Perception of Teachers on Effectiveness of Online Learning in the wake of COVID-19 Pandemic

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ABSTRACT: The rapid surge of digital technology coupled with Internet connectivity into the learning environment; provide remarkable opportunities for 21st century blended learning approaches. Whereas digital infusion into teaching is important, facilities need to be in place and teachers' must be ready with adequate skills. In line with this observation, this study sought to establish the perception of teachers on the effectiveness of online learning in the wake of the pandemic. The study explored the underlying factors that influence effective online learning. The study employed descriptive survey design; with target population of 150 teachers randomly sampled. The study used survey questionnaire as the main instrument to collect data. Data analysis relied on descriptive and inferential statistics, with data presented using tables. The study results found the teachers had positive perception to online teaching despite many challenges that hampered its effectiveness. Recommendations advocate for mainstreaming online learning into the education curriculum.
KEYWORDS: Online learning, ICT, Effectiveness

I. INTRODUCTION

Like globalization and urbanization, 'digitalization' has already changed the world. The rapid proliferation of Information and Communications Technology (ICT) is an unstoppable force, touching virtually every sphere of modern life, from economies to societies to cultures ... and shaping everyday life (UNICEF 2017). Information and Communications Technologies (ICTs) are already expanding access to high-quality educational content, including textbooks, video material and remote instruction, and at a much lower cost than in the past. According to researchers (Ayere, Odera and Agak, 2010) E-learning is the purposeful use of electronic systems or computer in support of the learning process. E-learning is an example of the use of these ICT-supported teaching and learning methods whose use in educational institutions is gaining momentum with the passage of time (Omwenga, June 2004). Other studies have shown that adoption and use of e-learning in schools can promote collaborative, active and lifelong learning, increase students' motivation, offer better access to information and shared working resources, deepen understanding, help students think and communicate creatively (Khan, Hasan & Clement, 2012).

ICT for education is more critical today than ever before since its growing power and capabilities are triggering a change in the learning environments available for education (Pajo & Wallace, 2001). Moreover, the use of (ICT) creates a powerful learning environment and it transforms the learning and teaching process in which students deal with knowledge in an active, self-directed and constructive way (Volman & Van Eck, 2001; de Corte et al.,2003). ICT is not just regarded as a tool, which can be added to or used as a replacement of existing teaching methods. ICT is seen as an important instrument to support new ways of teaching and learning. Plomp et al., 1996; Voogt,(2003), asserts that ICT should be used to develop student's skills for cooperation, communication, problem solving and lifelong learning. According to Zhao and Cziko (2001) three conditions are necessary for teachers to introduce ICT into their classrooms: teachers should believe in the effectiveness of technology, teachers should believe that the use of technology will not cause any disturbances, and finally teachers should believe that they have control over technology.

Kenya Ministry of Education Policy Framework for Education and Training (2012)identified ICT as a major vehicle for teaching and learning (MOE 2006). The e-learning framework seeks to facilitate sharing of e-learning resources between institutions and to exploit e-learning opportunities to offer Kenyan education programmes for export (ibid. 2006).Findings by Omwenga (2006) notes that even with the introduction of e-learning, a tool that provides an array of powerful tools that may help transform the present isolated, teacher-centred and text-bound classrooms into rich, student focused interactive knowledge environments, its effectiveness is still to be felt in Kenyan Secondary schools. Previous researchers Omwenga, Waema and Wagacha (2004) noted that the major challenge confronting Kenyan education system is how to transform the curriculum and teaching –learning process to provide students with the skills to function effectively.

1.1 Statement of the Problem

Online learning comprises a wide variety of programs that use the Internet within and beyond school walls to provide access to instructional materials as well as facilitate interaction among teachers and students. Singh and Thurman(2019), states thatstudents in online learning environment can be anywhere (independent) to learn and interact with instructors and other students. However, research findings by UNESCO (2015) indicate statistics reveal that ICT penetration rate in the education system in Kenya remains well below the 50% global threshold. In Kenya, like most developing countries, ICT usage is still limited to computerliteracy training (Mutuma, 2005). Furthermore, Karsenti (2011) contends that the present ICT curriculum merely deals with teaching about computers and not how computers can be used to transform the teaching and learning in our schools.

