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School Resources and Effective Implementation of E-Learning in Secondary Schools in Kasese Municipality, Uganda

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Abstract: This study examined the influence of school resources on the effective implementation of e-learning in secondary schools in Kasese Municipality, Uganda. Specifically, the study investigated the impact of tangible resources, intangible resources, and school capabilities on e-learning in these schools. Using quantitative research approach, the study employed a correlational research design and collected data from 170 teachers using a self-administered questionnaire. The data were then analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The results of the SEM analysis revealed that school resources, namely tangible resources ($\beta = 0.266$, $t = 3.612$, $p = 0.000<0.05$), intangible resources ($\beta = 0.234$, $t = 2.351$, $p = 0.019<0.05$) and capabilities ($\beta = 0.456$, $t = 5.129$, $p = 0.000<0.05$), had a significant positive influence on e-learning. Based on these findings, the study concluded that tangible and intangible resources and school capabilities are necessary for the effective implementation of e-learning in secondary schools. The study recommends that the Ministry of Education, school directors, and head teachers ensure that schools have sufficient tangible resources for e-learning. Additionally, directors and head teachers should also ensure that schools possess adequate intangible resources and capabilities to support the effective implementation of e-learning. The practical significance of this study lies in its demonstration of how existing resources in schools can be utilised to implement e-learning in secondary schools effectively.

Keywords: Tangible resources, intangible resources, capabilities, e-learning, secondary schools.

1. Introduction

The COVID-19 pandemic resulted in the closure of schools, forcing them to confront the reality of e-learning, which they were unprepared for. While some institutions previously used e-learning as a distinctive teaching style, it has become widespread in every educational institution (Mugizi et al., 2023). There is now a global consensus that e-learning is an essential method of instruction for educational institutions worldwide (Dignen & Burmeister, 2020). Educational institutions around the globe have embraced e-learning as a prevalent means of delivering education (Lee et al., 2019). Specifically, e-learning has played a crucial role in facilitating student-centred learning since the COVID-19 lockdowns (Almaiah et al., 2020). However, during the lockdown, approximately 297 million students across Africa faced challenges accessing e-learning (Kuwonu, 2020). These challenges included limited electricity supply, lack of internet connectivity in some areas, unaffordable internet data, the urban-rural digital divide, and a lack of necessary facilities and devices for e-learning (Radoine et al., 2022). Most African countries also lacked adequate policies to ensure better educational outcomes, with the exception of South Africa, which had a clearly defined e-education policy. However, even in South Africa, there are gaps in policy comprehension among

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those involved in delivering instruction, which has affected the implementation of e-learning (Kibuku et al., 2020; Skhephe, 2022).

In Uganda, the e-learning challenges include inadequate e-infrastructure, teachers' limited e-competence, and limited access to technology (Sanyu, 2023). Additionally, there is a lack of policy for secondary schools regarding content creation, access, and interactive platforms, leaving teachers without guidance on how to implement e-learning (Walekhwa et al., 2022). Further, low internet penetration in Uganda means that only a few individuals can access e-learning. Furthermore, there are barriers related to technology infrastructure, such as high access costs, unreliable and subpar internet connections, intermittent electricity, lack of access to appropriate software and platforms for delivering courses, limited skilled human resources to manage the resources, a user base with low levels of technological literacy, and limited availability of online scholarly resources (Tumwesige, 2020).

Nonetheless, it is important to note that most schools in Uganda have some existing e-learning infrastructure. For example, virtually all government schools have computer laboratories, and virtual science content has been installed in each school's computer laboratories with trained ICT teachers (Lukenge, 2019). Most government-aided secondary schools have at least twenty computers, with larger schools provided forty by the government. Schools without electricity have access to solar panels to help them utilise the computers (Lutalo et al., 2020). Additionally, a number of schools are connected to the internet to increase access to digital learning (Kazibwe, 2023). With evidence of existing e-resources in schools, this empirical analysis examined how these resources influenced e-learning using the Resource-Based View Theory (RBVT). The resources considered in relation to e-learning, based on RBVT, were tangible and intangible resources, as well as capabilities (Kamasak, 2017), leading to the following hypotheses that were tested:

- H1: Tangible resources have no significant influence on the implementation of e-learning in secondary schools.
- H2: Intangible resources have no significant influence on the implementation of e-learning in secondary schools.
- H3: School capabilities have no significant influence on the implementation of e-learning in secondary schools.

