies have focused on information systems impact on specific subjects for instance use of simulation games to teach mathematics and English. Therefore leaving a knowledge gap of not having a study that focusses on Learning Management Systems' considerations on e-learning facilitation. Additionally, some of studies have been done on how Management Information Systems has impacted on sectors like banking and small businesses leaving management systems in education sector.

The researchers who have focused on LMS and e-learning have mostly studied higher institutions.

The few studies that have been done on LMS and e-learning in schools have been done in other countries and those in Kenya not any has been done in Naivasha Sub County in Nakuru County. This study will thus fill a knowledge gap on Learning Management Systems' Considerations on e-learning in Naivasha Sub County.

Table 2.1: Summary of research gaps

Author	Focus of the study	Findings	Research Gaps	Current Study Focus
Dhawan, S. (2020)	Online learning during COVID-19 crisis in India.	Some schools switched to online learning	Only a few schools that were able to actualize e-learning and only focused in India	Focuses on LMS's Consideration and E-learning in Kenya
Arifin, Suyitno & Dewi, (2020)	Mathematics Creative Thinking Skills in Problem based E-learning model.	E-learning invokes curiosity in education and capture learners interest. Killing the classroom monotony and boredom during mathematics lessons.	The study focuses on Mathematics only. In high school students focuses on other subjects which line they want to pursue. E.g. languages and sciences.	Focus is e-learning facilitation is school. To benefit learners, teachers and administrators

Kazimova (2017)	Using simulation to learning English	English learning is made more fascinating by simulation which is interactive and interesting	The research only focussed on English teaching.	This research is all round focussing on learning of all subjects.
Mukuna (2013)	Integration of ICT in to Teachers training in Kenya.	ICTs can deal with teachers feeling isolated, removing classroom's barriers and linking them to their professional peers, tutors, and experts in curriculum locally and worldwide.	The study mainly focuses on teacher training leaving out students who are a key player in e-learning facilitation.	This study focuses on both teachers and students.
Zaini, A. (2018)	Word processors as monarchs: Computer-generated feedback	Word processing helps teachers in time saving through modification of teaching resources in place of always	Other than word processors, other computer application are equally important as the	The study is wholesome covering all LMS

		<p>generating new ones.</p> <p>Used to prepare lesson plans, professional books, lesson records and examinations</p>	<p>complement word processor.</p> <p>The author also concentrates more of importance to the teachers leaving out the student who complete the learning process.</p>	
<p>Nawaz A. & Kundi M. (2010)</p>	<p>Digital literacy in Pakistan</p>	<p>Teachers and students should attain a degree of computer-mastery to keep up with the developing digital societies.</p> <p>Policy makers in higher education institutions are progressing by provision of learning</p>	<p>The study dwells more on efforts made by the government, overlooking the effect that teacher's learner's beliefs and attitude are also key contributors in e-learning facilitations.</p>	<p>This study covers all aspects that affect e-learning facilitations.</p>

		environments to gain increased digital literacy of learning institutions.		
Mingaine (2013)	Teachers skill influence on ICT adoption	The research concluded that teachers with ICT skills were not enough	The research overlooked other factors affecting ICT adoption	This research covered learners skills, ICT infrastructure among other factors necessary to enable e-learning
Pardamean and Suparyanto, (2014)	Systematic Approach in Improving E-learning is high schools in Indonesia	Students' computer skills has a strong correlation with their achievements. Students with better computer skills perform better as they are able to do personal research and are more confident.	Author did not indicate scale measure to pass as better computer skills. Measure on how to improve teachers and learners computer skills are also not clearly indicated.	This study is wholesome, covering. Relationship between infrastructure, organization culture and ICT expertise with e-learning.

		E-learning cannot be carried out without the necessary computer skills among the teacher and the learners.	Parents are also stakeholders as they may step in to assist learners in E-learning at home and thus they too should have some computer skills	
Ertmer (2012)	Teachers beliefs and integration practices	The research concluded that the teachers beliefs and attitude are key in e-learning integration	The researcher left out other students factors, infrastructure and even teachers ICT knowhow	This research is comprehensive covering all factors affecting e-learning facilitation
Charak (2019)	e-learning methods	The research opined that, attitudes from, society, educators, and leaders affect e-learning facilitation.	The research left out other factors like availability of ICT infrastructure and teachers expertise as prerequisite	This research was thorough and inclusive covering all the prerequisites to e-learning facilitation

			for e-learning facilitation.	
Abas (2015)	Perspective of Academic Staff Towards E-learning adoption.	Instructors of perspective towards e-learning adoption is key since they are the implementers	The research left out students and leader perspective which is equally important	The research covered organization culture, ICT infrastructure and ICT expertise which are key determinants of e-learning facilitation success
Lawrence (2018)	Issues that influence ICT implementation	Teachers' attitude can determine the success of ICT implementation	ICT infrastructure as a determinant was left out	The research covered all the determinants in e-learning facilitation
Pange (2015)	ICT integration and leadership	The research observed the importance of leadership in ICT adoption as leaders are the key decision makers.	However the research left out other factors like teachers and learners ICT knowledge as factors to consider	The research was comprehensive looking into all the possible factors necessary to actualize e-learning implementation

Gichoya nad Muumbo(2015)	Issues hindering full e-learning adoption in Kenyan High Schools	E-learning projects encountered myriads of hindrances; undesirable attitudes, attitudes held by implementers were seen as the major factor affection the e-learning implementation .	The research left out factors like attitude of recipients; students and also availability of the necessary ICT infrastructure .	The research covered the possible factors from organization culture, ICT infrastructure to teachers' expertise in E-learning facilitation.
---------------------------	--	--	---	--

Source: Author (2023)

2.4 Conceptual framework

The below conceptual framework elucidates the connection between the dependent and independent variables of the research study the independent variables being; LMS consideration (software application of robustness and interoperability) ICT expertise, (teachers and students ICT competency) organizational culture (teachers and students attitude and perception towards LMS) and ICT infrastructure (internet and power connectivity and computing devices). Dependent variable being e-learning facilitation in schools (online teaching support, assessment support and accessibility to teaching resources).

INDEPENDENT VARIABLES

DEPENDENT VARIABLE

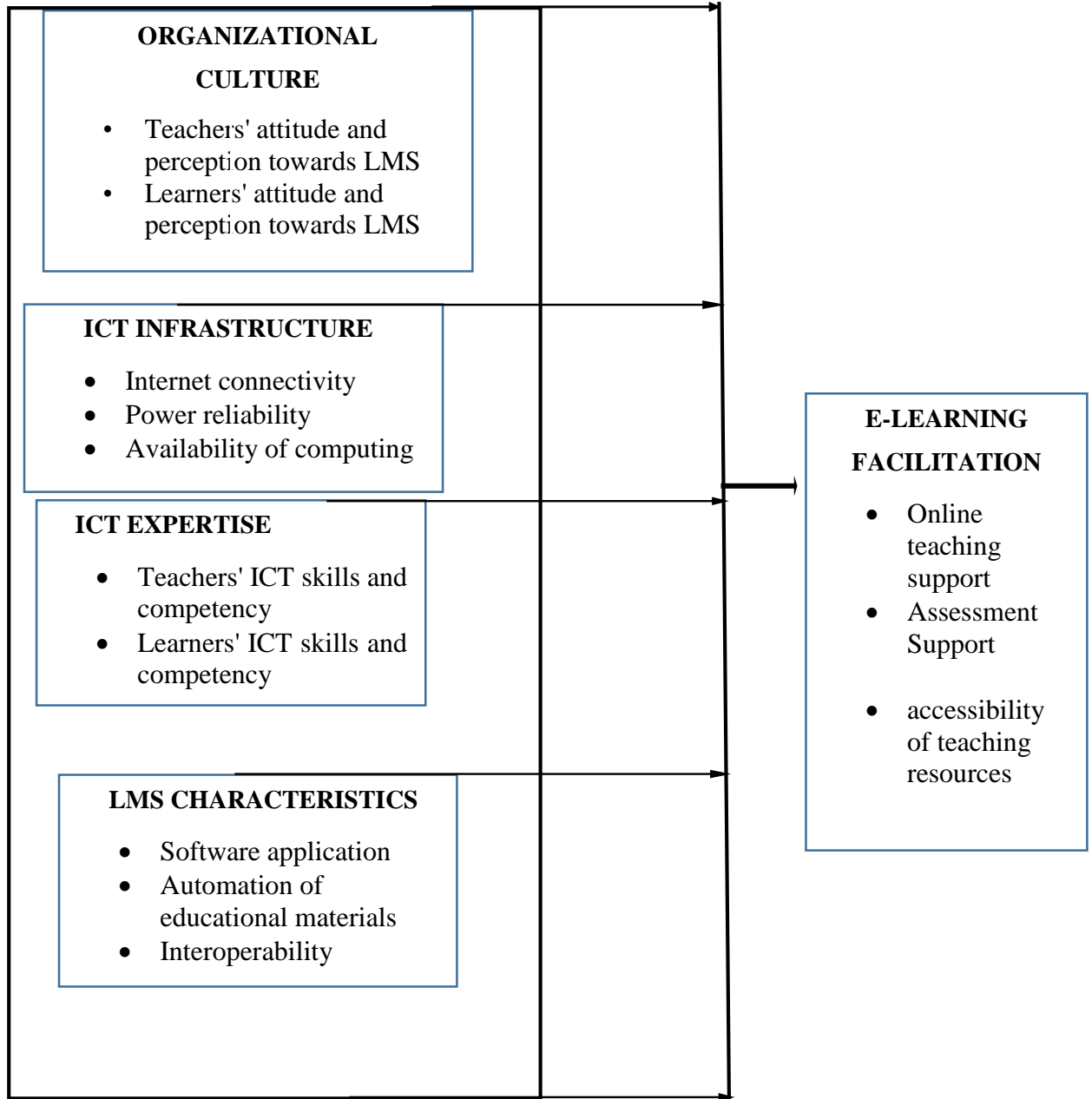


Figure 2.1 Conceptual framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the; research design, target population, sample and sampling techniques, research instrument, validity and reliability of research and data analysis and presentation. To realize the objectives set for the study some scientific methods have been elucidated.

3.2 Research Design

Descriptive survey design is used for this study to determine Learning Management Systems' and e-learning considerations in secondary schools in Naivasha Sub-County. Descriptive research design pursues to acquire data, rigorously explain a situation or a phenomenon.

This design explains the how, where, when and what queries concerning a research problem, as opposed to the why Mohajan, (2018) to realize accurate feedback descriptive survey design has an advantage of enabling the researcher to assess situations in an area of study at the very time the study is being carried out. According to Siedlecki (2020), descriptive survey design is a strategy aiding the researcher to get answers to issues encountered and also to direct the researcher through the several phases of the study.

The researcher used descriptive design to assess the schools ICT infrastructure; visible power connectivity, computing devices and learning software and how they impact LMS facilitation. This design gave a vivid image of the extent of LMS' facilitation in secondary schools. Use of questionnaires is allowed in descriptive survey design. Questionnaires are commonly preferred as they are good in obtaining facts about

existing circumstances and are useful in making explorations regarding attitude, opinion, beliefs and perceptions.

3.3 Target population

The research study was executed in secondary schools in Naivasha Sub-County. The secondary schools are 61 in number and the research targeted head teachers and teachers. The target population includes 61 head teachers and 806 teachers.

3.4 Sample and Sampling Techniques

This specific study had the following strata's: Extra County, County, Sub-County and private secondary schools. To select respondent schools from the various categories stratified random sampling method was used. Mugenda and Mugenda (2003) asserted that a sample that is worthy should be range from 10 percent to 30 percent of the entire study population. Conversely, Kathuri and Pals (1993) suggested that the smallest research's sample size in a study, should be 100 for every main sub-group and 20 for each minor sub-group.

The study targeted heads of institutions and teachers. The Sub-County has a total of 61 schools and 806 teachers. A study sample of 259 respondents was a derivative of the population of 806 from the high schools in the Sub-County of Naivasha; using stratified random sampling technique by computing 30 percent of teachers and 10 percent of head teachers.

Table 3.1 Sampling Frame

Study population	Target population	Sampling method	Sample size	Data collection instruments
61 schools;Extra County, County, Sub-County and private secondary schools	Head teachers	Simple random sampling	18	Questionnaire
	Teachers	Simple random sampling	241	Questionnaire
	806			

3.5 Research Instruments

The study employed closed-ended questionnaires as its research instruments to gather data. According to Yin (2017), questionnaires are efficient in collecting a substantial amount of data within a reasonable time-frame and facilitating measurement in support of or in opposition to specific viewpoints. The questionnaires in this study were formulated to prompt responses related to each of the indicators for the independent variables. To streamline the data processing, the responses were standardized into a consistent format. The questionnaires for heads teachers and teachers consisted of two sections. Section A focused on gathering background information, while Section B was dedicated to collecting information aligned with each research objective.

