Africa Journal of Technical & Vocational Education and Training

ISSN 2518 – 2722
DOI: 10.69641/afritvet.2024.91185
Journal Website: https://afritvet.org

An Assessment of the Trainers' Competence in Implementing Online Teaching and Learning in TVET: A Case of Selected Institutions, in Nandi County

[1,2]Frank Kipkoech & [2]Prof. Bonaventure Kerre
[1]Ol'lessos Technical Training Institute & [2]University of Eldoret, Kenya

Abstract

Due to the ever-changing technological environment and digitization of education, Trainers need to use new technologies for content delivery to the trainees. The acceptance and willingness of trainers to use online learning is the key to success and is faced with various challenges. Trainers must use communication technology skills to fit successfully in a knowledge-based society. Moreover, regardless of the availability of technology, trainers need ICT skills for online teaching and learning. The study sought to assess the trainers' competence in implementing e-Learning in technical institutions. A descriptive research design was used in the study; structured questionnaires, both open-ended and closed, were issued to a sample size of n=77 trainer participants in the six selected technical training institutes in Nandi County. The study revealed that 81.8 % (n=63) of the respondents received prior technical training in e-learning. Trainers also reported difficulty in using the e-Learning platform. Technological expertise is essential to ensure the success of e-learning. Inadequate computer literacy hindered many trainers from content delivery using e-Learning, especially during Covid-19 lockdown times. It was evident that most trainers struggled with the online platforms, accessibility of learning equipment such as whiteboards, projectors, low internet connectivity, and inadequate training skills attributed to slow implementation. The study revealed that trainers had difficulty using the e-Learning platform issued. This is due to the inadequate training that they had received and the complex system used. The study found that trainers preferred other platforms which were user-friendly for e-Learning. Additionally, the institutions' LAN network is limited to the laboratories and institution library only; hence, some offices at a distance from the administration cannot access the LAN internet. Implementing online learning requires the stakeholders to come together to make online learning successful.

Keywords: ***E-Learning, ICT, implementation, technology***

Introduction

In 2020 according to UNESCO (2020), more than 1 billion and 575 million students in approximately 188 countries worldwide were affected by the closure of learning institutions due to the preventive measures taken by countries against the spread of COVID-19. World Health Organization recommended that self-isolation, social distancing, and prohibition of persons from assembling in large numbers had been confirmed by researchers as the main measures to combat the spread of COVID-19.

Due to isolation, technology has been considered the most appropriate alternative to keep educational systems functional in many parts of the world during this period (Mbunge, et al., 2020). COVID-19 made learning institutions to adopt online learning as education systems

need to be abreast with the rapid emergence of new technologies, thus making it a necessity in higher learning institutions in Kenya and the world over.

COVID-19 pandemic affected all countries globally, with most services either stopped or the mode of operation transited from face to face to virtual interfaces. Tamrat and Teferra (2020) stated that shifting to online learning was not a simple task, especially in a continent with only 24% of the total population accessing the internet, where there's poor connectivity, unreasonably high costs, and also frequent power interruptions. Online learning/ e-learning is the learning facilitated and supported with the help of Information and Communications Technology (ICT) through the internet. Unlike the developed world that has increasingly embraced e-learning, this is not the case in Africa.

In Africa, e-learning adoption has been slow because few scholars are familiar with online teaching (Houlden & Veletsianos, 2020). Further, as evidenced in Ugandan higher learning institutions, the absence of internet connection, technical incompetency, and negative attitudes have limited e-learning adoption (Kasse & Balunywa, 2013). Kenyan scholars have identified inadequate training and heavy workloads as the key reasons for reading materials being uploaded to e-learning platforms rather than having actual audio-visual online teaching (Tarus, Gichoya & Muumbo, 2015). Studies have advocated for adequate funds, policy, and infrastructure as the key pillars for e-learning success (Kashorda & Waema,2014; Bagarukayo & Kalema, 2015).