2. Theoretical Review

The Resource-Based View Theory (RBVT), which is attributed to Penrose (1959) and supported by advocates such as Barney (1986), serves as the foundation for this study. RBVT asserts that an organisation's productivity is driven by its existing essential resources (Penrose, 1959). However, the organisation only becomes successful if it can absorb and utilise these resources (Kraaijenbrink et al., 2010). These resources include tangible and intangible resources, as well as capabilities necessary for successful performance (Kamasak, 2017). Tangibles represent physical resources that provide a sustainable competitive advantage (Holdford, 2018), while intangibles represent the organisational factors, especially in knowledge-based organisations, that contribute to increased value (Oprean-Stan, Stan & Brătian, 2020). Capabilities encompass the latent capacities that drive operations due to accumulated know-how (Othmana et al., 2015). In the context of e-learning, tangible resources include ICT facilities such as computers, the internet, and broadcasting technologies, as well as ICT policies that incorporate ICT as a teaching and learning tool (Mugizi & Rwothumio, 2023a). Intangible resources encompass technical know-how, learning culture, and relationships with stakeholders (Sharma & Dharni, 2020). Conversely, capabilities involve trialability (experimentation), integration, and knowledge management (Mugizi & Rwothumio, 2023b). The combination of these resources and capabilities forms the foundation for organisations when pursuing their programs and projects. Therefore, these resources and capabilities are the source of

value for organisations involved in delivering certain services, providing them with a competitive advantage (Amit & Han, 2017). RBVT suggests that organisations, such as schools, possess resources that should be leveraged to enhance performance. This study examines how the tangible resources, intangible resources and capabilities of schools influence the effective implementation of e-learning.

2.1 Tangible resources and effective implementation of e-Learning

Tangible resources refer to the material or physical assets of the organisation (Orth et al., 2015). Organisations utilise tangible resources to deliver services (Jawed & Siddiqui, 2019). Examples of tangible resources include ICT teaching facilities, e-library resources, and implementation policies that facilitate instructional and learning processes. Specifically, ICT teaching facilities encompass assets such as computers, the internet, and video streaming technologies (Mugizi & Rwothumio, 2023a). Scholars (Alamsyah et al., 2022; Almaiah & Al-Khasawneh, 2020; Eli-Chukwu et al., 2023; Ismail et al., 2020; Masood et al., 2019; Mugizi & Rwothumio, 2023a; Rahman et al., 2022; Rajchelt-Zublewicz et al., 2019; Saleh et al., 2022) have examined the relationship between tangible resources and e-learning. However, some of these studies have identified gaps in the evidence. For instance, unlike other studies, Masood et al. (2019) found that tangibility was not a significant predictor. Mugizi and Rwothumio (2023b) discovered that while ICT policies were significant predictors of e-learning implementation, the facilities and library e-resources were not. This suggests that not all tangible resources have a significant impact on e-learning. Additionally, Rajchelt-Zublewicz et al. (2019) reported a weak correlation between tangible resources and organisational performance. These evidence gaps indicate a lack of consensus on the relationship between these variables. Therefore, the results of different studies should be considered independently.