The review of literature has further revealed that E-learning initiatives have been introduced mostly in Public Universities in Kenya though on a limited scale, most of them being at the early stages. Furthermore, the research has observed that there issubstantial literature related to ICT usage in primary schools, many studies been dedicated towards ICT integration, but little empirical evidence is given in regards to online learning particularly in Primary schools.The Ministry, in the Education Policy Framework (EPF) recognizes that there are a number of Challenges concerning access and use of ICT in Kenya. Where there is electricity, hindrances to application of ICT include high costs of Internet provision, costs associated with digital equipment, inadequate infrastructure and support MOE(2006). In addition, many parts of Kenya cannot easily get Internet services because of the poor telephone networks. The question therefore remains: what level of preparedness are the schools in terms of transforming the curriculum and teaching –learning process, teacher competencies and access and availability of ICT infrastructure. These unanswered questions guide the findings of the study.

1.2 Purpose and Objectives

The purpose of this study was to establish the perception of teachers on the effectiveness of online learning in the wake of the pandemic. The objective was to examine theunderlying factors that influence effective online learning.

II. LITERATURE REVIEW

2.1 ICT Policy

In this chapter the researcher identifies the underlying factors that influence effective application of online learning. One of the factors identified is ICT policy. The argument is that availability of ICT policy influence effective online learning in a school. This argument is supported by OECD (2020) in the Framework where they mention that 'using digital devices and ICT effectively, to enhance teaching and learning, may also depend on schools' policies and practices'. Reinforcing the same is the finding by Awuor and Kaburu (2014) that ICT policy could be enhanced to ensure effective e-learning and there should be provision and support of e-learning in educational institutions through clear policy, strategy and implementation guidelines. McCarthy and Berger (2008) indicated that a school's ICT policy greatly affected students' ability to adapt to e-learning. Recent research by Tondeur et al. (2008) support that successful integration of ICT is much more likely when teachers share the values expressed within the school policy and understands their implications.

In other studies, the argument that is brought forward is that School ICT policies are crafted from the National ICT policy of a countryJones and Kozma (2003),state that national ICT policies can serve several important functions. Firstly, ICT policies provide a rationale, a set of goals, and a vision of how education systems work if ICT is introduced into teaching and learning, and they can benefit students, teachers, parents and the general population of a given country. Secondly, ICT policies are expected to provide guidance, and failure to do so means that individual school and classroom innovations would be unlikely to be sustained. Additionally, individual efforts are less likely to be felt across the country unless there is a shared vision clearly laid out in the policy (ibid).

2.2 Availability and access to ICT infrastructure

Access to adequate technology is clearly a prerequisite for successful adoption and use of ICT. Sound information and communication infrastructure plays a key role in successful delivery of online content to distance students Nanayakkara, (2007). In tandem with the same view is the finding by, Galamoyo, (2011) who noted that the ultimate delivery of an eLearning solution relies on the availability of appropriate and adequate technology. Similarly, Tucker and Gentry, (2009) reported that successful implementation of eLearning programs and curriculum depends upon the infrastructure being firmly in place.

Nanayakkara emphasize that developing online courses requires additional equipment and specialized software, for example, additional servers and a course management system. Student access requires network bandwidth and modem pools or internet service provider connections. The state of technology in schools provides some indication of the readiness of the education system. OECD (2020). A study by OECD (2020)

revealed that there tend to be very large gaps across socio-economic groups. Internet which is required for online learning was found to be for only privileged backgrounds that have a link to the internet in their homes. Hennesy.et. al, (2010) revealed that with limited access to electricity and phone lines, few people in Kenya have a computer at home.

2.3 Technical Support and Services for online learning
Effective support services are key to ensure quality online education UNESCO (2020). The support services of online education include two types: support services for teachers' online teaching and support services for students' online learning. Efforts should be paid to improve teachers' online teaching ability as both the synchronous and asynchronous online teaching tools are unfamiliar with most of the teachers.According to Sandholtz & Reilly (2004) learning designers and teachers should be supported in their quest to match learning tasks to learning technology, thereby improving their understanding as well as their effective use of technology. Research by OECD (2020) revealed that technical difficulties were reported as a major barrier to usage and a source of frustration for students and teachers.In a study by Demetriadis et al. (2003) lack of ICT technical support was as a significant factor affecting teachers' motivation to use digital resources.