Most technical training institutions in Kenya have blended online learning with face-to-face learning and have lagged in its full implementation since they are experiencing particular challenges in using the platform. The education sector in Kenya was largely affected by the lockdown, where all the institutions were closed for the first two months. The government directive on e-learning was received with various challenges, with some institutions in the country failing to kick off learning due to technological challenges. On the other hand, technical institutions were heavily affected since most courses require face-to-face interaction to deliver course content.

TVETA reported slow implementation of online learning due to the lack of an established legal framework and standards to guide a proper roll-out (TVETA, 2020). Most trainees and trainers were challenged with the dynamics surrounding online learning. The turnout was low attendance and slow course coverage. The technical institution experienced various challenges during the Covid-19 online learning phases. Therefore, this study aims to determine the Trainer's competencies on implementing online teaching and learning in technical institutions during COVID-19 Pandemic in Nandi County Kenya.

Literature Review

E-Learning

Chokri (2012) studied issues contributing to adopting E-learning technology in teaching and learning by students in the university. The study considered the technology acceptance model (TAM) developed by Davis as its reference model (Davis, 1989). Study results showed that the influencing factors of students' positive opinion about the use of E-learning technology could be grouped into three key factors: expertise of learners in ICT technologies for learning, the design of E-learning adopted by lecturers, and the usability of the E-learning platform. The results above show that the study was inclined to variables linked to the Davis model that influenced students' opinions about E-learning technology in teaching and learning. The study did not consider other factors such as ICT infrastructural preparedness, lecturers' ICT skills, and technical skills possessed by ICT staff, which influence the rate of E-learning adoption and affect the continuous user acceptance of E-learning systems. Al-alak & Alnawas (2011)

conducted a study on measuring the adoption of E-Learning by lecturers; to understand their attitudes towards the system. The study adopted Technology Acceptance Model (Davis 1989) as its reference model. The research outcome was a proposed model, which indicated a positive relationship between perceived Usefulness, ease of use, computer knowledge, intention to adopt, and management support. However, there was a negative relationship between normative forces, anxiety about using computers, and intention to adopt; all these proved to be significant issues affecting users' behavioral intentions toward accepting a new system. This study did not address challenges facing E-learning user acceptance which may be influenced by factors such as ICT infrastructural preparedness and technical skills possessed by ICT staff on E-learning systems after academic staff's acceptance and adoption of E-Learning.

Johnson et al. (2011) researched the adoption of E-learning technologies in the learning process; to identify an innovative way to engage and motivate students in tertiary institutions. The research used case studies and was based on the activity theory framework in all the case studies. Johnson et al. (2011) found out that; 1) E-learning provides learner flexibility but requires careful design and monitoring, 2) E-learning tools can help bridge the gap between students' conceptual thinking and the natural world, and 3) some students do not like using technology as it challenges them to conceptualize new ways of learning. According to Johnson et al. (2011), the design and structuring of E-learning content is a vital component of E-learning system design. Additionally, the issues of technology use pegged to Al-Jaghoub et al. (2009) researched E-Learning adoption in institutions of higher learning in Jordan; to explore changes and challenges Al-Ahliyya Amman University faced in its quest to implement its E-learning program from an information system project point of view.

According to Al-Jaghoub et al., the original E-learning project plan to offer online courses faced issues due to the underlying methodology, which included; 1) Higher education was subject to the laws and regulations of the Ministry of Higher Education (MoHE), which stated that a certain percentage of any course was to be delivered using traditional teaching methods. 2) Developing an online course proved difficult and time-consuming and lacked key functionalities between students and lecturers. 3) There was a high turnover of human resources, which resulted in changes within the project team. Finally, 4) Technological uncertainty due to the time gap between signing and actual implementation of the project made it necessary to review the original specifications for the IT infrastructure, which seemed obsolete. From the above findings, the study suggests that rolling out practical E-learning projects needs a well-planned plan on several issues to guarantee safe delivery of intended objectives. From the analysis of the findings, the study considered government policies, human resources, availability of technology, and time aspects as the critical factors for the success of the E-learning project.