3.6 Research Instrument's Validity

The validity of the instrument refers to how well it accurately represents the abstract concept being studied (Heale, 2015). To ensure the content validity of the instrument, input was sought from the university supervisors who are well-versed in the research area covered by the questionnaires and interview schedules. These experts conducted a peer review of the items, offering suggestions for enhancing their quality. This process aimed to augment the correctness, accuracy and meaningfulness of the data obtained (Heale, 2015).

3.7 Reliability of Research Instruments

The reliability of an instrument refers to its ability to consistently and accurately measure specific attributes in research (Bell, 2010). In this context, the investigator employed a pilot test method to assess reliability. This pilot study took place at public and private secondary schools in neighboring Gilgil Sub County. During this study, the test-retest technique was utilized to gauge the stability of scores obtained from the instrument's items. The pilot study involved 25 participants, which constituted 10% of the intended sample size.

Cronbach Alpha co-efficient was used to test for reliability by a computation the core consistency of various questionnaire's items and gauge their reliability. A test having a Cronbach alpha of 0.75 signposts a reliability of 75 percent. Thus a coefficient of 0.75 or higher was considered reliable.

3.8 Assumptions of Regression

Diagnostic tests was run to check and affirm that there were no breach of the traditional linear regression model assumptions preceding moving on to estimation of the equation. When the conventional affirmations regression model are breached, contorted and ineffective constraint approximations outcome. Hence, diagnostic tests are carried out to confirm that the regression analysis conventions don't face contravention. The tests included multicollinearity, autocorrelation, heteroskedasticity, normality besides specification test's model.

3.8.1 Multicollinearity Test

Multicollinearity was tested by a correlation matrix, with a 0.8 multicollinearity threshold which is ideal (Schindler and Cooper, 2013). When multicollinearity is not considered, endless standard errors and unclear regression coefficients occur, resulting in massive standard errors. Tolerance levels and variance inflation factors (VIF) was

employed. Any multicollinear variables was removed from research, and a new measure was selected and substituted with the collinear variable.

3.8.2 Autocorrelation

To make a determination if autocorrelation exists, this study used the Wooldridge test for sequential correlation. When analysing panel data, serial autocorrelation is a common occurrence that must be addressed in efforts to attain the optimal model2specification. In this test, the null hypothesis for this test is that serial autocorrelation is non-existent. Lagging the dependent variable was used to discontinue data that has been recognised to contain cross-sectional dependency.

3.8.3 Heteroskedasticity

Heteroskedasticity is a Classical Linear Regression Model (CLRM) assumption existing, it ought to be proved and meticulously accounted for. The error term has a constant variance. In this research, the panel level of heteroskedasticity was measured using the Likelihood-Ratio test (Schindler & Cooper, 2013). The null hypothesis is that there is a homoscedastic error variance. This research utilized strong standard errors in the model if the data doesn't attain the test.

3.8.4 Normality Test

The assumption that the residuals of the response variables got normal distribution of the mean is tested using normality tests. It was determined using the Shapiro-Wilk test or the Kolmogorov-Smirnov test. If the test is failed by the data, additional information was collected. On the collected data, in addition the researcher used natural logarithms.

3.9 Data Analysis and presentation

To analyse, deduce and present the collected data, descriptive Statistics was used. Statistical Package for Social Sciences package was made use of. Descriptive statistics for example; percentages, standard deviation, mean and frequencies were used.

Regression analysis in inferential statistics was also used to show the connection between independent variables and the dependent variable. Regression analysis, a strong technique for data analysis, lets organizations and researchers make educated decisions by predicting outcomes based on historical data. Regression analysis is useful in a variety of domains, including forecasting, risk assessment, and trend identification. It also provides decision-makers with data-driven insights.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

Whereby

Y=LMS' considerations

X1=ICT expertise

X2=ICT Infrastructure

X3 = Organizational Culture

X4 = E-learning facilitation,

β_0 = Constant $\beta_1 \beta_2 \beta_3 \beta_4$ = Coefficients μ = the error term.

Where need be, presentation of the analysed data was done in form of; graphs, tables and pie-charts.

3.10 Variable Operationalization

Table 3.2 Operationalization of Variables

Variable	Type of Variable	Operationalization of the Variable Give the variable definition	Variable Indicators	Questionnaire
Organizational Culture	Norminal	<ul style="list-style-type: none"> Teachers' attitude and perception towards LMS Learners' attitude and perception towards LMS 	Descriptive and inferential statistics	Likert scale questionnaires, Frequencies and percentage. Regression and correlation
ICT Infrastructure	Norminal	<ul style="list-style-type: none"> Internet connectivity Power reliability Availability of computing 	Descriptive and inferential statistics	Likert scale questionnaires, Frequencies and percentage. Regression and correlation
ICT Expertise	Norminal	<ul style="list-style-type: none"> Teachers' ICT skills and competency Learners' ICT skills and competency 	Descriptive and inferential statistics	Likert scale questionnaires, Frequencies and percentage. Regression and correlation
LMS Characteristics	Norminal	<ul style="list-style-type: none"> Software application Automation of educational materials Interoperability 	Descriptive and inferential statistics	
E-Learning facilitation	Norminal	<ul style="list-style-type: none"> Online teaching support Assessment Support Accessibility of teaching resources 	Descriptive and inferential statistics	Likert scale questionnaires, Frequencies and percentage. Regression and correlation

3.11 Ethical Consideration

The collected data was solely used for purpose of academics; the researcher lived to the promise of accepting responsibility of upholding; respondents' rights, secrecy,

respect, discretion, professional ethics and respondents' security, throughout the task of collecting data. To guarantee secrecy and ensure the privacy of the participants, the questionnaires did not call for respondents to write their names or any other form of credentials. This helped to create trust in the participants. Respondents' consent was sought before administering the questionnaires. Responding was also voluntary. Before the research confirmation dates were made with the principals and permission sought to perform the research study in the sampled schools in order to avoid unnecessary hindrances in schools. An approval letter from Kenyatta University Graduate School was sought and was used in seeking research permit from NACOSTI.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

The acquired primary data results is presented in this chapter. Further, it provides the characteristics of respondents, their personal views and opinions on the influence of learning management systems' considerations on facilitation of e-learning in high schools in the Sub-County of Naivasha, Nakuru County, Kenya. To simplify this presentation, the researcher used tables summarizing the respondents' responses.

4.2 Preliminary Results

4.2.1 Response Rate

This research's objective was to have an exploration of the impact of learning management systems' considerations on facilitation of e-learning in Naivasha Sub-County's high schools, Nakuru County, Kenya .The subjects of this study included 61 principals and 806 secondary school teachers from the Sub-County of Naivasha, Nakuru County, Kenya. Of the 259 administered questionnaires, based on the study's sample size, a sum of 181 questionnaires were returned after completion, yielding a response rate of 69.9 %. As per Kothari (2008), a more than 50 percent response ratio is sufficient for a descriptive study.

Table 4.1: Questionnaire Return Rate

Respondents category	Number administered	Number returned	Percentage returned
Principals	18	18	100
Teachers	259	181	69.9

4.2.2 Demographic Information

The researcher assessed the gender distribution of those responding to find out gender involvement of men and women in learning management system considerations regarding e-learning support. The findings are summarized in Table 4.2

Table 4.2: Gender of the Respondents

Gender	Frequency	Percentage
Male	113	62.4
Female	68	37.6
Total	181	100

Source: Research Data (2023)

Research results show that surveyed men contributed 62.4 percent while women were 37.6 percent. This implies that in high schools in the Sub-County of Naivasha, Nakuru County, Kenya, gender equality is taken into account although female teachers still predominate. Mulwa (2017) notes that equality of gender supports teamwork of the individuals, regardless of gender, and also offers a supportive environment in which individuals intermingle with their peers without any form of discrimination.

4.2.3 Age Brackets of the Respondents

The study aimed at establishing the respondents' distribution of age. The summary of the results are shown below in Table 4.3.

Table 4.3: Age Brackets of the Respondents

Age brackets	Frequency	Percentage
21-30 years	75	41.4
31-40 years	37	20.4
41-50 years	18	9.9
51-60years	51	28.2
Total	47	100

Source: Research Data (2023)

Many of those who responded are in the age group of 21 to 30, accounting for 41.4 percent. Those in the age of bracket 31-40 years were 28.2 percent, age bracket 41-50 years were 20.4 per cent, while age bracket 51-60 years were 28.2 percent. The inference is that majority of respondents were aged above thirty-five years. Teachers' capacity to give information contributes altogether to understudy accomplishment in schools (Ibhafidon & Alufohai 2015). Researches have pointed that instructor factors such as age and educating encounter have a clear influence on educator adequacy. Zafer and Aslihan (2012) found that more seasoned and matured instructors were more successful in educating and had way better classroom administration abilities than more youthful auxiliary school instructors. This research is upheld by Aloka and Bojuwoye (2013), who found out that youthful instructors regularly make less secure choices and don't analyse the setting carefully when managing their teaching and lack the needed understanding as compared to more seasoned teachers. This result isn't much diverse from afterward work by Ondigi and Gathumbi (2015) in their cross-sectional study of Kenya, which appeared that more seasoned instructors were more likely to make strides understudy learning than older teachers with older teachers in middle age and younger.

4.2.3 Level of Education

The respondents were required to specify their higher most level of education by ticking. The outcomes are tabulated in Table 4.4.

Table 4.4: Education level

Education level	Frequency	Percentage
Diploma	37	20.4
Bachelors	89	49.2
Masters	55	27.4
Total	181	100

Source: Research Data (2023)

The outcomes implies that 49.2 percent of respondents have bachelor's degrees, 27.4 percent have undergraduate and master's degrees, and 20.4 percent of respondents have degrees. This shows that the respondents have sufficient knowledge to interpret and meet the research objectives convincingly. Research is not conclusive on the minimum education required for teaching, especially at the primary level. Several studies show that, past a certain threshold, educational attainment has a moderate or even no effect on academic performance at the primary level best, (Tournier & Chimier, 2018).

4.2.4 School Category

Respondents were required to indicate which high school they were working at. The results are as in Table 4.5.

Table 4.5: School Category

Category	Frequency	Percentage
Extra county	50	27.6
County	67	37.0
Sub-County	53	29.3
Private	11	6.1
Total	181	100

Source: Research Data (2023)

The results showed that 37.0 percent of people that responded came from within County schools, 29.3 percent Sub-County schools, and 27.6 percent from Extra County schools,

while 6.1 percent came from Private schools. This implies that the respondents were well represented. The Association of Boarding Schools (2013) compared the encounters of American boarding schools and day schools. The comes about appeared that boarding schools were more likely to report that they were fulfilled with their learning encounter and more likely to report that the school arranged them for college.

4.2.5 Working Experience

Respondents were inquired to describe the length of time they had worked in those high school. The responses are tabulated in Table 4.6.

Table 4.6: Working Experience in the Secondary Schools

Working Experience	Frequency	Percentage
0-5 years	29	16.0
6-10 years	33	18.2
11-15 years	64	35.4
16 years and above	55	30.4
Total	181	100.0

Source: Research Data (2023)

Based on the results in Table 4.6, 35.4 per cent of people who responded have worked at their current schools between the ages of 11 and 15, 30.4 per cent have worked at their respective schools from 16 years or older, 18.2 per cent worked for their respective schools from the age of 6 to 10 years, while 16 per cent worked at the respective schools between the ages of 0 and 5. The inferences of these findings suggest that interviewees have sufficiently worked and are aware of management systems' considerations learning in facilitating e-learning in high schools in the Sub-County of Naivasha. Thus, they provided useful information for the study. Odumbe, Simatwa and Ayodo (2015) opines that teachers having longer working experience will have improved

performance; and that veteran teachers are involved in their lesson preparation and are willing to allow learners to deviate from their learning outcomes.

4.2.6 Designation

Respondents were asked to name their post. The responses are tabulated in Table 4.7.

Table 4.7: Designation in the Secondary Schools

Designation	Frequency	Percentage
Head teacher	15	8.3
Teacher	166	91.7
Total	181	100.0

Source: Research Data (2023)

In accordance with the outcomes in Table 4.7, 91.7 percent of those who responded are principals and 91.7 percent are teachers. The significance of these results suggests that respondents are well distributed; therefore, they provided valuable information for the study. Collaborative efforts to strengthen school leadership is still a main focus of assessment to promote the maintenance and standards of education of secondary schools in sub-Saharan Africa (Ondigi, 2015).