2.2 Schools' intangible resources and e-learning implementation

Intangible resources are the non-physical assets of organisations (Simarmata et al., 2022). These resources are invaluable and provide organisations with a competitive advantage, leading to long-lasting and sustainable success (Bulińska-Stangrecka & Bagieńska, 2020). Examples of such resources include technology know-how, a learning culture, and relationships with stakeholders (Sharma & Dharni, 2020). Intangible assets play a significant role in enhancing organisational performance, particularly when utilising digital technologies (Ferdaous & Rahman, 2019). For instance, technology know-how increases engagement and facilitates successful implementation (Cegarra-Navarro et al., 2014). Similarly, a learning culture, characterised by creativity and flexibility, fosters innovativeness (Porcu, 2020). Additionally, strong relationships with stakeholders, including partners, regulators, and those affected by the implementation, are crucial for effective implementation (Plaza-Úbeda et al., 2010). Several scholars (e.g., Adiyarta et al., 2018; Ati et al., 2021; Basantes-Andrade et al., 2020; Hatlevik & Hatlevik, 2018; Kamasak, 2017; Kong, 2019; Sorochinsky, 2021; Twinamasiko et al., 2021; Trivedi & Patel, 2020; Ünal, 2020) have explored the relationship between intangible resources and e-learning. However, these studies have primarily focused on contexts outside of Uganda, leaving the opinions of those involved in e-learning implementation in the local context unexplored. This population gap necessitates the present study, which focuses on teachers in secondary schools in Uganda.

2.3 School capabilities and e-learning implementation

Capabilities refer to the underlying factors of organisations, such as competencies and expertise, that drive operations (Lee et al., 2020). These capabilities are essential for enabling organisations to innovate and integrate new acquisitions, such as e-learning (Costello & McNaughton, 2018). In the context of e-learning implementation, school capabilities primarily include experimentation, content management, capability integration, and organisational culture (Costello & McNaughton, 2018). Scholars (Martha et al., 2021; Mtebe & Raphael, 2018; Mugizi & Rwothumio, 2023b; Ndongfack, 2021; Park et al., 2018; Pinho et al., 2021; Romadhon et al., 2022; Teo et al., 2020; Yaniawati et al., 2020) have

also examined the relationship between intangible resources and e-learning. However, there are gaps in the evidence, as some studies have reported conflicting findings. For example, Mugizi and Rwothumio (2023b) and Park et al. (2018) found that aspects of capabilities, such as experimentation, had an insignificant and negative relationship with e-learning, while Mtebe and Raphael (2018) found that the content management aspect of content quality was insignificant. These gaps in evidence suggest that there is no definitive agreement on the relationship between variables. Therefore, it is necessary to consider findings within each context separately, highlighting the need for this study.

3. Research Methods

The correlation research design was used to implement the study. This was because the study sought to determine whether school resources were related to the effective implementation of e-learning. The researchers adopted the quantitative approach since the study had to carry out inferential analysis to establish relationships. The study sample consisted of 183 teachers from a population of 236 teachers drawn from eight secondary schools. However, the response rate is 170, which forms the totla used sample. The sample was generated using simple random sampling, ensuring that the study's findings are generalisable. A self-administered questionnaire was used to collect the data.

3.1 Measurement of the variables

The study variables included school resources and e-learning implementation. The measures of e-learning, such as student-student e-interaction, student-teacher e-interaction, and student-content e-interaction, were obtained from Downer et al. (2015), Malinovski et al. (2012), and Yılmaz and Karataş (2018). The measures of school resources consisted of tangible and intangible resources and capabilities. Tangible resource measures included teaching facilities, ICT policy, and e-library resources (Akbulut et al., 2007; Anyim, 2018). The measures of intangible resources included technical know-how, learning culture, and relationship with stakeholders (Bhat & Bashir, 2018; Leufvén et al., 2015). The measures of capabilities were experimentation, content management, and integration capability (Moore & Benbasat, 1991; Wang & Zeng, 2017; Jamieson-Proctor et al., 2007). The indicators for each construct were assessed using a five-point Likert scale, providing data suitable for quantitative analysis.

3.2 Data analysis

Measurement, structural and path models were used to analyse data. The measurement models were the basis for determining whether the various indicators were accurate and inter-related. The structural and path models established causal linkages between the variables. The measurement and structural models were constructed using SmartPLS 4 software, which helps carry out partial least squares structural equation modelling (PLS-SEM). PLS-SEM identified predictive links between school resources and the effective implementation of e-learning.

4. Findings

The findings produced included demographic characteristics of teachers, measurement models, and structural equation models. The results were the basis for making descriptive and inferential analyses.

4.1 Demographic characteristics

The demographic characteristics analysed were the age and education status of the teachers who participated in the study. The analysis identified categories of the study participants describing those who participated in the study.