2.4 Teachers Competencies on online learning
According to Pelgrum (2001), the success of educational innovations depends largely on the skills and knowledge of teachers. Findings by Hennessy *et al.* (2010) confirm that teachers and trainers who are mandated to provide e-learning in many secondary schoolsare lacking the skills to apply e-learning and therefore adopt an attitude of hostility towards ICT learning. One of the major predictors of ICT integration into teaching is computer competence of the teachers and this helps a lot in successful integration of ICT in teaching learning Berner (2003), Na (1993) and Summers (1990) as cited in Bordbar (2010). In support of the argument is Peralta & Costa (2007) who state that teachers with relevant competencies have higher confidence levels and greater ability regarding use of computers in teaching and have a considerable amount of computer experience with them. Francis-Pelton and Pelton (1996) maintained that, ''Although many teachers believe computers are an important component of a student's education, their lack of knowledge and experience lead to a lack of confidence to attempt to introduce them into their instruction''.

2.5 ICT Pedagogical skills
According to Stern, J. (2002), online learning is catalyzing a pedagogical shift in how we teach and learn. There is a shift away from top-down lecturing and passive students to a more interactive, collaborative approach in which students and instructor co-create the learning process.Correspondingly, research by Gomes (2005) concluded that lackof training in digital literacy, lack of pedagogical and didactic training in how touse ICT in the classroom, and lack of training concerning the use of technologieswere obstacles to using new technologies in classroom practice. Providingpedagogical training for teachers rather than simply training them to use ICT toolsis an important issue (Becta, 2004). According to Cox et al (1999) as cited in Bingimlas (2009) they argue that if teachers are to be convinced of the value of using ICT in their teaching, their training should focus on the pedagogical issues. Pre-service teacher education can help teachers to experiment with ICT before using it in classroom teaching (Albirini, 2006). This would make them have confidence when using ICT.

Ally (2004) found out that effective outcome of using technology in a classroom can be best achieved not just by using high end technology but constructive methods of teaching using technology that enhances student learning.
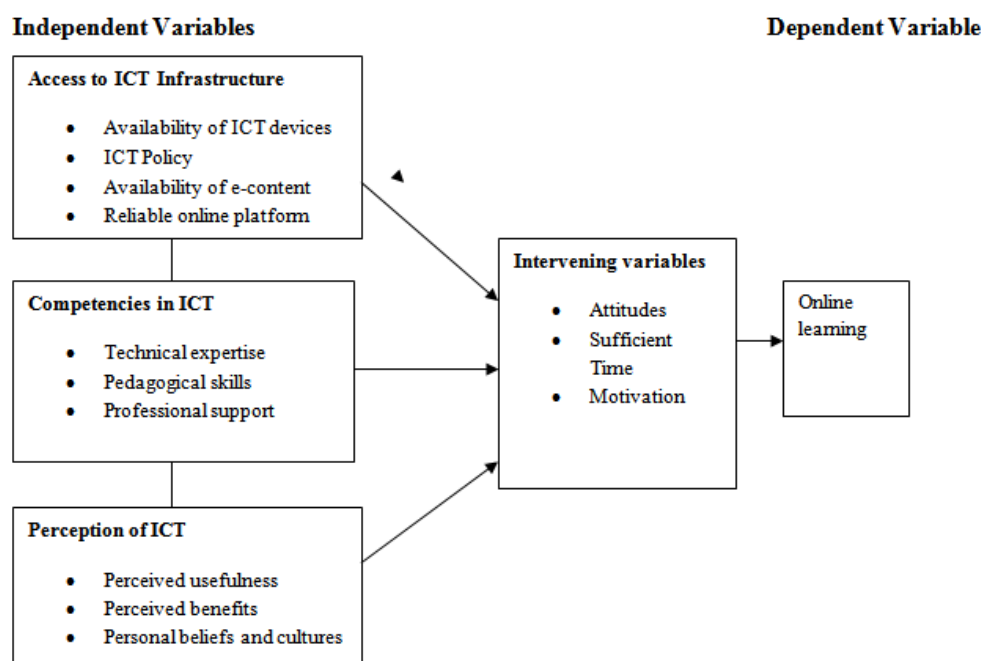
CONCEPTUAL FRAMEWORK

Figure-1: Conceptual framework factors that influence online learning

The conceptual framework was constructed to identify and describe relationships of key components within the study. In this study the independent variables; access to ICT, Competencies in ICT and perception of ICT were identified as factors that influence the effective implementation of online learning. Further, intervening variables support the independent variables in order to achieve the ultimate goal. For instance, positive attitude towards ICT would influence the teachers' perceptions on the usefulness of ICT, hence develop a desire to improve their competencies and further generate motivation to access and use ICT.