4.3 Pilot Test of the Study Instruments

Reliability analysis was performed utilizing Cronbach's Alpha to survey inside consistency by deciding whether certain things on the scale degree, the same develop esteem. Kothari (2012) suggests an Alpha esteem limit of 0.7. The outline in Table 4.8 underneath appears that all five scales are solid since their by and large unwavering quality values all surpass the limit of 0.7. This deduces the dependability of instruments of research that were used.

Table 4.8: Reliability Analysis

Determinant	No of items	Cronbach's	Verdict
ICT Infrastructure	6	.954	Is reliable
LMS Characteristics	6	.858	Is reliable
Organizational Culture	13	.882	Is reliable
ICT Expertise	9	.953	Is reliable
E-learning facilitation	12	.769	Is reliable
Overall Reliability	46	.929	Is reliable

Source: Research Data (2023)

The Cronbach's Alpha results tabled above indicates that the data collection tool used is consistent as all the values are beyond the threshold value of 0.7.

4.4 Validity Test

The degree to which theory and data support test score interpretation in the suggested tests is implied by validity. Supervisors evaluated the validity of the instruments. The validity of the samples and items was determined prior to the real study in the current research being initiated. The alignment of the test's evaluated results with the objectives and research questions is important to the concept of content validity. Item validity is defined as the caliber of the objects used to measure content. Construct validity was achieved via Exploratory factor analysis (EFA) using component analysis principal. A factor loading of 0.5 is acceptable level. Bartlett's test of sphericity and Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy further authenticate the suitability of the factor analysis. The value for KMO measures of sampling adequacy should be greater than 0.5, and is inadequate if less than 0.5.

Table 4.9: Validity Test Results

Variable	Number of Items	KMO	Bartlett's Test of sphericity
ICT Infrastructure	6	0.519	.000
LMS Characteristics	6	0.581	.000
Organizational Culture	13	0.613	.000
ICT Expertise	9	0.714	.000
E-learning facilitation	12	0.624	.000

Source: Research Data (2023)

Table 4.9 four items had factor loading greater than 0.5 and they were retained to be used in the subsequent analysis. The KMO values indicated the sample was adequate while the Bartlett's Test of Sphericity (.000) was significant.

4.5 Diagnostic Test

Pre-estimation tests were carried out for the purpose of justifying the use of the regression model.

4.5.1 Normality Assumptions Test

To check for normalcy, the Shapiro-Wilk test was utilized. By determining whether skewness, kurtosis, or both are present, this test determines how normal the data are. Figures greater than value of the Shapiro-Wilk Test is greater than 0.05, the data is normal. If it is below 0.05, the data deviate significantly from a normal distribution (Razali & Wah, 2011). According to Krishman (2006), data exhibit a considerable deviation from a normal distribution if it is less than 0.05. Results for the test of normality are presented in Table 4.3.

Table 4.10: Normality Assumption Test Results

Variables	Shapiro Wilk	
	Statistic	sig
ICT Infrastructure	.723	.845
LMS Characteristics	.924	.757
Organizational Culture	.815	.698
ICT Expertise	.718	.823
E-learning facilitation	.812	.721

Source: Research Data (2023)

The results in Table 4.10 showed that $p\text{-value} > 0.05$, thus the null hypothesis that that data is normal is therefore not rejected. This confirmed that the assumption of normality was satisfied.

4.5.2 Multi-collinearity Assumption Test

When many variables in a multiple linear regression analysis have a substantial correlation with both the dependent variable and one another, this phenomenon is known as multicollinearity. Some of the significant variables under examination become statistically insignificant as a result of multicollinearity. The variance inflation factor is used to test for multicollinearity (VIF). The variance inflation factor (VIF) calculates the amount that an estimated coefficient's variance would increase by if there was no correlation between the independent variables. When VIF is less than 10 and tolerance is more than 0.1, multicollinearity is not an issue; that is, no independent variable has a high correlation with any other. The test results are displayed in Table 4.11.

Table 4.11: Multi-collinearity Assumption Test Results

Variables	VIF	Tolerance
ICT Infrastructure	2.156	0.345
LMS Characteristics	4.034	0.112
Organizational Culture	3.217	0.324
ICT Expertise	4.120	0.401
E-learning facilitation	3.112	0.215

Source: Research Data (2023)

The results show all variables had a VIF of between 2.156 and 4.120, while tolerance values were between 0.112 and 0.401. It was an indicator that there lacked multi-collinearity problem among the independent variables since $VIF < 10$ and $tolerance > 0.1$

4.5.3 Autocorrelation Assumption Test

The study used Durbin Watson test to test for autocorrelation. Durbin-Watson statistics have a value ranging between 0 and 4. A value of 2.0 shows autocorrelation was not detected in the sample. A value approaching 0 indicate existence of positive autocorrelation while a value approaching 4 indicate presence of negative auto correlation. A rule of thumb is that Durbin Watson test statistic values in the range of 1.5 to 2.5 are relatively normal. Values outside this range are a reason to raise concern. The results are presented in Table 4.12.

Table 4.12: Autocorrelation Assumption Test Results

Variable	Durbin-Watson
ICT Infrastructure	1.513
LMS Characteristics	1.714
Organizational Culture	1.628
ICT Expertise	1.632
E-learning facilitation	1.703

Source: Research Data (2023)

The findings in table 4.12 above indicated that Durbin Watson values ranges between 1.513 and 1.714. These values are within the accepted limits of a rage of 1.5 to 2.5. Thus, there is no problem of autocorrelation. In conclusion, the instruments for collecting data were found to be valid and reliable and therefore could be used for data collection in the main study.

4.6 Relationship between ICT Infrastructure and E-learning Facilitation

The first objective of the study was to establish the relationship between IT infrastructure and e-learning support in high schools in Naivasha Sub-County. Those responding were requested to assert the degree of their agreeing with statements regarding e-learning facilitation. The outcomes are tabulated in Table 4.13.

4.6.1 Statistical description of ICT Infrastructure

Table 4.13 portrays descriptive statistic on ICT Infrastructure and E-learning facilitation

Table 4.13: Relationship between ICT Infrastructure and E-learning Facilitation

Statements	N		VL		I		C		VC		Mean	Stdv
	F	Per cent	F	Per cent	F	per cent	F	per cent	F	per cent		
Power (KPLC, generator, solar panels)	24	11	50	24	43	21	64	31	-	-	2.81	1.06
Computer rooms/laboratories for e-learning facilitation	23	11	47	22	46	22	61	29	4	2	2.86	1.08
Computers (desktops, pads, laptops)	16	8	30	14	62	30	66	31	7	3	3.09	1.01
Furniture (desks, chairs, tables) for e-learning facilitation	16	8	44	21	56	27	58	28	7	3	2.97	1.03
Reliable internet data	4	19	2	10	-	-	13	62	2	10	3.24	1.06
Learning Management Systems (educational software)	16	8	23	11	42	20	96	46	4	2	3.27	1.02

(n=181, Average Mean=3.04)

Source: Research data (2023)

IT infrastructure is recognized as one of the issues influencing the facilitation of e-learning in secondary schools in Naivasha Sub-County, Kenya. Research aims to confirm and establish this claim.

Therefore, respondents were implored to write their answers on a Likert scale for rating from 1 to 5 where : (1) None (2) Very lacking (3) Incomplete (4) Complete (5) Very complete. Analysis of Table 4.6 shows that the most respondents concurred that the learning management system (educational software) is appropriate; mean (3.27) and S.D (1.02). This is followed by complete and reliable Internet data, with a mean of (3.24) and S.D of (1.06). Many respondents also agreed that computers (desktops, tablets, laptops) have the mean (3.09) and S.D (1.01) and the computer room/room Experiments to support online learning are consistent with the mean (2.86) and S.D of (1.08). In a school ICT infrastructure availability is a pointer to an environment conducive for e-learning as learning cannot happen in a vacuum. The teachers need enough computers, power connection cables, reliable internet connections and the necessary online learning applications installed in those computers. The learners on the other hand will need computer gadgets and smart phones at home fully installed with the online learning applications students and teachers will be able to seek more knowledge about e-learning even without being pushed around.

4.7 Relationship between LMS characteristics and E-learning Facilitation

The second objective of the research was to evaluate how LMS features affect online learning support in high schools in Naivasha Sub-County. Those responding were asked to express the extent to which they were agreeing with those statements regarding the effect of LMS features on facilitating online learning in high schools in the Sub-County of Naivasha, Kenya. The results are tabulated in Table 4.14.

4.7.1 Descriptive Statistics of LMS characteristics

Table 4.14 LMS characteristics and e-learning facilitation

Table 4.14: Relationship between LMS characteristics and E-learning Facilitation

Statements	YES		NO	
	F	percent	F	percent
Are all computers in the school connected to the internet?	30	17.1	151	82.9
Is the internet reliable and fast enough?	38	21	143	79
Do students get access to the computers?	29	16	152	84
Do teachers access the internet?	12	7	169	93
Are there plans to use computers for e-learning?	24	13	157	87
Are there any Learning Management Systems like Educational software?	83	46	98	52

(n=181)

Source: Research data (2023)

LMS features have been recognized as one of the issues impelling the facilitation of online learning in high schools in the Sub-County of Naivasha, Kenya. Research aims at establishing this claim. Therefore, respondents were requested to rate their responses on a Likert scale of 1 to 2 where : (1) Yes (2) No. Analysis of Table 4.10 indicates that the majority (82.9%) with the agreed that students do not have access to computers.

This is closely followed by all learning management systems such as educational software (98%). Consequently, many of those who responded agreed that teachers do not have Internet access, and will not use computers for online learning (93%).

Caliris (2014) concluded that the use of computers was projected by intents of its use and its perceived usefulness. Positive attitude towards LMS use by the teachers, ensures that they can seamlessly offer progressive insights on e-learning facilitation which consequently benefit the learners who then gets motivated, support e-learning and support each other by practising and learning together.

4.8 Relationship between Organizational Culture and e-learning Facilitation

The research's third objective of the study was to deduce the relationship between organizational culture and the support of e-learning in high schools in Sub-County of Naivasha, Kenya. Respondents were asked to express their degree of their agreement with statements regarding the relationship between organizational culture and online learning facilitation in high schools in Naivasha Sub-County, Kenya. The findings are tabulated in Table 4.15.

4.8.1 Descriptive Statistics of Organizational Culture

Table 4.15 shows descriptive statistic on Organizational Culture and e-learning facilitation.

Table 4.15: Relationship between Organizational Culture and e-learning Facilitation

Statements	SA		A		SWA		D		SD		Mean	Std v
	F %		F %		F %		F %		F %			
E-learning can improve the level of education in the school	11	5	55	26	54	27	46	22	15	7	3.01	1.06
E-learning will make learning more interesting	11	5	66	31	53	25	39	19	12	6	3.14	1.03
There is lack of opportunity to train and learn technology	36	17	81	39	44	21	12	6	8	4	3.69	1.01
Psychologically students are ready to start E-learning	32	15	101	48	32	15	12	6	4	2	3.80	.88
Mentally, teachers are ready to use ICT in e-learning	33	16	77	37	44	21	19	9	8	4	3.59	1.04
Computers are hard and frustrating to use	7	3	73	35	51	24	31	15	19	9	3.09	1.07
Our school has plans to install ICT infrastructure	10	5	77	37	39	19	39	19	16	8	3.14	1.09
I would appreciate if my school sends me for a e-learning course	18	9	83	40	49	23	27	13	4	2	3.46	.93
I waste a lot of time try to work with computers	33	16	88	42	44	21	8	4	8	4	3.71	.96
The ICT technical support is adequate to support e-learning	14	7	66	31	53	25	28	13	20	10	3.14	1.12
Students have sufficient computer skills to enable e-learning	14	7	88	42	55	26	8	4	16	8	3.42	1.01
There is sufficient computer literacy level among the teachers	18	9	51	24	69	33	27	13	16	8	3.15	1.07
It is important to learn about e-learning in this age and time	10	5	66	31	60	29	30	14	15	7	3.14	1.03

(n=181, Average Mean=3.34)

Source: Research data (2023)

Organizational culture is recognized as one of the factors impelling the facilitation of e-learning in secondary schools in Naivasha Sub-County, Kenya. Research aimed to establish this claim. Therefore, respondents were required to rate their answers on a Likert scale from 1 to 5 where: 5=Strongly agree; 4= Agree; 3= Tend to agree; 2=I disagree; 1=Strongly disagree. Analysis of Table 4.15 shows that most of those with the highest GPA (3.80) and S.D (0.88) agreed that students are psychologically ready to start learning online. This is followed by a lack of technology training and learning opportunities with mean (3.69) and S.D (1.01). In addition, many respondents agreed that instructors are mentally ready to use ICT in e-learning with a mean of (3.59) and a S.D of (1.04), and I waste a lot of time trying to work with a calculator whose mean is (3.71) and S.D is (0.96). The student has sufficient computer skills to achieve an online learning average of (3.42) and S.D.(1.01). Private institution entrepreneurs expected to facilitate e-learning external modes of education in their training institutes may eventually be edged out of business or face acute drop in profits as many parents would transfer their children to the cheaper public schools offering e-learning. Further, because e-learning inspires students to learn on their own, in-class teaching would by and by be faced out. Hence they may purport to promote e-learning but at the same time sabotage it by insisting on dependency on teachers.