Russell (2009) studied a framework for managing E-learning acceptance in universities. The study aimed to explore the various methods individual lecturers use in adopting E-learning within their area of specialization work environments, hence developing a framework for analyzing university learning and teaching. From the findings, the study recommended a framework that suggested that a change in the university learning process required coordination across all activities previously handled separately in universities.

Trainers / Lecturers' ICT Skills in E-learning Systems

According to Namisiko, Munialo & Nyongesa (2014), besides lecturers having trained in their areas of specialization, they require ICT skills for successful interaction with E-Learning systems in higher learning institutions. According to Nagunwa & Lwoga (2012), universities should create awareness by training university staff to integrate E-Learning technologies into their curriculum delivery. To create awareness of the E-Learning technologies, the universities should inform lecturers about the existence of E-Learning technologies through all available

communication forums and also integrate ICT literacy and E-Learning into university curricula where all first-year undergraduate students are taught, post online tutorials on E-Learning and ICT literacy aspects and create links of all E-Learning sources at the university. Nagunwa & Lwoga (2012) stated that introducing E-learning programs at higher learning institutions had brought a paradigm shift for students and lecturers with various levels of academic experience. Lecturers should possess specific ICT skills to restructure their courses for successful integration into E-learning systems (Pirani, 2008).

The work for the ICT staff in E-learning systems has faced much dynamism and new demands in terms of the required skills. This transformation has been brought about by the constant emergence of relevant new technologies (Quadri, 2012). ICT staff is constantly required to embrace new technologies to adapt their skills in the ever-changing E-learning technologies to keep abreast with new technological advances. As a result, the profession exists in a state of uncertainty along with the emerging technologies, with traditional teaching methods being increasingly replaced by modern methods which deviate from the notion of a four-walled classroom; therefore, their job descriptions keep changing (Quadri, 2012).

Theoretical Framework

The theoretical framework adopted for this study was E-learning Technology Integration Model, a modified model of the original Technology Acceptance Model (TAM) by Davis (as cited in Shroff, Deneen, and Eugenia, 2011), which was meant to examine students' behavioral intention to use an electronic portfolio system with the aim of understanding how students use and fit it within the specific framework of a course. The study indicated that individual behavior to use electronic systems (for example, e-Portfolio) is driven by behavioral intention, where the behavioral intention is a function of an individual's attitude toward the behavior and subjective norms surrounding the performance of the behavior. Therefore, behavior is a function of both attitudes and beliefs.

The TAM model is chosen due to its solid framework for identifying issues that affect user acceptance of a wide range of end-user computing technologies that provide technical solutions.

Shroff, Deneen, and Eugenia, (2011) proposed the TAM to understand and predict the usage and adoption of information technology in a working environment but later was used to study user acceptance of services derived from systems such as E-learning. In TAM, Perceived Usefulness and Perceived Ease of Use are two main determinants of technology acceptance. Perceived Usefulness is defined as "the degree to which an individual believes that using a particular system would enhance his or her productivity," while Perceived Ease of Use is defined as "the degree an individual believes that using a particular system would be free of effort" (Davis, 1989).

Although many universities across the world have incorporated E-learning systems, the success of their implementation requires an extensive understanding of the end-user acceptance process (Park, 2009). Research on challenges facing user acceptance of E-learning systems at the University of Nairobi and Kenyatta University was therefore well suited to apply this framework as it deals with user perception and usage of the system (Farahat, 2012; Alharbi & Drew, 2014). Many universities that provide E-learning face enormous difficulties (Al-Adwan & Adwan Smedley, 2013). With the growing reliance on information systems and the increasing rapidity of the introduction of new technologies into the learning environment, identifying the critical factors related to user acceptance of technology continues to be an essential issue (Farahat, 2012).

Research Methodology

The research adopted a descriptive design to guide the research process. The design was used to allow the researcher to collect, summarize, present, and interpret data for clarification. The researcher gathered qualitative and quantitative data. The study was conducted in Technical and Vocational Education and Training (TVET) institutes in Nandi County are under the Ministry of Education, state department of TVET, offering TVET courses at Higher Diploma, Diploma, Certificate, and Artisan levels.