III. METHODOLOGY

This study adopted a descriptive survey design which employed both quantitative and qualitative methods to find out varied viewpoints on online learning. The study targeted Private Primary Schools in Athi River Sub-County, out of the over 300 schools, the researcher purposely selected 15 schools; those that were conducted online learning. Random sampling was used to select 150 teachers from Schools as simple random ensures that every respondent has a chance of being selected for study while also it saves on resources and time. A survey questionnaire was used as the main instrument in this study to analyze the perception of the target population on the effectiveness of online learning. The data was collected within two weeks through random distribution and some of the questionnaires were sent to respondents' email. The respondents were given 3-5 days to complete the questionnaire and send it back to the researcher for data analysis. After two weeks, all the complete filled-up questionnaires were gathered and collected for further data analysis by the researchers to get the output and findings for the research.The researchers used descriptive analysis to analyze the data.

IV. STUDY FINDINGS AND DISCUSSION

The study sought to establish the perception of teachers on the effectiveness of online learning. Findings are shown in tables 1, 2, 3, 4 & 5 below.

Effects of access to ICT infrastructure on online learning

Availability and access to ICT infrastructure is a strong indicator of the capability of an institution to effectively adopt online learning. The study sought to establish the capacity of schools as shown in **Table.1**

Statement	Yes	No
The school have developed ICT policy	20(13.3)	130(86.7)
The school have adequate ICT infrastructure	60(40)	90(60)
The school provided me with ICT infrastructure to use	48(32)	102(68)
The School have installed internet/bandwidth	50(33.3)	100(66.7)
I am able to access internet provided by the school	36(24)	114(76)
The school supported me in order to purchase data bundles	138(92)	12(8)

Research findings indicate that majority of the respondents 86.7% showed that their schools had not developed ICT policy. An ICT policy for schools stipulate formal guidelines, written statements or programmes that focus on how to use digital devices effectively for teaching and learning. Further findings reveal that 60% of the respondents do not have adequate ICT infrastructure in the schools. This contradicts findings by Tondeur et al. (2008) who alluded to availability of digital resources in schools to contribute significantly to increase teachers' willingness to incorporate ICT in classroom teaching. In addition, 68% of the respondents were not provided with ICT infrastructure hence limiting their access. This finding corroborates that of Plomp, Anderson, Law & Quale, (2009) who said that access to ICT infrastructure and resources in schools is a necessary condition to the integration of ICT in education Research findings indicate that 66.7% of the respondents' institutions lacked internet installation and 76% of the respondents are not able to access internet provided by the school even though, 92% are supported in order to purchase data bundles. This implies that the respondents are motivated through purchase of bundles to conduct online teaching hence increase access to ICT infrastructure.

What online platform are you using to teach?
Access to secure and safe online learning support platform is paramount for effective education. The internet avails varied options. The study explored the choices for different schools as indicated in **Table.2**

Item	Frequency	Percentage
Zoom app	83	55.3%
Google Classroom	47	31.3%
Microsoft teams	8	5.3%
Google Meet	7	4.7%
Others; Mzizi ERP,	4	2.7%

The results show that majority of the respondents 55.3% preferred Zoom, which promotes interaction and allows the use of video in addition to audio and text. These findings are in tandem with Chugh,R. (2010) who stated that video conferencing is gaining widespread popularity these days, especially because of the decline in Internet transmission costs. Further findings show that 31.3% of the respondents used Google Classroom. These results indicate that the preferred online platform is not accommodative to Special Needs learners.

Level of preparedness for online learning
The state of technology in schools provides some indication of the level of readiness to effectively implement online learning. This is anchored on previous experiences and exposure to online teaching as indicated in **Table.3**

Statement	Yes	No
The school is accustomed to online teaching and learning	46(30.7)	104(69.3)
The school have developed online curricular and content for all classes	38(25.3)	112(74.7)
The school provided professional support to teachers before starting online learning	122(81.3)	28(18.7)
Teachers were trained on how to use selected online platform	138(92)	12(8)
The school have sufficient qualified technical expert who provide technical support to teachers	60(40)	90(60)
I am able to prepare and use Instructional materials effectively	56(37.3)	94(62.7)
Some areas of the curriculum have been prioritized	126(84)	24(16)

The findings reveal that 69.3% of the respondents were not accustomed to online learning, moreover, they had not developed online curricular and content as indicated by 74.7%. Further findings show that 81.3% of the respondents were given Professional support and 92% were trained on how to use selected online platforms. In a study by Demetriadis et al. (2003) lack of ICT technical support was as a significant factor affecting teachers' motivation to use digital resources. Contrary to the findings, 60% of the respondents indicated that their schools lacked qualified Technical experts who could provide technical support. This implies that, Schools hired qualified expertise to support the teachers. Additional findings indicate that 62.7% of the respondents were not able to prepare and use instructional materials effectively even though, 84% prioritized some areas of the curriculum. This is an indication that there was inadequate preparedness for online learning.