Table 1: *Respondents' demographic characteristics*

Item	Categories	Frequency	Percentage
Sex of respondents	Male	122	71.8
	Female	48	28.2
	Total	170	100.0
Age group	Up to 30 years	56	33.9
	Below 40 years	56	32.9
	40 years and above	58	34.1
	Total	170	100.0
Highest level of education	Diploma	20	11.8
	Bachelors	113	77.0
	Post Graduate Diploma	8	4.7
	Master's Degree	11	6.5
	Total	170	100.0
Responsibilities of the participants	Teacher only	70	41.2
	Class teacher	35	20.6
	Head of department	59	34.7
	Club patron	6	3.5
	Total	170	100.0

The table reveals that the larger percentage (71.8%) of the respondents was males, while females accounted for 28.2%. Therefore, the findings imply that a higher proportion of male teachers participated in this study.

The results on age groups showed that 34.1% of the study participants were 40 years and above, 32.9% were below 40 years, and 32.9% were up to 30 years. In terms of the highest level of education attained, 77.0% of the participants had bachelor's degrees, 11.8% had diplomas, 6.5% had master's degrees, and 4.7% had postgraduate diplomas. Regarding the positions of the teachers, 41.2% of the respondents were teachers only, 34.7% were heads of departments, 20.6% were class teachers, and 3.5% were club patrons. Overall, the demographic characteristics of the respondents indicated that different categories of teachers participated in the study. This suggests that the results are representative of different groups of teachers and can be generalised.

4.2 Measurement models

Heterotrait-Monotrait ratio correlations (HTMT) for discriminant validity were measured to establish whether the data obtained was fit for structural modelling. Internal consistency of the indicators of the measures was also tested using Chronbach's alpha and composite reliability, and variance inflation factor (VIF) was also tested to assess collinearity or the existence of correlation among variables. The results are presented in Tables 2 and 3.

Table 2: *Heterotrait-Monotrait Ratio of Correlations (HTMT) for discriminant validity*

EI Measures	EI	ESC	ESS	EST
EI				
ESC	0.871			
ESS	0.827	0.503		
EST	0.871	0.615	0.693	
TR measures	TR	LE	SIP	ITF
TR				
LE	0.591			
SIP	0.665	0.666		
ITF	0.882	0.899	0.900	
IR measures	IR	LC	RS	TK

IR				
LC	0.877			
RS	0.894	0.672		
TK	0.760	0.462	0.505	
CAP measures	CAP	EX	IC	KM
CAP				
EX	0.890			
IC	0.876	0.756		
KM	0.881	0.680	0.735	

Key: CAP = Capabilities, ESS = E-learning student-student, EI= E-learning Implementation, EST = E-learning student- Teacher, E-student, ESC- E-student content e-interaction, EX= experimentation, IC = Integration Capability, ITF= ICT teaching facilities, IR = Intangible resources, KM = Knowledge Management, LC = Learning culture, LE= Library E-Resources, RS = relationship with stakeholders, SIP =School ICT Policies, TK = Technical know-how, TR= Tangible resources.

Table 2 reveals that the Heterotrait-Monotrait ratio of correlations (HTMT) for discriminant validity indicates that the independence of measures of the variables satisfied the condition. All the values were below 0.90, which is the upper limit (Franke & Sarstedt, 2019). This suggested the predictor variables independently determined the effective e-learning implementation.