The study targets trainers, trainees/students from various departments pursuing different courses, and the principals in different institutions in Nandi county. The institutions were sampled using purposive sampling. According to (Cresswell & Plano Clark, 2011), purposive sampling entails identifying and selecting groups or individuals that are knowledgeable about phenomenon research of interest. A target population of 800 respondents was used. A proportional ten percent (10%) sample size was used on online learners and twenty percent (20%) for lecturers at respective institutions. The sample size was 80 respondents. Stratified random samplings were used since the population of lecturers/trainers and the staff was small compared to the number of students.

The main data collection tools for this study were questionnaires and interviews. The questionnaire was developed based on the objectives of the study. Five-point-like scale questions were used and developed based on the study objectives. The researchers administered the questionnaires to the lecturers. The researcher designed an interview schedule and used to collect information from principals. A pilot study was conducted at Rift valley technical training institute to test the questionnaire reliability and determine the consistency of the scales used to measure the study variables. The researcher's supervisors also reviewed the research instruments to ensure there is content validity of the instruments. Cronbach's coefficient alpha, was used to test the internal consistency of data collected. A reliability coefficient of 0.812 ($\alpha = 0.812$) was achieved and was considered reasonable for consistency levels.

Data collected were checked and entered into the analysis program IBM SPSS V26). Quantitative data were analyzed using descriptive statistics and presented using graphs, percentages, frequency tables. Interview data were analyzed quantitatively by use of content analysis. It was based on an analysis of meanings and the outcome from the respondent information. on ethical considerations the participants were guaranteed that the disclosed information was kept confidential for its intended purposes. The researcher sought permission from relevant authorities to conduct the research. Informed consent of participants was sought before being involved in the research. The participant anonymity was kept throughout the study and even to the researcher himself to guarantee privacy.

Results

Education Level of the Respondents

The education levels of the trainers in the institutions sampled are shown in Table 1. According to this study PhD holder comprise of 3 (3.9%), Masters 13 (16.9%), Bachelor's degree 45 (58.4%), higher diploma 13 (16.9%), and diploma 3 (3.9%). The findings indicated that ICT trainer's education levels had attained different levels of education ranging from Diploma, Higher Diploma, Degree, Masters and PhD. Most trainers had above Bachelor's degree qualifications 79.2% compared to 20.8% having diploma qualifications.

Table 1

Highest Academic Qualifications of Trainer's

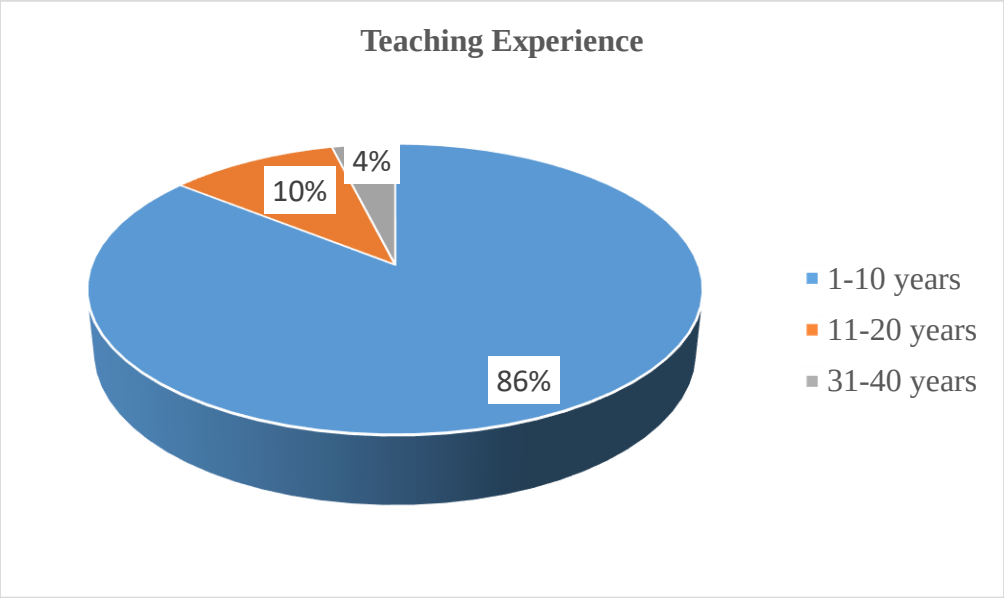
Education Level	*Frequency*	*Percent*
Phd	3	3.9
Master's	13	16.9
Bachelor degree	45	58.4
Higher diploma	13	16.9
Diploma	3	3.9
Total	**77**	**100.0**