Table.3Effects of teacher Competencies on online learning

Statement	Strongly Agree	Agree	Neutral	Dis-Agree	Strongly Disagree	Total
I have training on Introductory courses, internet use and general computer applications	17 **11.3%**	63 **42%**	21 **14%**	34 **22.7%**	15 **10%**	150 **100%**
I have skills to enable me apply online learning effectively	9 **6%**	41 **27.3%**	52 **34.7%**	29 **19.3%**	19 **12.7%**	150 **100%**
I have technical skills and can fix any hitch	5 **3.3%**	19 **12.7%**	24 **16%**	68 **45.3%**	34 **22.7%**	150 **100%**
I can search the internet for education reference material	37 **24.7%**	76 **50.7%**	26 **17.3%**	8 **5.3%**	3 **2%**	150 **100%**
I can connect to relevant online platforms without assistance	34 **22.7%**	88 **58.7%**	22 **14.7%**	6 **4%**	0 **0%**	150 **100%**
I can use digital camera and computer to produce video presentation	5 **3.3%**	8 **5.3%**	31 **20.7%**	83 **55.3%**	23 **15.3%**	150 **100%**

The research findings show that 53.3% of the respondents had basic knowledge and skills in ICT and 75.4% could search the internet for education materials. However, only 33.3% were able to apply the skills to online learning effectively and only 16% had technical skills to fix any hitch. This finding is an indication that the teachers' competencies were low and this could affect the effectiveness of online learning.

Table.4Perceptions on Use of ICT for Teaching and learning

Statement	Strongly Agree	Agree	Neutral	Dis-Agree	Strongly Disagree	Total
I feel confident and comfortable using ICT to teach	35 **(23.3%)**	21 **14%**	68 **45.3%**	16 **10.7%**	10 **6.7%**	150 **100%**
Lack of clear policies and strategies for online learning affect adoption of online teaching	74 **49.3%**	37 **24.7%**	23 **15.3%**	13 **8.7%**	3 **2%**	150 **100%**
I think the use of ICT increases students' confidence to participate actively in the learning.	12 **8%**	26 **17.3%**	49 **32.7%**	57 **38%**	6 **4%**	150 **100%**
I feel online learning enable me to vary my pedagogical skills	9 **6%**	20 **13.3%**	33 **22%**	61 **40.7%**	27 **18%**	150 **100%**
I think that ICT supported teaching makes learning more effective.	78 **52%**	42 **28%**	22 **14.7%**	5 **3.3%**	3 **2%**	150 **100%**
I think the use of online learning improves the quality of teaching and learning.	11 **7.3%**	34 **22.7%**	47 **31.3%**	53 **35.3%**	5 **3.3%**	150 **100%**
I think emphasis on curriculum delivery hinder use of innovative practices in teaching	89 **59.3%**	42 **28%**	13 **8.7%**	4 **2.7%**	2 **1.3%**	150 **100%**
I think ICT infrastructures are Valuable tools for teachers	79 **52.7%**	51 **34%**	16 **10.7%**	3 **2%**	1 **0.6%**	150 **100%**
Lack of parental support to the learners and the school affect the effectiveness of online learning	98 **65.3%**	13 **8.7%**	22 **14.7%**	11 **7.3%**	6 **4%**	150 **100%**
I am able to administer online assessment to learners and effectively evaluate their progress	17 **11.3%**	23 **15.3%**	48 **32%**	55 **36.7%**	7 **4.7%**	150 **100%**
I have more time to cater to individual students' needs through online teaching.	6 **4%**	24 **16%**	45 **30%**	63 **42%**	12 **8%**	150 **100%**
Current focus on ICT as a subject	35	76	27	7	5	150

affect integration of ICT use in subject teaching	**23.3%**	**50.7%**	**18%**	**4.7%**	**3.3%**	**100%**
I feel inadequate training and empowerment of teachers on application of ICT is an obstacle to online learning	73 **48.7%**	48 **32%**	18 **12%**	11 **7.3%**	0 **0%**	150 **100%**
I think online learning require a lot of time to prepare to be effective	73 **48.7%**	41 **27.3%**	13 **8.6%**	16 **10.7%**	7 **4.7%**	150 **100%**
I feel online learning widen the gap between the learners and teachers.	81 **54%**	33 **22%**	25 **16.7%**	9 **6%**	2 **1.3%**	150 **100%**