Table 3: *Chronbach's Alpha, Construct Reliability, AVE and VIF*

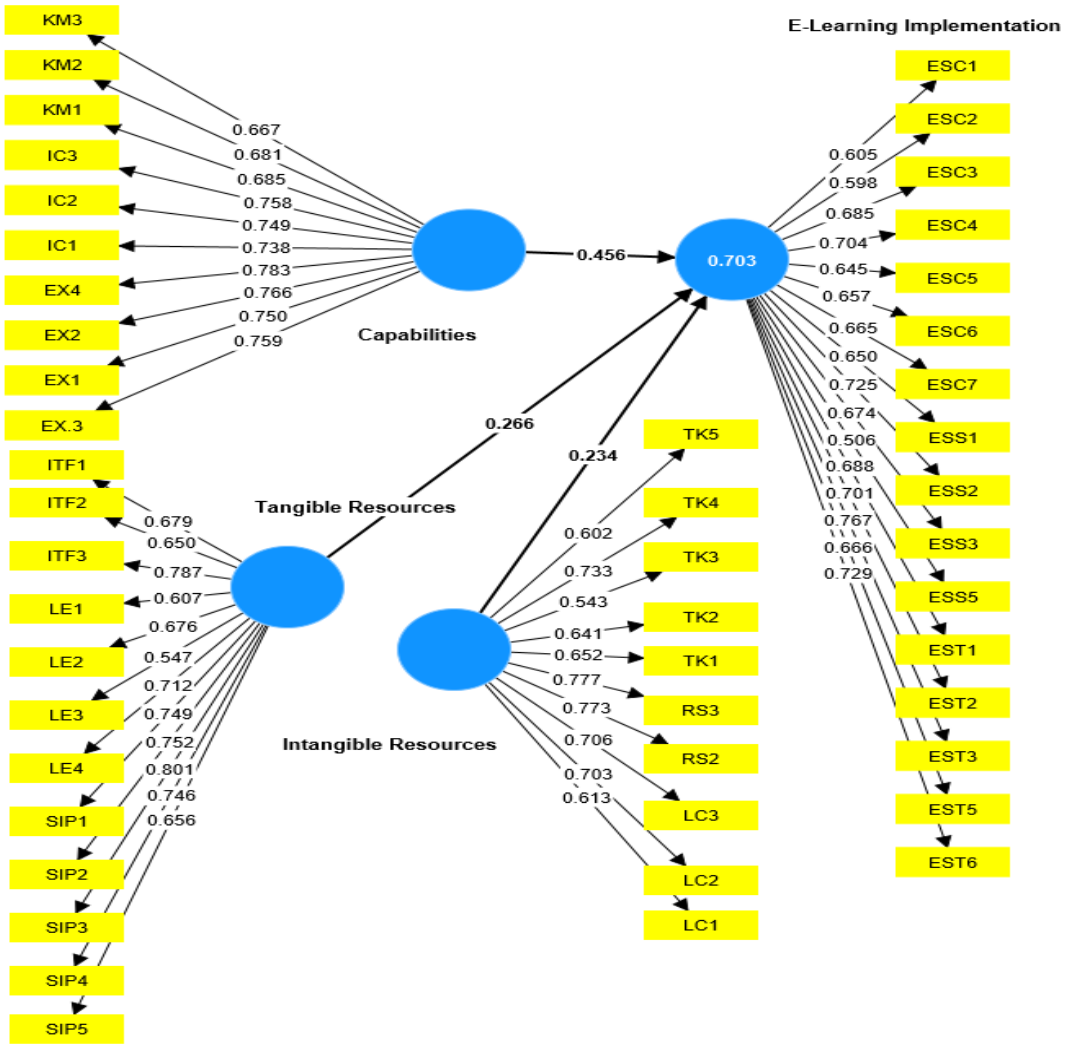
Measures	α	CR	AVE	VIF
E-student-content e-interaction	0.887	0.912	0.597	1.595
E-student-student e-interaction	0.837	0.885	0.608	1.800
E-student-teacher e-interaction	0.860	0.905	0.706	1.463
ICT Teaching Facilities	0.870	0.920	0.793	1.650
Library E-resources	0.815	0.878	0.645	1.579
School ICT Policies	0.876	0.911	0.673	1.783
Learning Culture	0.815	0.878	0.645	1.579
School ICT Policies	0.876	0.911	0.673	1.783
Learning Culture	0.847	0.908	0.766	1.570
Relationship with Stakeholders	0.871	0.939	0.886	1.640
Technical know-how	0.847	0.891	0.620	1.297
Experimentation	0.876	0.915	0.729	1.882
Integration Capability	0.834	0.900	0.750	1.981
Knowledge Management	0.793	0.879	0.708	1.711