Charak (2019) states; positive or negative attitudes emanate from the society; educators, religious and political leaders parents and learners. How the society perceives e-learning as not being any better than one on one teaching and interrogating the e-learning courses credibility trickles down to the classroom as learners are part of the society as they do borrow attitude from their homes. The political class can deliberately prioritize and enable e-learning buy passing debates that supports the enactment of e-learning and purchase of LMS. People in authority are key when it comes influencing

attitudes to juniors. For instance at a school level the administrators need to embrace e-learning for its facilitation to manifest. In Kenya, politicians who also happen to be the lawmakers may choose to or not to pass bills supporting e-learning and especially where funding is involved.

Regardless of availability of educational software, computer laboratories, internet connection, speedy growth in ICT, internet access by students and teachers in schools and homes, considerably enhanced learning institutions and ICT infrastructure, a number of teachers are reluctant in usage and adoption of e-learning (Wepsi, 2015). Many teachers in Kenya, having been used to pen and paper method of assessment may want the status quo to remain. This can likely be attributed to resisting change brought about by ignorance. The schools' administration led by the head should endeavour to have the teachers educated on the immense benefits of e-learning. The teachers can consequently pass same knowledge and appreciation to the students. Teachers however are different when it comes to perception, perception also varies in degree and thus generalization doesn't give the true picture.

4.9 Relationship between ICT expertise and e-learning Facilitation

The fourth objective of the research was to ascertain the relationship between IT expertise and the support of online learning in secondary schools in Naivasha Sub-County, Kenya. Respondents were asked to express the degree to which they are in agreement with statements concerning the relationship between organizational culture and online learning facilitation in high schools in the Sub-County of Naivasha, Kenya. The result findings are tabulated in Table 4.16.

4.9.1 Descriptive Statistics of ICT expertise

Table 4.16 shows descriptive statistic on ICT expertise and e-learning facilitation.

Table 4.16 Relationship between ICT expertise and e-learning Facilitation

Statements	N A		N V		N		W		V W		Mean	Stdv
	F	%	F	%	F	%	F	%	F	%		
I am able to create a new document using Microsoft Word	-	-	-	-	15	8	94	52	72	40	4.31	.61
I am able to create a table using Microsoft Excel	-	-	-	-	5	3	99	55	77	43	4.39	.54
I am able print a document	2	2	-	-	5	3	79	44	93	51	4.41	.75
I am able to direct open a web address	5	3	-	-	18	10	85	47	73	40	4.24	.74
I can send and receive e-mails messages	-	-	-	-	5	3	97	54	79	38	4.40	.56
I am able to send an e-mail with and attach a file.	-	-	-	-	5	3	73	40	10 3	49	4.54	.55
I am able to access my online payslip and file tax return	-	-	-	-	24	13	97	46	60	29	4.19	.65
I have the basic computer skills tto enable me use use search engines to type and search information	-	-	-	-	14	8	96	53	71	39	4.31	.61
I can use a browser such as chrome and Mozilla To search the World Wide Web.	-	-	-	-	5	3	80	44	96	53	4.50	.55

(n=181, Average Mean=3.04)

Source: Research data (2023)

ICT expertise has been accredited to be one of the influences of e-learning facilitation in secondary schools in Naivasha Sub-County, Kenya. The study sought to confirm that claim. Therefore, the respondents were required to do a rating of their feedback on a likert scale of 1-5 where: (1) =Not at All (2) =Not Very Well (3) = Neutral (4) =Well

(5) =Very Well. The analysis in table 4.13 shows that the most of those hat; I am able to send an e-mail with and attach a file very well. This was followed by; I can use a browser such as chrome and Mozilla to search the World Wide Web with a mean of (4.50) and a standard deviation of (0.55). Furthermore respondents agreed they waste a lot of time try to work with computers at a mean of (4.40) and a standard deviation of (0.56). I can send and receive e-mails messages mean of (4.40) and a standard deviation of (0.56).

Pardamean and Suparyanto (2014) argues that, there is an evident correlation between students' achievements and their computer skills. Students with better computer skills perform better as they are able to do personal research and are more confident. E-learning cannot be carried out without the necessary computer skills among the teacher and the learners. The learner and the teacher must be involved for learning to have taken place. When the teacher sends homework to the learner by mail the learner must have the knowhow to be able to respond through the same online means.

In their study on systematic approach in improving e-learning is secondary schools in Indonesia, Pardamean and Suparyanto (2014) argue that, there is an evident correlation between students' achievements and their computer skills. Students with better computer skills perform better as they are able to do personal research and are more confident. E-learning cannot be carried out without the necessary computer skills among the teacher and the learners. The learner and the teacher must be involved for learning to have taken place. When the teacher sends homework to the learner by mail the learner must have the knowhow to be able to respond through the same online means. The researcher however did not indicate or explain the scale measure for the 'better computer skills'; how is a student with better computer skills identified? The

much that learners can achieve in their learning with just basic computer skills. Measures on how to improve teachers and learners computer skills were also not identified. Parents input is also key as they do step up and assist learners with the homework and thus they too need to have basic ICT skills.

Mingaine (2013) in a research he conducted on leadership skills on ICT execution, he looked at teachers' skills that had an influence on the ICT adoption process and its use in public high schools in Kenya. The study's results concluded that skilled ICT teachers in Kenya are not enough. Public secondary schools need enough ICT trained teachers to teach and train both students and teachers. Teachers teaching other subjects require ICT skills in order to enable e-learning facilitation and to also train their students to enable them effectively handle online learning hence facilitating e-learning. The research focussed on public high schools while private secondary schools were left out. Another notable gap is that the study did not give data for specific counties.

E-learning can make it much easier to access the teachers away from the normal working hours, for instance by web-based or e-mail forums of discussion. In day schools, learners can continue learning at home after breaking for home in the evening, sick and disabled learners can able to continue learning and receive instructions from the teachers from the comfort of their homes.

In a study done by Arifin, Mathematics Creative Thinking Skills, e-learning has the ability have the interest of the learners by bringing back learners' curiosity back to education (Arifin, Suyitno & Dewi, 2020). Learning with computers makes learning interesting as it kills normal in-classroom monotony. Use of power-point slides, videos and computer animations to give movement and sound to immobile textbook and have students' classes livelier especially in subjects like sciences and mathematics. Arifin also claims that the internet has plentiful websites that are helpful teachers to advance

and progress lessons, obtain information, exchange of ideas and get free simulations and animation to make their lessons more interesting. However the researcher only did a study on the subject of mathematics. Being a global village the professionals of the nations of the world should always try to catch up with their developed peers. To gain higher digital literacy levels of the students in learning institutions, Institutions of learning and their governments are putting more efforts by initiating e-learning environments. Both the advanced and developing nations are deliberately figuring out a required digital literacy curriculum for the learners' and teachers' training.

4.10 Descriptive Statistics of E-learning facilitation

The study's respondents were asked to illustrate the extent to which they agree with the questionnaires' proclamations in relation to e-learning facilitation. The outcomes are tabulated in table 4.17 below.

Table 4.17: Descriptive Statistics for E-learning facilitation

	N	Mean	Std. Deviation
I do communicate using email address	181	3.04	1.16
I do give students homework via email	181	3.36	.48
I use word application to write lesson plan, Schemes of work, and type exams.	181	2.18	1.33
I use excel worksheets to make a time table, attendance records, exam results and analysis.	181	3.05	1.17
I use a database applications to keep personal And student's records.	181	2.62	1.31
I produce notes, teaching aids hand-outs using a Desktop publisher.	181	2.11	.78
I use PowerPoint for presentation During lessons.	181	3.18	.57
I use printers, scanners and photocopiers to In production of learning materials.	181	2.07	1.10
I use computer to create tables, upload images, and draw diagrams	181	2.01	1.35
I use internet to source teaching and learning materials	181	2.62	1.30
I exchange teaching and learning materials with my Colleagues using the Email.	181	2.01	.73
I use materials from flash discs, memory chips, in my lessons.	181	2.31	.54
Aggregate Mean and Standard Deviation		4.19	0.72

Source: Researcher (2023)

The analysis in table 4.17 does indicate that the majority who recorded the highest mean of 3.36 and a standard deviation of 0.48 agreed with the statement 'I do give students homework via email. This was narrowly trailed by those who too agreed that I use PowerPoint for presentation during lessons. A mean of (3.18) and a standard deviation of (0.57). Moreover, respondents agreed I use excel tables to make a time table, records of attendance, examination grades and analysis a mean of (3.05) and a standard deviation of (1.17). I do communicate using email address at a mean of (3.04) and a standard deviation of (1.16).

4.11 Inferential Statistics

4.11.1. Simple Regression of ICT Infrastructure

The research purposed in establishment the relationship between IT infrastructure and online learning support using Pearson correlation. The results are tabulated in Table 4.18.

Table 4.18: Correlation between ICT Infrastructure and E-learning Facilitation

		E-learning facilitation	ICT Infrastructure
E-learning facilitation	Pearson Correlation	1	.471 **
	Sig. (2-tailed)		.000
	N	181	181
ICT Infrastructure	Pearson Correlation	.471 **	1
	Sig. (2-tailed)	.000	
	N	181	181

Source: Research data (2023)

Correlation co-efficient $r = 0.471$, $p = .000$. This infers that there exists a weak positive connection between IT infrastructure and online learning facilitation in high schools in Naivasha Sub-County. This finding implies that IT infrastructure plays a role in supporting e-learning in high schools in the Sub-County of Naivasha. In his research on prediction of the intention web-based learning system use (Caliris, 2014) concluded that the use of computers was projected by intents of its use and its perceived usefulness. Positive attitude towards LMS use by the teachers, ensures that they can seamlessly offer progressive insights on e-learning facilitation which consequently benefit the learners who then gets motivated, support e-learning and support each other by practising and learning together.

The finding is in tandem with Mwakyusa (2016) recorded that the main inhibitions to successfully implementing e-learning in Tanzania was ICT infrastructure considering that e-learning success is dependent on tools of ICT like availability of sufficient computers to students and teachers. Thus, insufficient ICT infrastructure may leads to

inadequate access to technologies and inability to run the systems regularly. The researcher however generalized all learning institution in Tanzania colleges and secondary schools and all the infrastructure without being specific on power availability and connectivity, internet connectivity and availability of computers.

4.11.2. Simple Regression of LMS characteristics

The study aimed to get to know out the relationship between the cognitive characteristics of LMS and the facilitation of electronic learning using Pearson correlation. The results are shown in Table 4.19.

Table 4.19: Correlation between LMS characteristics and E-learning Facilitation

		E-learning facilitation	LMS characteristics
E-learning facilitation	Pearson Correlation	1	.439**
	Sig. (2-tailed)		.000
	N	181	181
LMS characteristics	Pearson Correlation	.439**	1
	Sig. (2-tailed)	.000	
	N	181	181

Source: Research data (2023)

Correlation coefficient $r = 0.439$, $p=.000$. This infers that there is a weak positive connection between LMS characteristics and online learning facilitation in secondary schools in Naivasha Sub-County, Kenya. This finding implies that LMS features are important in supporting online learning in high schools of Sub-County of Naivasha, Kenya.

Abdelraheem (2012) and Gedera (2014) were of the same opinion that LMS e-learning platforms are flexible technologies as they assist in; course content submission and course information management required by teachers when conducting online classes.

LMS's offer great environment enabling virtual teaching and learning, which is autonomous and free of time and space limitations (Kontogergos, 2016).

4.11.3. Simple Regression of Organizational Culture

The study aimed to establish the relationship between organizational culture and the support of e-learning in secondary schools in Naivasha sub-district, Kenya. The results are shown in Table 4.20.

Table 4.20: Pearson correlation

		E-learning facilitation	Organizational Culture
E-learning facilitation	Pearson Correlation	1	.482**
	Sig. (2-tailed)		.000
	N	181	181
Organizational Culture	Pearson Correlation	.482**	1
	Sig. (2-tailed)	.000	
	N	181	181

Source: Research Data (2023)

Correlation coefficient $r = 0.482$, $p (0.000) < 0.5$. This infers that there is an average relationship between organizational culture and online learning facilitation in secondary schools in the sub county of Naivasha, Kenya. This finding implies that organizational culture is important in facilitating online learning in secondary schools in Naivasha sub-district, Kenya.