Research findings indicated that majority 80% of the respondents were in agreement that ICT supported teaching makes learning more effective, furthermore, 80.7% felt that inadequate training and empowerment of teachers was an obstacle to online learning. This suggests that more focus should be directed towards providing teachers with technical support in order to effectively adopt online learning. Further findings showed that 74% of the respondents concurred with the statement that lack of clear policies and strategies affect online learning and 87.3% agreed that emphasis on curriculum delivery hinder use of innovative practices.

The findings revealed that 74% of the respondents were in agreement that lack of parental support to the learners and the school affects the effectiveness of online learning. This implies that schools should promote parental involvement and engagement in their programs that promote online learning. This is especially due to the costs implications for availing internet and ICT infrastructure at home. Further findings showed that 74% of the respondents alluded to the statement that current focus on ICT as a subject affects integration of ICT use in subject teaching. This is supported by Russell (2001) who suggested that subjects should be adequatelyadapted for online delivery in order to achieve effective outcomes. In addition, 76% of the respondents thought that online learning requires a lot of time to prepare to be effective. However, an alarming 45.3% of the respondents felt they were neutral on their confidence to use ICT comfortably to teach. This implies that majority of the teachers were not sure of the ability to teach using ICT. The results do reflect the trend suggested by Mumtaz (2000) that if teachers feel competent and confident using ICT in the classroom they display a more positive attitude towards using ICT.

The above findings suggest that the teachers have a positive perception on the use of ICT for online learning. However, the reality shows that there were various obstacles encountered to achieve effectiveness as indicated below in **Table.5**

Challenges encountered with online learning

	Frequency	Percentage
Some families are not able to provide the devices hence not all learners participated.	48	32%
The indiscipline and weak learners do not put on the videos to hide their identity.	17	11.3%
It is not easy to follow up on learners who fail to submit assignments	33	22%
Unstable Internet and power blackouts	52	34.7%

Research findings show that 34.7% of the respondents indicated the main challenge experienced with online teaching was unstable internet and power blackouts. This finding corroborates with Anderson (1997) and Hennessy & Onguko (2010) who identified a range of physical and cultural factors that affect ICT use by teachers, including lack of reliable access to electricity, limited technology infrastructure (especially internet access, bandwidth, hardware and software provision), language of instruction and available software; geographical factors such as country size, terrain and communications; demographic factors such as population size, density and dispersion. This supports the 32% respondents who raised lack of devices by parents as a challenge.

V. CONCLUSION AND RECOMMENDATION
5.1 Conclusion
The study results found the teachers to have positive perception to online learning even during the pandemic. However, a number of factors were identified to hamper the effective implementation of the program as indicated in table 5. For instance, in regard to access majority 68% of the respondents were not provided with ICT infrastructure and 92% were supported in order to access internet. Schools should ensure that the ICT tools

being used by teachers are standard to provide quality of instruction. Effective learning requires reliable access to use technology solutions based on the available infrastructure.

Secondly, majority of the respondents 69.3% indicated that they were not accustomed to online learning and that was followed by 62.7% who showed they were not able to prepare and use instructional materials for ICT effectively. These results suggest inadequate readiness for online learning.

Lastly, out of the 150 teachers, 121(80.7) supported the statement that inadequate training and empowerment of teachers on application of ICT was an obstacle to online learning and 114(76) felt online learning require a lot of time to prepare to be effective. These findings show that though majority 80(53.3) of the respondents had acquired basic knowledge and skills to use computers they could not effectively conduct online learning.

5.2 Recommendations

- For policy, the government should emphasize that Schools develop ICT policies to guide specific practices that focus on how to first track adoption of online learning into the education curriculum.
- Strengthen public-private partnership in education to mobilize resources to support online learning initiatives in both private and public schools in Kenya.
- Finally, the study recommends for further research on quality of education provided through online learning with focus to curriculum coverage and assessment.

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