Internal consistency test results in (Table 3) involving Cronbach's Alpha, Composite Reliability for and average variance extracted (construct validity) show that the indicators and constructs were interrelated. The values for Cronbach's Alpha and composite reliability were all above 0.7, indicating that the indicators were internally consistent and suggesting a satisfactory level of reliability for the measures. This satisfied the minimum requirement of 0.70 when using Cronbach's Alpha and Composite Reliability (Lai, 2021). Convergent validity (AVE) test results showed that the values were above 0.5 for the different constructs. This meant all the constructs had convergence on the variables they measured. With respect to VIF, all the values were below 5, which is the maximum level; hence, there was limited collinearity (Kalnins, 2018). The results above suggested that the indicators of the constructs as well as the constructs, were internally consistent.

4.3 School resources and effective implementation of e-learning

A structural equation model was developed to determine the influence of school resources on the effective implementation of e-learning. Figure 1 is a structural model describing the influence of school resources on the effective implementation of e-learning.

Figure 1: *School Resources and Effective Implementation of E-Learning*



The structure model (Figure 1) shows the influence of school resources and the effective implementation of e-learning. The model shows that school resources are tangible resources, intangible resources, and capabilities, while e-learning measures are student-teacher e-interaction, student-student e-interaction, and student-content e-interaction. The model shows that the three factors accounted for 70.3% (0.703) of e-learning implementation. The coefficients in the path model (Table 4) show the influence of each of the school factors on e-learning implementation.

Table 4: *Path Model for School Resources and Effective Implementation of E-Learning*

Path coefficients	B	Mean	STD	T	P
Tangible Resources -> E-Learning	0.266	0.270	0.074	3.612	0.000

Implementation					
Intangible Resources -> E-Learning Implementation	0.234	0.231	0.100	2.351	0.019
Capabilities -> E-Learning Implementation	0.456	0.460	0.089	5.129	0.000
R^2 = 0.703					

The results in Table 4 reveal that school resources contributed 70.3% ($R2$ = 0.703) of the joint variation in effective e-learning implementation. The coefficient of determination suggested that 29.7% of the variation in effective e-learning implementation was accounted for by other factors other than school resources. The model shows that tangible resources ($\beta = 0.266$, $t = 3.612$, $p = 0.000<0.05$), intangible resources ($\beta = 0.234$, $t = 2.351$, $p = 0.019<0.05$) and capabilities ($\beta = 0.456$, $t = 5.129$, $p = 0.000<0.05$), had a positive and significant influence on effective e-learning implementation. Therefore, hypotheses One to Three (H1-H3) were supported.

5. Discussion

The results revealed that tangible resources had a positive and significant influence on the effective implementation of e-learning. This finding is consistent with several scholars (Alamsyah et al., 2022; Almaiah & Al-Khasawneh, 2020; Eli-Chukwu et al., 2023; Ismail et al., 2020; Rahman et al., 2022; Rajchelt-Zublewicz et al., 2019; Saleh et al., 2022) who revealed that tangible resources had a significant relationship with e-learning. However, the finding was inconsistent with Masood et al. (2019), who reported that tangible resources had no impact and Rajchelt-Zublewicz et al. (2019), who reported the existence of a weak correlation. Nonetheless, the finding is consistent with most of previous scholars, it can be affirmed that school resources have a significant influence on effective e-learning implementation. Also, the results revealed that intangible resources had a positive and significant relationship with the effective implementation of e-learning. This finding is consistent with earlier scholars (Adiyarta et al., 2018; Ati et al., 2021; Basantes-Andrade et al., 2020; Hatlevik & Hatlevik 2018; Kamasak, 2017; Kong, 2019; Sorochinsky, 2021; Twinamasiko et al., 2021; Trivedi & Patel, 2020; Ünal, 2020; van Weele et al., 2020) who all revealed that intangible resources had a significant relationship with e-learning. Therefore, with the findings of the study consistent with previous scholars, it can be surmised that intangible resources are imperative for effective e-learning implementation.