A simple linear regression test was performed to determine the predictive power of organizational culture on supporting online learning in secondary schools in Naivasha Sub-County, Kenya, as shown in Table 4.20.

4.11.4. Simple Regression of ICT expertise

The study sought to establish the relationship between the ICT expertise and e-learning facilitation in secondary schools in Naivasha Sub County, Kenya. The findings are presented in Table 4.21.

Table 4.21: Pearson correlation

		E-learning facilitation	ICT expertise
E-learning facilitation	Pearson Correlation	1	.157*
	Sig. (2-tailed)		.035
	N	181	181
ICT expertise	Pearson Correlation	.157*	1
	Sig. (2-tailed)	.035	
	N	181	181

Source: Research Data (2023)

The correlation coefficient $r = 0.157$, $p(0.000) < 0.5$. This implies that there is a weak positive relationship between ICT expertise and E-learning facilitation in secondary schools in Naivasha Sub County, Kenya. This conclusion implies that ICT expertise is important in E-learning facilitation e-learning facilitation in secondary schools in Naivasha Sub County, Kenya.

Simple Linear regression test was used in determination of predictive power of ICT expertise on E-learning facilitation in secondary schools in Naivasha Sub County, Kenya as shown in Table 4.21.

E-learning can make it much easier to access the teachers away from the normal working hours, for instance by web-based or e-mail forums of discussion. In day schools, learners can continue learning at home after breaking for home in the evening, sick and disabled learners can able to continue learning and receive instructions from the teachers from the comfort of their homes.

In a study done by Arifin, Mathematics Creative Thinking Skills, e-learning has the ability have the interest of the learners by bringing back learners' curiosity back to education (Arifin, Suyitno & Dewi, 2020). Learning with computers makes learning interesting as it kills normal in-classroom monotony. Use of power-point slides, videos and computer animations to give movement and sound to immobile textbook and have students' classes livelier especially in subjects like sciences and mathematics. Arifin also claims that the internet has plentiful websites that can assist teachers in advancing and progressing lessons, obtain information, exchange of ideas and get free simulations and animation to make their lessons more interesting. However the researcher only did a study on the subject of mathematics.

4.12 Overall Regression Model

4.12.1 Relationship between Independent Variables

Table 4.22: Relationship between Independent Variables

		Correlations				
		E-learning facilitation	ICT Infrastructure	LMS Characteristics	Organizational Culture	ICT Expertise
E-learning facilitation	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	181				
ICT Infrastructure	Pearson Correlation	.471**	1			
	Sig. (2-tailed)	.000				
	N	181	181			
LMS Characteristics	Pearson Correlation	.439**	.799**	1		
	Sig. (2-tailed)	.000	.000			
	N	181	181	181		
Organizational Culture	Pearson Correlation	.482**	.567**	.712**	1	
	Sig. (2-tailed)	.000	.000	.000		
	N	181	181	181	181	
ICT Expertise	Pearson Correlation	.157*	-.014	-.013	.098	1
	Sig. (2-tailed)	.035	.857	.860	.189	
	N	181	181	181	181	181

Source: Research Data (2023)

The outcomes in the table 4.22 indicates existence of a positive relationship between ICT Infrastructure and e-learning facilitation in high schools in Naivasha Sub-County, Kenya at significant 0.05 level, the strength is at 47.1 percent. Same results show that there a positive correlation between LMS Characteristics and e-learning facilitation in high schools in Naivasha Sub-County, Kenya at significant 0.05 level, the strength is weak, at 43.9 percent. The findings goes on to imply that there is a positive correlation

between Organizational Culture and e-learning facilitation significant 0.05 level, the strength is average, at 48.2 percent. Moreover, there is a positive correlation between ICT Expertise and e-learning facilitation significant 0.05 level, the strength is though weak, at 15.7 percent.

4.12.2 Relationship between Dependent and Independent Variables

Table 4.23: Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.555 ^a	.308	.292	.37901

a. Predictors: (Constant), ICT Infrastructure, LMS Characteristics, Organizational Culture, ICT Expertise

b. Dependent Variable: E-learning facilitation.

Source: Research Data (2023)

Referring to table 4.23 the research establishes the adjusted R square to be 0.292 implying that 29.2 percent, of E-learning facilitation in secondary schools in Naivasha Sub-County, Kenya was elucidated by ICT Infrastructure, LMS Characteristics, Organizational Culture, and ICT Expertise. With 70.8 percent unexplained, it implied that other factors namely; external factors had high influence on the e-learning facilitation. Hence, in addition research should be conducted to discover the external factors in the Sub-County. The findings are in tandem with Goh and Yang (2021) that equally got a low r² of 39.1%, by studying the role of engagement and flow on the continuation with a learning management system in a blended learning environment.

Table 4. 24: Relationship between Independent Variables

ANOVA ^a						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11.230	4	2.807	19.545	.000 ^b
	Residual	25.282	176	.144		
	Total	36.512	180			

a. Dependent Variable: E-learning facilitation

b. Predictors: (Constant), ICT Infrastructure, LMS Characteristics, Organizational Culture, ICT Expertise

Source: Research Data (2023)

The probability value of $p < .05$ points that the regression model can be used to forecast how ICT Infrastructure, LMS Characteristics, Organizational Culture, ICT Expertise influence of E-learning facilitation in high schools in Naivasha Sub-County, Kenya.

Table 4.25: Relationship between Dependent and Independent Variables

Model	Coefficients				
	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	T	
(Constant)	2.185	.431		5.075	.000
ICT Infrastructure	.185	.058	.336	3.221	.002
1 LMS Characteristics	-.028	.066	-.053	-.428	.669
Organizational Culture	.201	.057	.316	3.494	.001
ICT Expertise	.196	.096	.130	2.045	.042

a. Dependent Variable: E-learning facilitation.

Source: Research Data (2023)

Specifically, organizational culture has the highest positive influence on e-learning facilitation, followed by ICT Expertise and ICT Infrastructure. The predictor variables individual significance was tested using t-test. The findings confirms that Organizational Culture, ICT Expertise and ICT Infrastructure were individually

statistically significant related to E-learning facilitation; p-value<0.05, however LMS Characteristics, was insignificant. Caliris (2014) concluded that the use of computers was projected by intents of its use and its perceived usefulness. Positive attitude towards LMS use by the teachers, ensures that they can seamlessly offer progressive insights on e-learning facilitation which consequently benefit the learners who then gets motivated, support e-learning and support each other by practising and learning together.

Pang, (2015) opined that, one of the main determiner of effective incorporation of ICT's is leadership, the school principals and members of the school board are key decision makers in how the school is run. Other than overseeing daily activities in the institutions, school heads are also obligated to ensure that learning and performance of students is up to standard.

$$Y = 2.185 + .185X_1 + .201 + 196X_3$$

Where;

Y= E-learning facilitation **2.185**= Constant term, **X₁**= ICT Infrastructure, **X₂**= Organizational Culture, **X₃**= ICT Expertise

The findings reveal that Organizational Culture, ICT Expertise and ICT Infrastructure were independently factually altogether related to e-learning facilitation; p-value<0.05. Subsequently all the hypotheses were rejected. The negative value of LMS Characteristics imply that the secondary schools have not fully integrated LMS Characteristics in E-learning facilitation.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter a presentation of the summary, conclusions and recommendations of the study centred on the findings of the research and research interpretation is done. In addition, the researcher makes proposals for other areas of research. This chapter concludes by presenting the policy and practical implications of the findings of research.

5.2 Summary of the Study

The main objective of the study was aimed at determining the effect of learning management systems' considerations on the facilitation of e-learning in high schools in Naivasha Sub-County, Nakuru County, Kenya. Specifically, the study aimed to establish the relationship between IT infrastructure and supporting e-learning in secondary schools; establish the relationship between LMS features and online learning support in high school; establishing the relationship between organizational culture and supporting online learning in high school; establishing the relationship between IT expertise and online learning support in secondary schools in Naivasha Sub-County, Nakuru County, Kenya.

The study uses descriptive researches design because it is appropriate for the researcher to get content explaining the current state by inquiring from someone about their views, attitudes, behaviours, and values.

The proposed study was carried out in Naivasha Sub-County, Nakuru-County, Kenya. The subjects of this study included 61 principals and 806 secondary school teachers from Naivasha Sub-County, Nakuru County, Kenya. Search engines have been tested and retested to improve their reliability. Validity was ensured by seeking guidance from an academic supervisor. Purposeful sampling was also used to select managers and

supervisors. Stratified random sampling was used to classify respondents. Analysis of data was performed using the SPSS computer software version 23.0 due to its efficiency and effectiveness in analysing huge amounts of data.

Nonetheless, it was asserted that ICT Infrastructure has a positive significant relationship with e-learning facilitation. In a school, ICT infrastructure availability is a pointer to an environment conducive for e-learning as learning cannot happen in a vacuum. The teachers need enough computers, power connection cables, reliable internet connections and the necessary online learning applications installed in those computers. The learners on the other hand will need computer gadgets and smart phones at home fully installed with the online learning applications students and teachers will be able to seek more knowledge about e-learning even without being pushed around.

It was found that LMS Characteristics was satisfactory and e-learning facilitation the majority of those who recorded the highest mean this finding established that LMS characteristics play a major role in e-learning. Conversely, it was believed to have had a negative but insignificant relationship with e-learning facilitation at 5 percent degree of significance. LMS use by the teachers, ensures that they can seamlessly offer progressive insights on e-learning facilitation which consequently benefit the learners who then gets motivated, support e-learning and support each other by practising and learning together.

It was concluded that organizational culture, and e-learning facilitation. Majority of those that scored the uppermost mean of (3.80) and a standard deviation of (0.88) agreed that psychologically students are ready to start e-learning. Nonetheless, it was concluded to having a positive significant relationship with e-learning facilitation (at 5 percent level of impact. Private institution entrepreneurs expected to facilitate e-learning external modes of education in their training institutes may eventually be

edged out of business or face acute drop in profits as many parents would transfer their children to the cheaper public schools offering e-learning. Further, because e-learning inspires students to learn on their own, in-class teaching would by and by be faced out. Hence, they may purport to promote e-learning but at the same time sabotage it by insisting on dependency on teachers.

It was found that ICT expertise e-learning facilitation. Most of the people who scored the highest mean agreed that ‘I am able to send an e-mail with and attach a file very well’. Nevertheless, it was found to have a positive significant relationship with e-learning facilitation. Being a global village the professionals of the nations of the world should always try to catch up with their developed peers. To gain higher levels of digital literacy of the students in learning institutions, Institutions of learning and their governments are putting more efforts by initiating e-learning environments. Both the advanced and developing nations are deliberately figuring out a required digital literacy curriculum for the learners’ and teachers’ training.

5.3 Conclusion

5.3.1 ICT Infrastructure and e-learning Facilitation

The first objective was to establish the relationship between ICT infrastructure and e-learning facilitation in high in Naivasha Sub-County, Nakuru County, Kenya. The study found out that ICT infrastructure influences e-learning facilitation to a major extent and thus study concludes that ICT infrastructure is a key determinant of e-learning facilitation.

Despite the obvious benefits, difficulties such as limited infrastructure, insufficient training, and opposition to change impede the seamless integration of ICTs into tertiary education. Sustainable solutions necessitate collaborative efforts from governments,

educational institutions, and stakeholders. Adequate finance, comprehensive educational training programs, and strategic policies to encourage ICT usage are required. Furthermore, an emphasis on R&D can result in the development of innovative, context-specific ICT solutions, assuring the long-term transformation of tertiary education.

Thus, the role of ICTs in modernizing tertiary education is critical. ICTs help learners and society advance by improving accessibility, personalizing learning experiences, fostering collaboration, upgrading teaching methods, and preparing students for the digital economy. Addressing problems and guaranteeing the long-term integration of ICTs into tertiary education is critical for developing a future-ready workforce and promoting continual educational innovation.

5.3.2 LMS characteristics and e-learning Facilitation

The second objective was to establish the relationship between LMS Characteristics and e-learning facilitation in secondary in Naivasha Sub-County, Nakuru County, Kenya. The study established that LMS Characteristics influence e-learning facilitation in high in the Sub-County of Naivasha, Nakuru County, Kenya; therefore, study concludes that LMS Characteristics is insignificant predictor of e-learning facilitation in high schools in Naivasha Sub-County, Nakuru County, Kenya.