Further, the findings revealed that schools' capabilities had a positive and significant influence on the effective implementation of e-learning. This concurred with previous scholars (Martha et al., 2021; Ndongfack, 2021; Park et al., 2018; Pinho et al., 2021; Romadhon et al., 2022; Teo et al., 2020; Yaniawati et al., 2020) who all indicated capabilities had a significant relationship with e-learning implementation. However, since the study did not test each aspect of capabilities independently, it did not confirm or disconfirm the findings by Mugizi and Rwothumio (2023b) and Park et al. (2018) that some aspects of capabilities, such as experimentation insignificantly and negatively related to e-learning and Mtebe and Raphael (2018) that the content management aspect of content quality was insignificant. However, with the study largely concurring with previous scholars, it can be affirmed that schools' capabilities have a positive and significant influence on the effective implementation of e-learning.

6. Conclusions

The study concluded that tangible resources are a requirement for the effective implementation of e-learning. This is so if the schools have ICT facilities, a school ICT policy and e-library resources. With ICT facilities, the internet speed should be good, the internet is sufficient, and there are opportunities to improve ICT knowledge. With respect to ICT policy, teachers need to know the administration

technological endeavours have guidelines for the use of ICT and uploading content. Concerning libraries' e-resources, this is when the schools have online databases, have access to diverse electronic resources, the online resources are easily accessible, and the libraries have internet services. The study also concluded that intangible resources are vital for the effective implementation of e-learning. This is so if teachers use ICT-based methodologies in developing teaching approaches, use ICT-enabled teaching methods instead of traditional methods, involve learners in online surfing of learning materials and share assignments, notes and study material through ICT. With respect to learning culture, this is when teachers help each other in the use of ICT; head teachers ensure that ICT experts are given time to support learning and ensure lessons learnt about e-teaching are available to all teachers. Concerning the relationship with the stakeholders, the management of the school should ensure teachers' and students' e-teaching demands are addressed, and management should frequently involve instructors and learners in learning matters.

Further, the study concluded that school capabilities are imperative for the effective implementation of e-learning in secondary schools. This is so if teachers are availed with opportunities to try various ICT teaching applications, have access to relevant applications and possess the ability to use ICT in teaching and learning. In addition, when students are equipped with knowledge, skills, abilities and attitudes toward technological change, teachers can use different ICT applications for effective teaching and engage in curriculum activities. With respect to teaching content management, this is when teachers can capture, categorise, store, and retrieve teaching content, maintain and upgrade teaching content, retrieve teaching content in ICT, and use saved information in the school system.

7. Recommendations

The study recommended that the Ministry of Education, directors of schools, and head teachers should ensure that schools have sufficient tangible resources for e-learning. Thus, they should ensure that the schools have sufficient ICT facilities, school ICT policies and e-library resources. In addition, directors and head teachers should ensure schools have adequate intangible resources. Such tangible resources require technology know-how, a learning culture and relationships with stakeholders. Lastly, directors and head teachers should ensure schools have adequate capabilities. Such capabilities include terms of experimentation, integration capability and teaching content management.

8. Declarations

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Appendix A: *Study Instrument*

Section A: Demographics	
BC1	Sex (1 = Male, 2= Female)
BC2	Age group (1= Up to 30; 2 = 30 but below 40; 3 = 40 and above).

Demographic Characteristics (BC)	BC3	Education level (1= a) Diploma; 2= Bachelors; 3 = Post graduate diploma; 4 = Master's degree
	BC4	Position in your current school (1 = Teacher only , 2= Class teacher 3 = Head of department; 4= Club patron)
Section B: Effective Implementation of E-learning		
Student-Student E-Interaction	ESS1	Students are able to learn from reading other students' comments posted online platforms
	ESS2	Comments and questions from other students help students to learn easily
	ESS3	Students have developed effective electronic communication skills through online interaction
	ESS4	Interacting with online increases students learning motivation
	ESS5	Should enjoy working in collaborative in online activities
Student-Teacher E-Interaction	EST1	Students ask questions during online lessons
	EST2	I am able to make students share ideas during online classes
	EST3	I am able to use all kinds of interesting materials in online classes
	EST4	Involve students in the learning process during online lessons
	EST5	I am able to explain content to students sufficiently when teaching online
	EST6	I allow students to speak up to share ideas during online classes
Student-Content E-Interaction	ESC1	Students can easily and simply use online learning
	ESC2	Students can access and simply search the system's resources
	ESC3	Students can quickly locate course information within the system
	ESC4	Students can easily and simply use online learning
	ESC5	E-learning provides students the opportunity of practicing what they learn in the lesson
	ESC6	E-learning materials stimulate students' interest in learning
	ESC7	The online materials in the subject I teach support student learning
Section C: Tangible Resources		
ICTs Teaching Facilities	ITF1	Internet speed at the school is good
	ITF2	The school provides sufficient internet
	ITF3	This school provides me sufficient opportunities to improve my technology knowledge
	ITF4	Computer rooms or laboratories lighting, air condition and arrangement are suitable for instruction in this school
	ITF5	The computers of the school have sufficient licensed software programs such as zoom, google classroom or any other
	ITF6	Learning materials can be easily downloaded for personal use
School ICT Policy	UIP.1	Teachers are informed about the administration's prospective technological endeavours
	UIP.2	The school has established guidelines for use of ICT in teaching and learning
	UIP.3	The school has a policy in place focused on ICT implementation in teaching and learning system
	UIP.4	The school ICT policy provides possibilities for use of ICT in teaching and learning

	UIP5	The school has guidelines for curriculum content uploading or delivery
Libraries E-resources	LE1	The school has online databases
	LE2	Can access diverse electronic resources using the school portal
	LE3	The school library e-resources interface makes it easy to access e-journals
	LE4	The library has facilities for using internet services
	LE5	The school online sources have sufficient resources
Section D: Intangible Resources		
Technology know-how	TK1	ICT based methodologies are very supportive in developing teaching approaches
	TK2	ICT resources for teaching and learning increase my productivity and effectiveness
	TK3	ICT enabled teaching is better than traditional methods of teaching
	TK4	Online surfing of learning material makes my students more effective day by day
	TK5	It is convenient to share assignments, notes and study material through ICT
Learning culture	LC.1	In this school, teachers help each other in use of ICT
	LC.2	In this school, expert staff in ICT have been given time to support learning
	LC.3	In this school lessons learned about e-teaching have been made available to all teachers
	LC.4	In this school, teachers have been given control over the resources they need to accomplish their activities
	LC.5	In this school, teachers have been mentored and coached in the use of ICT
Relationship with the stakeholders	RS.1	The school has partnerships that can help it in implementation of e-learning
	RS2	Management of the school has addressed e-teaching demands of teachers and students
	RS3	The school management frequently engages teachers and students with respect to e-teaching
	RS4	The school takes time to assess key requirements of teachers and students for e-teaching
	RS5	The school has prepared information for teachers and students on e-teaching and learning
Section E: Capabilities		
Experimentation	EX1	I have had a great opportunity to try various ICT teaching applications
	EX2	I have access to and try ICT teaching relevant applications
	EX3	I have had the opportunity to try out how I can make use of ICT in teaching and learning
	EX4	Being able to try out ICT in teaching was important in my decision to use it.
	EX5	I decided to adopt ICT in learning after I carried out a pilot test

Integration capability	IC1	My students are prepared to deal with on-going technological change given their knowledge, talents, skills, and attitudes
	IC2	I have used different ICT applications to teach effectively
	IC3	Using ICT applications, I have been able to engage in sustained involvement with curriculum activities
	IC.4	Using ICT I have supported elements of the learning process
	IC.5	I have undertaken formative and/or summative assessment using ICT
	IC6	With ICT learners have been able to engage in independent learning through access to education at a time, place and pace of their own choosing
Teaching Content Management	KM1	I use ICT technologies to capture and store teaching content
	KM2	ICT technologies facilitate the processes of capturing, categorising, storing, and retrieving teaching content
	KM3	I maintain and constantly upgrade content stored in the system
	KM4	When I need some teaching content, I know where to get it in the ICT system
	KM5	I access and use information and knowledge saved in the system of the school