The primary purpose of an LMS is to easily distribute course content to learners. Choose an LMS that simplifies course authoring. A great LMS allows you to drag and drop content into position, making it simple to construct courses. MS automation eliminates repetitious administrative work, allowing you to spend lesser time micromanaging instruction. Many LMS will automatically add and remove users by interacting with your HR or CRM systems. You may also set up auto-enrolments based on parameters that match your students to the appropriate learning courses. Ensuring

that students are up to speed on their instruction is critical, especially if the course is mandated. For this, you'll need an LMS that delivers initiated notifications to learners about assigned learning courses and forthcoming due dates.

5.3.3 Organizational Culture and e-learning Facilitation

The third objective was to ascertain the relationship between organizational culture and e-learning facilitation in high schools in the Sub-County of Naivasha, Nakuru County, Kenya. The study established that organizational culture influence e-learning facilitation in secondary in Naivasha Sub-County, Nakuru County, Kenya. Therefore, study concludes that organizational culture is significant determinant of e-learning facilitation in high in Naivasha Sub-County, Nakuru County, Kenya.

Based on the outcomes of this study, it is determined that organizational culture influences e-learning preparedness. It is also determined that organizational culture can serve as a facilitator, or even a preventive, role in the e-learning process. Organizations with Clan or Adhocracy cultures are ready to implement e-learning. Cultural barriers to e-learning adoption include hierarchical and market-type societies. To stay competitive and cope with quick changes in information, schools that need to use e-learning should build a Clan and/or Adhocracy culture.

5.3.4 ICT Expertise and e-learning Facilitation

The fourth objective was to ascertain the relationship between ICT expertise and e-learning facilitation in secondary in Naivasha Sub-County, Nakuru County, Kenya. The study established that ICT expertise influence the e-learning facilitation in secondary in Naivasha Sub-County, Nakuru County, Kenya. Therefore, study concludes that ICT expertise is significant determinant of e-learning facilitation in high in Naivasha Sub-County, Nakuru County, Kenya.

Learners are continuously looking for flexibility in terms of timing, space, location, material choices, and instruction delivery. Previously, meeting such standards was nearly impossible due to a lack of appropriate instruments. It is evidently conceivable and practical to develop flexible and open learning methodologies using ICT tools. Flexible accessing of material and learning resources through network across traditional classrooms, homes, and town centres is a distinguishing feature of what has become known as dispersed learning. Web-based training relies on asynchronous and synchronous communication across geography, time, and pace to allow students to learn at any given time and from any locality.

With the advent of internet resources, it is now a possibility to construct websites content and online learning to supplement and aid face-to-face learning in a manner that is innovative. Communication via e-mail, looking for information, and finding a suitable website are now the keys to success. Creating resources; both offline and online with several learning management system software will be one of the leading working tools for today's teachers. Searching, identifying, and classifying information and knowledge via the internet has unlocked up new possibilities for the adoption of flexible learning methodologies.

5.4 Contribution to Knowledge

Previous studies considered influence of ICT in schools and in learning, but no study in Naivasha sub-county high schools specified on LMS, and e-learning. Previously studies were done on e-learning facilitation regarding mathematics, English or other particular subjects. Teachers teaching other subjects require ICT skills in order to enable e-learning facilitation and to also train their students to enable them effectively handle online learning hence facilitating e-learning .The presented study has thus contributed new knowledge by incorporating all subjects in the study.

Post Covid-19, many researchers studied influence on e-learning in schools. However, researchers did not explain how the schools were able to make a quick shift as e-learning requires infrastructure and technical logistics that would take a long time to facilitate. Thus this research has an overall view to e-learning facilitation in schools.

Some documented previous researches done on e-learning in high schools in Naivasha Sub County focused on public secondary schools leaving out private high schools, this very study covered both the public secondary schools and private secondary schools hence the findings are conclusive.

Students are increasingly aware of the limitations of using LMS software due to external factors such as insufficient limits and inadequate instructor competencies. The LMS application should be designed with teachers and students in mind. Teachers require training to enhance their ability to provide engaging and unique online learning experiences. The study identifies the impact of LMS on quality of education, making it beneficial and timely. The LMS system is used to track instructor and student performance. LMS allows instructors to be more creative and original in identifying methods, materials, and demonstrations using accessible resources.

E-learning is crucial for teacher education since it emphasizes both pedagogy and effective use of ICT. E-learning encompasses two concepts: the shift in pedagogy towards learning and the expansion of technology beyond traditional classrooms. E-learning for teacher improvement involves using electronic media (ICT) throughout the curriculum to enhance student learning. The goal is to integrate pedagogy and ICT for effective e-learning. There are plentiful of advantages to e-learning.

To actualize e-learning facilitation, students and teachers must have a positive attitude. However the previous study was not exhaustive as it was only done in ten

secondary schools. The present study had a target population of 61 schools that permits generalization of findings.

Different countries and counties in Africa are at different levels in ICT's considerations and e-learning facilitation and therefore the research need to be constricted to particular countries and counties. Therefore the present study is country specific and the findings addresses LMS and e-learning facilitation in high schools in the Sub-County of Naivasha, Nakuru County, Kenya.

5.5 Recommendations and policy implication

It is necessary to develop an e-learning policy for secondary schools. The policy should include all relevant elements to succinctly address issues associated to governance, education quality and training, implementation plans, rewards and motivations. Along with that, secondary schools should pay more attention on implementing and using e-learning in their strategic plan. These policies should thereafter be communicated to all the stakeholders, and any necessary changes should be considered as part of regular policy reviews.

Students had positive opinions and LMS characteristics satisfaction such as flexibility, interactivity, accessibility and the availability of learning materials. The reviewed literature discovered that LMS has a beneficial impact on students' achievement and perspectives; yet, some students have a negative perception because of technological challenges, limited engagement with professors, and insufficient assistance. To solve these challenges, researchers should combine quantitative and qualitative methodologies to achieve a thorough understanding. Institutions and teachers should give enough training and technical support to students, monitoring and assessing students' perception and satisfaction, and actively connect with students via the LMS.

Future studies should look on lasting effects of LMS use on student achievement and attitudes.

Training courses and seminars should be organized for all users and the high school management with content necessary for the target users. In order to improve the knowledge of student about e-learning and LMS, e-learning needs to be incorporated into the curriculum by providing a mandatory seminar to enhance students' knowledge of the subject e-learning and the use of LMS.

The Ministry in charge of education in Kenya should support training, which should include; the trainer's knowledge of LMS and e-learning, the trainer's attitude towards the LMS, and the trainer's communication skills as they are key aspects to be considered. School leaders should provide technical support to teachers, assisting them overcome economic, infrastructure and content creation challenges.

In addition, the education policy makers should implement action plans to reduce high Internet costs and provide uninterrupted electricity to people living in rural and urban areas. LMS inventors and administrators ought to follow user-centred design rules and guidelines to improve the availability, accessibility, reliability, and usability of system-based systems.

The Ministry in charge of education should support, fund and encourage teachers to conduct research on e-learning in various aspects to study the bottlenecks, opportunities, trends, current status and factors affecting the use of e-learning.

5.6 Suggestion for Further Research

Basing on the study's research findings it is suggested that due to the low R^2 values (29.2 per cent), which means that the other 70.8 per cent of the dependent variable (e-learning facilitation) being explained by the other factors, forthcoming in their studies, researchers should seek for the other factors that play a part in the higher e-learning

facilitation. Future studies should also look on the lasting effects of LMS use on student achievement and attitudes.

REFERENCES

- Aboagye, E., Yawson, J. A., & Appiah, K. N. (2021). COVID-19 and E-learning: The challenges of students in tertiary institutions. *Social Education Research*, 1-8.
- Adzharuddin, N. A., & Ling, L. H. (2013). Learning management system (LMS) among university students: Does it work. *International Journal of e-Education, e-Business, e-Management and e-learning*, 3(3), 248-252.
- Agarwal, A., Naidu, V. R., & Al Mamari, R. (2019) A Framework To Enhance Learning Experience in Flipped Classroom Based on Student Accountability Towards Active Participation. *EDULEARN19 Proceedings*, 1, 1569-1577
- Aguti, B. (2015). *A Model to facilitate effective E-learning in technology-enhanced learning environments within universities* (Doctoral dissertation, University of Southampton).
- Akkara, S., Anumula, V., & Mallampalli, M. (2020). Impact of whatsapp interaction on improving L2 speaking skills. *International Journal of Emerging Technologies in Learning (iJET)*, 15(3), 250-259.
- Alemu, B. M. (2015). Integrating ICT into Teaching-Learning Practices: Promise, Challenges and Future Directions of Higher Educational Institutes. *Universal journal of educational research*, 3(3), 170-189.
- Alenezi, A. (2020). The role of e-learning materials in enhancing teaching and learning behaviors. *International Journal of Information and Education Technology*, 10(1), 48-56
- Alfaleh, R., East, L., Smith, Z., & Wang, S. Y. (2023). Nurses' perspectives, attitudes and experiences related to e-learning: A systematic review. *Nurse Education Today*, 105800.
- Alharbi, O., & Lally, V. (2017). Adoption of e-learning in Saudi Arabian University education: Three factors affecting educators. *European Journal of Open Education and E-learning Studies*.
- Al-Hunaiyyan, A., Al-Sharhan, S., Alhajri, R., & Bimba, A. (2021). An integrated implementation framework for an efficient transformation to online education. *International Journal of Advanced Computer Science and Applications*, 12(4), 52-61.

- Alkandari, B. (2015). *An investigation of the factors affecting students' acceptance and intention to use e-learning systems at Kuwait University: developing a technology acceptance model in e-learning environments* (Doctoral dissertation, Cardiff Metropolitan University).
- Alkhaldi, T., Pranata, I., & Athauda, R. I. (2016). A review of contemporary virtual and remote laboratory implementations: observations and findings. *Journal of Computers in Education*, 3, 329-351.
- Al-Marroof, R. A. S., & Al-Emran, M. (2018). Student's acceptance of google classroom: An exploratory study using PLS-SEM approach. *International Journal of Emerging Technologies in Learning (Online)*, 13(6), 112.
- Alufohai, P. J., & Ibhafidon, H. E. (2015). Influence of teachers' age, marital status and gender on students' academic achievement. *Asian Journal of Educational Research*, 3(4).
- Ansong, E., Boateng, R., Boateng, S. L., & Anderson, A. B. (2017). The nature of E-learning adoption by stakeholders of a university in Africa. *E-learning and Digital Media*, 14(4), 226-243.
- Apulu, I. (2012). Developing a framework for successful adoption and effective utilization of ICT by SMEs in developing countries: A case study of Nigeria.
- Arifin, M., Suyitno, H., & Dewi N. (2020). Mathematics Creative Thinking Skills in Problem-Based E-learning Model. *Journal of Primary Education*, 9(5), 511-517.
- Arunachalam, T. (2019). An investigation on the role of perceived ease of use perceived use and self-efficacy in determining continuous usage intention towards an e-learning system. *The Online Journal of Distance Education and e-Learning*, 7(4), 268-276.
- Asongu, S. A., Anyanwu, J. C., & Tchamyu, V. S. (2019). Technology-driven information sharing and conditional financial development in Africa. *Information Technology for Development*, 25(4), 630-659.
- Awad, M., Salameh, K., & Leiss, E. L. (2019, April). Evaluating learning management system usage at a small university. In *Proceedings of the 2019 3rd International Conference on Information System and Data Mining* (pp. 98-102).
- Awidi, I. T., & Cooper, M. (2015). Using management procedure gaps to enhance e-learning implementation in Africa. *Computers & Education*, 90, 64-79.

- Bansak, C., & Starr, M. (2021). Covid-19 shocks to education supply: how 200,000 US households dealt with the sudden shift to distance learning. *Review of Economics of the Household*, 19(1), 63-90.
- Bariham, I., Ondigi, S. R., & Kiio, M. (2021). Preparedness of Ghanaian senior high school instructors for application of online learning in social studies instruction amid the Covid-19 pandemic. *Social Education Research*, 52-64.
- Basir, M., Ali, S., & Gulliver, S. R. (2021). Validating learner-based e-learning barriers: developing an instrument to aid e-learning implementation management and leadership. *International Journal of Educational Management*, 35(6), 1277-1296
- Bhardwaj, A., Nagandla, K., Swe, K. M. M., & Abas, A. B. L. (2015). Academic staff perspectives towards adoption of e-learning at melaka manipal medical college: Has e-learning redefined our teaching model? *Kathmandu University medical journal*, 13(1), 12-18.
- Bringman-Rodenbarger, L., & Hortsch, M. (2020). How students choose E-learning resources: The importance of ease, familiarity, and convenience. *Faseb Bioadvances*, 2(5), 286.
- Buabeng-Andoh, C. (2012). An Exploration of Teachers' Skills, Perceptions and Practices of ICT in Teaching and Learning in the Ghanaian Second-Cycle Schools. *Contemporary Educational Technology*, 3(1).
- Calisir, F., Altin Gumussoy, C., Bayraktaroglu, A. E., & Karaali, D. (2014). : Perceived content quality, anxiety, perceived system quality, image, and the technology acceptance model. *Human Factors and Ergonomics in Manufacturing & Service Industries*, 24(5), 515-531.
- Cener, E., İsmail, A. C. U. N., & Demirhan, G. (2015). The impact of ICT on pupils' achievement and attitudes in social studies. *Journal of Social Studies Education Research*, 6(1), 190-207.
- Cheawjindakarn, B., Suwannatthachote, P., & Theeraroungchaisri, A. (2013). Critical success factors for online distance learning in higher education: A review of the literature. *Creative Education*, 3(08), 61.
- Chebunet, P. K., Abonyo, J. C. L., & Manduku, J. G. (2012). Determining the Relationship between the Gender-based Differences in the Leisure Time Activities of Boys and Girls and the Performance of English. *International Journal of Business and Social Science*, 3(16).

- Cheok, M. L., Wong, S. L., Ayub, A. F., & Mahmud, R. (2017). Teachers' Perceptions of E-Learning in Malaysian Secondary Schools. *Malaysian Online Journal of Educational Technology*, 5(2), 20-33.
- Cheok, M. L., Wong, S. L., Ayub, A. F., & Mahmud, R. (2017). Teachers' Perceptions of E-Learning in Malaysian Secondary Schools. *Malaysian Online Journal of Educational Technology*, 5(2), 20-33.
- Choudhury, S., & Pattnaik, S. (2020). Emerging themes in e-learning: A review from the stakeholders' perspective. *Computers & Education*, 144, 103657.
- Collins, A., & Halverson, R. (2018). *Rethinking education in the age of technology: The digital revolution and schooling in America*. Teachers College Press.
- Coman, C., Țîru, L. G., Meseșan-Schmitz, L., Stanciu, C., & Bularca, M. C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. *Sustainability*, 12(24), 10367.
- Corwin Press. Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Education and information technologies*, 25(6), 5261-5280.
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5-22.
- Dias, S. B., & Diniz, J. A. (2014). Towards an enhanced learning management system for blended learning in higher education incorporating distinct learners' profiles. *Journal of Educational Technology & Society*, 17(1), 307-319.
- Ephraim, O. T. (2019). *Digital Literacy: A Review of Teacher Education in Nigeria*. LAP LAMBERT Academic Publishing.
- Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & education*, 59(2), 423-435.
- Faboya, O. T., & Adamu, B. J. (2017). Integrating web 2.0 tools into teaching and learning process through mobile device technology in Nigerian schools: Current status and future directions. *International Journal of Education and Research*, 5(5), 113-124.

- Fayomi, O., Ayo, C., Ajayi, L., & Okorie, U. (2015). The impacts of e-learning in facilitating academic performance among private secondary schools and tertiary institutions in Ota, Ogun State, Nigeria. In *INTED2015 Proceedings* (pp. 7441-7447). IATED.
- Fayomi, O., Ayo, C., Ajayi, L., & Okorie, U. (2015). The impacts of e-learning in facilitating academic performance among private secondary schools and tertiary institutions in Ota, Ogun State, Nigeria. In *INTED2015 Proceedings* (pp. 7441-7447). IATED.
- Filippidi, A., Tselios, N., & Komis, V. (2010). Impact of Moodle usage practices on students' performance in the context of a blended learning environment. *Proceedings of Social Applications for Life Long Learning*, 2-7.
- Gathumbi, A., Ayot, H., Kimemia, J., & Ondigi, S. (2015). Teachers' and School Administrators' Preparedness in Handling Students with Special Needs in Inclusive Education in Kenya. *Journal of Education and Practice*, 6(24), 129-138.
- Glewwe, P. W., Hanushek, E. A., Humpage, S. D., & Ravina, R. (2011). School resources and educational outcomes in developing countries: A review of the literature from 1990 to 2010.
- Goo, J. L., Sariah, U. N., Jaafar, H. J., Noraini, M. B., Yusoff, W. S., & Ramish, M. S. (2021).
- Greenstein, L. M. (2012). *Assessing 21st century skills: A guide to evaluating mastery and authentic learning*.
- Hadullo, K., Oboko, R., & Omwenga, E. (2017). A model for evaluating e-learning systems quality in higher education in developing countries. *International Journal of Education and Development using ict*, 13(2).
- Haji, H. A., Shaame, A. A., & Kombo, O. H. (2013, September). The opportunities and challenges in using mobile phones as learning tools for Higher Learning Students in the developing countries: Zanzibar context. In *2013 Africon* (pp. 1-5). IEEE.
- Heale, R., & Twycross, A. (2015). Validity and reliability in quantitative studies. *Evidence-based nursing*, 18(3), 66-67.

- Jadhav, R. D., & Charak, K. S. (2019). E-LEARNING METHODS: EDUCATION 2.0. *Advance and Innovative Research*, 6(1), 80.
- Jahjouh, Y. M. A. (2014). The effectiveness of blended e-learning forum in planning for science instruction. *Journal of Turkish Science Education*, 11(4), 3-16.
- Kabundula, P. (2017). *Experiences of teachers and learners in the teaching and learning of computer studies at grade 9 level in selected secondary schools in Luanshya district, Zambia* (Doctoral dissertation, The University of Zambia).
- Kasim, N. N. M., & Khalid, F. (2016). Choosing the right learning management system (LMS) for the higher education institution context: A systematic review. *International Journal of Emerging Technologies in Learning*, 11(6).
- Kerras, N., & Essayahi, M. L. B. (2022). Education and COVID-19: Learning Arabic language and perspectives. *Electronic Journal of E-learning*, 20(1), pp36-52.
- Kibuku, R. N., Ochieng, D. O., & Wausi, A. N. (2020). E-Learning Challenges Faced by Universities in Kenya: A Literature Review. *Electronic Journal of e-Learning*, 18(2), pp150-161.
- Kirimi, K. J. (2014). Impact of information communication technology on education-Kenya. *Journal of Educational and Social Research. MCSER Publishing, Rome-Italy*, 4(1).
- Kisirkoi, F. K. (2015). Integration of ICT in education in a secondary school in Kenya: A case study.
- Kong, S. C. (2019). Partnership among schools in e-Learning implementation: Implications on elements for sustainable development. *Journal of Educational Technology & Society*, 22(1), 28-43.
- Kong, S. C., Chan, T. W., Griffin, P., Hoppe, U., Huang, R., Kinshuk, & Yu, S. (2014). E-learning in school education in the coming 10 years for developing 21st century skills: Critical research issues and policy implications. *Journal of Educational Technology & Society*, 17(1), 70-78.
- Kraleva, R., Sabani, M., & Kralev, V. (2019). An analysis of some learning management systems. *International Journal on Advanced Science, Engineering and Information Technology*, 9(4), 1190-1198.

- Kundu, A., & Bej, T. (2021). COVID-19 response: students' readiness for shifting classes online. *Corporate Governance: The International Journal of Business in Society*, 21(6), 1250-1270
- Lacan, J., Sheridan, A., & Bowie, M. (2020). The function and field of speech and language in psychoanalysis. In *Écrits: A selection* (pp. 33-125). Routledge.
- Lawrence, J. E., & Tar, U. A. (2018). Factors that influence teachers' adoption and integration of ICT in teaching/learning process. *Educational Media International*, 55(1), 79-105.
- Little, T. D. (Ed.). (2014). *The Oxford handbook of quantitative methods* (Vol. 1). Oxford University Press, USA.
- Liu, X., & Pange, J. (2015). Early childhood teachers' perceived barriers to ICT integration in teaching: a survey study in Mainland China. *Journal of Computers in Education*, 2(1), 61-75.
- Mashau, P., & Nyawo, J. C. (2021). The use of an online learning platform: A step towards e-learning. *South African Journal of Higher Education*, 35(2), 123-143.
- Micha, R. (2019). *The Current and Future State of LMS* (Doctoral dissertation, Master Thesis. Aristotle University of Thessaloniki).
- Mikre, F. (2011). The roles of information communication technologies in education: Review article with emphasis to the computer and internet. *Ethiopian Journal of Education and Sciences*, 6(2), 109-126.
- Mingaine, L. (2013). Challenges encountered by Principals during implementation of ICT in public secondary schools, Kenya. *Journal of Sociological Research*, 4(2), 1.
- Mingaine, L. (2013). Leadership Challenges in the Implementation of ICT in Public Secondary Schools, Kenya. *Journal of education and learning*, 2(1), 32-43.
- Mohajan, H. K. (2018). Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, 7(1), 23-48.

- Mohajan, H. K. (2020). Quantitative research: A successful investigation in natural and social sciences. *Journal of Economic Development, Environment and People*, 9(4), 50-79.
- Morze, N., Varchenko-Trotsenko, L., Terletska, T., & Smyrnova-Trybulska, E. (2021, March). Implementation of adaptive learning at higher education institutions by means of Moodle LMS. In *Journal of Physics: Conference Series* (Vol. 1840, No. 1, p. 012062). IOP Publishing.
- Msomi, A. P., & Hoque, M. (2018, November). The role of stakeholders for E-learning success in higher education. In *European Conference on e-Learning* (pp. 679- XVII). Academic Conferences International Limited.
- Mukuna, T. E. (2013). Integration of ICT into teacher training and professional development in Kenya. *Makerere journal of higher education*, 5(1), 3-21.
- Mwakyusa, W. P., & Mwalyagile, N. V. (2016). Impediments of E-learning Adoption in Higher Learning Institutions of Tanzania: An Empirical Review. *Journal of Education and Practice*, 7(30), 152-160
- Nchunge, D. M., Sakwa, M., & Mwangi, W. (2012). User's perception on ICT adoption for education support in schools: a survey of secondary school teacher's in Thika district Kenya. *International Journal of Humanities and Social Science*, 2(10), 17-29.
- Ngamau, K. (2013). *Factors affecting effective adoption of e-learning in Kenyan Universities: The case of Jomo Kenyatta University of Agriculture and Technology* (Doctoral dissertation, United States International University-Africa).
- Noor-Ul-Amin, S. (2013). An effective use of ICT for education and learning by drawing on worldwide knowledge, research, and experience. *ICT as a Change Agent for Education. India: Department of Education, University of Kashmir*, 1-13.
- Nortvig, A. M., Petersen, A. K., & Balle, S. H. (2018). A Literature Review of the Factors Influencing E-learning and Blended Learning in Relation to Learning Outcome, Student Satisfaction and Engagement. *Electronic Journal of E-learning*, 16(1), pp46-55.

- Nwabufo, B. N., Umoru, T. A., & Olukotun, J. O. (2013, June). The challenges of e-learning in tertiary institutions in Nigeria. In *International Conference the Future of Education Florence, June*.
- Okiki, O. C., & Asiru, S. A. (2011). Use of electronic information sources by postgraduate students in Nigeria: Influencing factors.
- Olaoye, B. O., & Adeyemi, M. A. (2013). Impact of reward on employees' performance in a selected manufacturing companies in Ibadan, Oyo State, Nigeria. *International Journal of Arts and Commerce*, 2(2), 27-32.
- Olema, V. (2019). *Improving e-learning through usage of learning management system: a case of a masters in vocational pedagogy at Kyambogo University* (Doctoral dissertation, Kyambogo University (unpublished work)).
- Ouma, G. (2013). Level of E-learning Implementation Readiness in Public Secondary Schools: A Study of Rachuonyo North and Rachuonyo South Districts, Kenya (Doctoral dissertation, Kisii University).
- Ouma, G. O., Awuor, F. M., & Kyambo, B. (2013). E-learning Readiness in Public Secondary Schools in Kenya. *European Journal of Open, Distance and E-learning*, 16(2), 97-110.
- Ouma, G. O., Awuor, F. M., & Kyambo, B. (2013). E-learning Readiness in Public Secondary Schools in Kenya. *European Journal of Open, Distance and E-learning*, 16(2), 97-110.
- Pardamean, B., & Suparyanto, T. (2014). A Systematic Approach to Improving E-learning Implementations in High Schools. *Turkish Online Journal of Educational Technology-TOJET*, 13(3), 19-26.
- Petko, D., Egger, N., Cantieni, A., & Wespi, B. (2015). Digital media adoption in schools: Bottom-up, top-down, complementary or optional?. *Computers & Education*, 84, 49-61.
- Piper, B., Jepkemei, E., Kwayumba, D., & Kibukho, K. (2015). Kenya's ICT Policy in Practice: *Forum for International Research in Education* (Vol. 2, No. 1, pp. 3-18).
- Qamar, K., Kiran, F., Khan, M. A., Raza, S. N., Iram, M., & Rauf, A. (2021). Challenges of e-learning faced by medical teachers and students during COVID-19 pandemic. *Pakistan Armed Forces Medical Journal*, 71(Suppl-1), S3-9.

- Qureshi, I. A., Ilyas, K., Yasmin, R., & Whitty, M. (2012). Challenges of implementing e-learning in a Pakistani university. *Knowledge Management & E-learning: An International Journal*, 4(3), 310-324
- Rastogi, A., & Malhotra, S. (2013). ICT skills and attitude as determinants of ICT pedagogy integration. *European Academic Research*, 1(3), 301-318.
- Shelestova, T. Y., Zhetpisbayeva, B. A., & Kazimova, D. A. (2017). The effect of illustrations and simulations in English course books in a Kazakhstani context on primary school students' English language achievement. *International Electronic Journal of Elementary Education*, 10(1), 163-174.
- Siedlecki, S. L. (2020). Understanding descriptive research designs and methods. *Clinical Nurse Specialist*, 34(1), 8-12.
- Singh, G. (2016). Challenges for Teachers in the Era of E-learning in India. *Scholedge International Journal of Multidisciplinary & Allied Studies*, 3(2).
- Smith, J. J., & Greene, H. C. (2013). Pre-service teachers use e-learning technologies to enhance their learning. *Journal of Information Technology Education: Research*, 12(1), 121-140.
- Tarus, J. K., Gichoya, D., & Muumbo, A. (2015). Challenges of implementing e-learning in Kenya: A case of Kenyan public universities. *The International Review of Research in Open and Distributed Learning*, 16(1).
- Tarus, J. K., Gichoya, D., & Muumbo, A. (2015). Challenges of implementing e-learning in Kenya: A case of Kenyan public universities. *The International Review of Research in Open and Distributed Learning*, 16(1).
- Tedla, B. A. (2012). Understanding the importance, impacts and barriers of ICT on teaching and learning in East African countries. *International Journal for e-learning Security (IJeLS)*, 2(3/4), 199-207.
- Tondeur, J., Krug, D., Bill, M., Smulders, M., & Zhu, C. (2015). Integrating ICT in Kenyan secondary schools: an exploratory case study of a professional development programme. *Technology, Pedagogy and Education*, 24(5), 565-584.
- Tumwesige, J. (2020). COVID-19 Educational disruption and response: Rethinking e-Learning in Uganda. *University of Cambridge*.

- Tunmibi, S., Aregbesola, A., Adejobi, P., & Ibrahim, O. (2015). Impact of E-learning and Digitalization in Primary and Secondary Schools. *Journal of education and practice*, 6(17), 53-58.
- Volman, M., Oort, F., & Beishuizen, J. (2015). The effects of scaffolding in the classroom: *Instructional Science*, 43, 615-641.
- Wabeke, E. C. (2021). *Adoption and Implementation of E-Learning in Nigerian Public and Private Higher Education Institutions: A Multicase Study* (Doctoral dissertation, Keiser University).
- Waita, K. J., Mulei, K. O., Mueni, K. B., Mutune, M. J., & Kalai, J. (2016). Pupil-teacher ratio and its impact on academic performance in public primary schools in Central Division, Machakos County, Kenya. *European Journal of Education Studies*.
- Wamae, J. M. (2011). *Challenges of implementing e-learning systems in higher Education Institutions in Kenya* (Doctoral dissertation, University of NAIROBI).
- Wambugu, G. M., Ogenga, S., Shikali, C., & Muliaro, J. (2017). Computer laptop project strategy for basic education schools in Kenya.
- Wei, L. M. (2017). *Principal technology leadership practices, teacher ICT competency, and teacher acceptance of School Management System (SMS) in Negeri Sembilan secondary schools* (Doctoral dissertation, University of Malaya (Malaysia)).
- Wichadee, S. (2015). Factors Related to Faculty Members' Attitude and Adoption of a Learning Management System. *Turkish Online Journal of Educational Technology-TOJET*, 14(4), 53-61.
- Yoon Kim, Chiu, Y. Jo., Hanaki, K., Hegde, D., & Petrov, S. (2014). Temporal analysis of language through neural language models. *arXiv preprint arXiv:1405.3515*.
- Zaini, A. (2018). Word processors as monarchs: Computer-generated feedback can exercise power over and influence EAL learners' identity representations. *Computers & Education*, 120, 112-126

APPENDICES

Appendix 1: Questionnaire

1.1 Questionnaire for teacher/head of institution

This questionnaire will be administered to teacher/head of institution. It comprises of two parts. Part one will gather information on personal details while part two will collect information on LMS' Considerations and facilitation of e-learning in the schools. Your responses will be anonymous. Please do not write your name on the questionnaire.

Tick (√) in the box provided below. If you okay with to participating in the study.

Agree **Don't agree**

Please respond to each question by filling or ticking (√) your honest response in the box.

PART I: Demographic Data.

Name of School:

.....

School Category: Extra- county [] County [] Sub-County [] Private []

Gender: Male [] Female []

Designation: Head of institution [] Teacher []

Age bracket: 21-30 years [] 31-40 years [] 41-50 years [] 51-60 years []

Highest level of education level: Diploma [] Degree [] Masters []

How long have you worked in the school?

0-5 years [] 6-10 years [] 11-15 years [] 16 years and above []

PART II: E-learning Facilitation and LMS Considerations

1. (a) The following statement seeks to establish basic information on ICTs in the school. Kindly rate the items and facilities listed below in your school using the given scale.

(1) Unavailable (2) Very Inadequate (3) Inadequate (4) Adequate (5) Very Adequate

		1	2	3	4	5
A	Power (KPLC, generator, solar panels)					
B	Computer rooms/laboratories for e-learning facilitation					
C	Computers (desktops, pads, laptops)					
D	Furniture (desks, chairs, tables) for e-learning facilitation					
E	Reliable internet data					
F	Learning Management Systems (educational software)					

1(b). The following statement seeks to establish more information about ICTs in the school. Kindly tick () either YES or NO.

		YES	NO
A	Are all computers in the school connected to the internet?		
B	Is the internet reliable and fast enough?		
C	Do students get access to the computers?		
D	Do teachers access the internet?		
E	Are there plans to use computers for e-learning?		
F	Are there any Learning Management Systems like Educational software?		

2. The following statement seeks to establish perception and views towards E-learning in the school. Kindly rate the statements listed below using the given scale.

(1) = Strongly Disagree (2) =Disagree (3) =Somewhat Agree (4) =Agree (5) =Strongly Agree

		1	2	3	4	5
A	E-learning can improve the level of education in the school					
B	E-learning will make learning more interesting					
	There is lack of opportunity to train and learn technology					
C	Psychologically students are set to start e-learning					
D	Mentally, educators are ready to use ICT in e-learning					
E	Computers are hard and frustrating to use					
F	Our school has plans to install ICT infrastructure					
G	I would wish if my school to send me for a e-learning course					
H	I do waste a lot of time try to work with computers					
I	The ICT technical support is adequate to support e-learning					
J	Students have sufficient computer skills to enable e-learning					
K	There is sufficient computer literacy level among the teachers					
L	It is important to learn about e-learning in this age and time					
M	Teachers have interest towards using LMS and ICT					

3(a). The following statement seeks to establish information on teacher's ICT skills and e-learning. Please rate the statements listed below using the given scale.

(1)=Not at All (2) =Not Very Well (3) = Neutral (4) =Well (5) =Very Well

		1	2	3	4	5
A	I'm able to create a new document using Microsoft Wo					
B	I am able to create a table using Microsoft Excel					

C	I am able print a document					
D	I am able to direct open a web address					
E	I can send and receive e-mails					
F	I am able to send an e-mail with an attached file.					
G	I am able to access my online payslip and file tax return					
H	I have the basic computer skills to enable me use use search engines to type and search information					
I	I can use browsers such as chrome and Mozilla To search the World Wide Web.					

3(b). The following statements seeks to establish extent of E-Learning facilitation in the school. Kindly rate the statements listed below using the given scale.

(1)=Never (2) = Rarely (3) = Sometimes (4) = Often (5) = Always

		1	2	3	4	5
A	I do communicate using email address					
B	I do give students homework via email					
C	I use word application to make lesson plan, Schemes of work, notes, and type exams.					
D	I use excel worksheets to make a time table, attendance records, exam marks and analysis.					
E	I use a database applications to keep personal And student's records.					
F	I produce notes, teaching aids hand-outs using a Desktop publisher.					
G	I use PowerPoint for presentation During lessons.					
H	I use scanners, printers and photocopiers to Produce materials of teaching and learning.					
I	I use computer to create tables, upload images, and draw diagrams					
J	I use internet to source teaching and learning materials					

K	I exchange teaching and learning materials with my Colleagues using the Email.					
L	I use materials from flash discs, memory chips, in my lessons.					

Thank you for your response

END

Appendix 2: List of school

County schools		
	Name of school	Number of teachers
1	Magereza Secondary Schools	18
Extra county schools		
1	Naivasha High School	29
2	Naivasha Girls	40
3	Enaiposha Girls	14
4	Maai Mahiu Girls	15
5	Maaii Mahiu Boys	39
Sub-County Schools		
1	Kiambogo Secondary	15
2	Nyonjoro Mixed School	13
3	Mwicingiri Mixed Day	12
4	Naivasha Day Secondary School	35
5	Maraigushu Secondary School	11
6	Mununga Secondary School	13
7	Gituru Mixed Day School	15
8	Kinungi Secondary School	14
9	Nyondia Mixed Day School	22
10	Munyu Mixed Day School	12
11	Gituamba Secondary School	14
12	Gatamaiyu Secondary School	11
13	Milimani High School	47
14	Nyakairu Secondary School	9
15	North Karati Mixed Day School	10
16	Nyamathi Secondary School	14
17	Rutere Mixed Day School	9
18	Mirera High School	46
19	Maiella Central Secondary	8
20	Maiella Township Mixed School	13
21	Ndabibi Mixed School	16
22	St Andrews Tarabete School	12
23	Moi Ndabi Mixed Secondary School	11
24	Rubiri Mixed School	10
25	Ngodi Mixed School	11
26	Kipkonyo Mixed Secondary School	7
27	Karima Mixed School	23
28	Longonot Township Secondary School	17
29	Kijabe Township Mixed School	10
30	Namuncha Peace Mixed School	8
31	Governor Mixed Day School	12
32	Ndoroto Secondary School	6
33	Karai Secondary School	8
34	Ndabibi Main Secondary School	6
Private Schools		

1	Bishop Wambari Girls	9
2	Naivasha Boys School	6
3	Archbishop Ndingi Secondary School	6
4	St. Francis Xavier Girls	10
5	Hot springs Girls	9
6	Vineyard Girls	8
7	Lake Naivasha High School	9
8	Silver Hill Mixed School	5
9	Naivasha Mixed School	6
10	One 27 KAG Mixed School	7
11	Lake Academy Mixed School	5
12	Lakeview Secondary Mixed School	6
13	Precious view Mixed School	5
14	Sher Academy Mixed School	7
15	Rev. Githirwa Mixed School	8
16	Oserian Mixed Secondary	7
17	Blessed Mustard Mixed School	8
18	Jeremiah Gitau Mixed School	7
19	P.C.E.A Longonot Mixed School	6
20	St Claire of Assis Girls	10
21	Semita Girls	7
TOTAL		
61		806

Thank you for your response

END

Appendix 3: Kenyatta University research authorization



KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke

Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57530

Our Ref: D53/CE/24161/2012

DATE: 8th December, 2022

Director General,
National Commission for Science, Technology
and Innovation
P.O. Box 30623-00100
NAIROBI

Dear Sir/Madam,


RE: RESEARCH AUTHORIZATION FOR NJOROGE PAUL MWaura - REG. NO. D53/CE/24161/2012

I write to introduce Njoroge Paul Mwaura who is a Postgraduate Student of this University. She is registered for M.BA degree programme in the Department of Management Science.

Njoroge intends to conduct research for a M.BA Project Proposal entitled, "Learning Management Systems' Considerations and Facilitation of E-Learning in Secondary Schools in Naivasha Sub-County, Kenya."

Any assistance given will be highly appreciated.






Yours faithfully,


PROF. ELISHIBA KIMANI
EXECUTIVE DEAN, GRADUATE SCHOOL

AM/mo



Appendix 4: NACOSTI research permit

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 463861	Date of Issue: 16/January/2023
RESEARCH LICENSE	
	
This is to Certify that Mr.. Paul Mwaura Njoroge of Kenyatta University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nakuru on the topic: Learning Management Systems Considerations and facilitation of E-learning in secondary schools in Naivasha Sub County Kenya for the period ending : 16/January/2024.	
License No: NACOSTI/P/23/23154	
463861 Applicant Identification Number	 Director General NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
	Verification QR Code 
NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.	
See over leaf for conditions	