Teaching Experience

From the study majority 85.7 % (66) of the trainers had 1-10 years, 10.4% (n=8) had 11-20 years and 3.9% (n=3) had 31-40 years teaching experience respectively as summarized in Figure 1. this indicate that most of the trainers had more than one-year teaching experience. Of the 77 trainer's respondents, the study found that 92.2% (n=71) of the respondents had personal computers at home or the workplace. The availability of personal computers eases the ability to deliver ICT-related content if one has the technical know-how to handle the device.

Figure 1

Teaching Experience of Trainers



The interview results showed that trainers in all the institutions began using e-learning technologies intensively after the Covid-19 pandemic. Some uses included course delivery, exam administration, and communication with students. "Most trainers did not have adequate

skills to deliver the online training to students, and the institution management organized training to help the trainers acquire the knowledge and skills to deliver the course content," one principal reported.

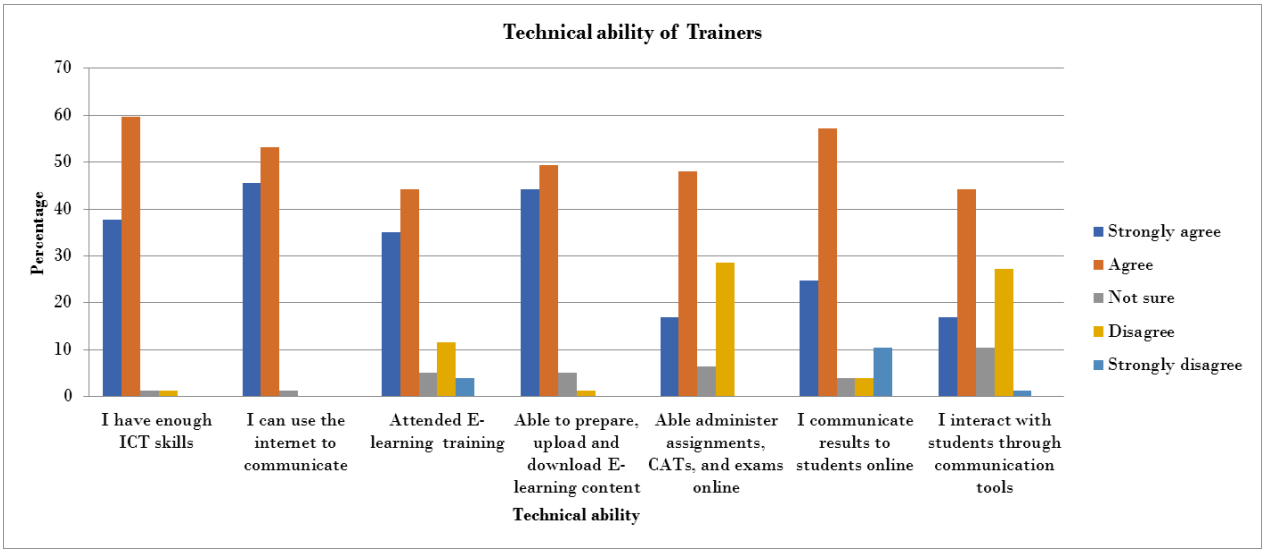
According to the study, all institutions reported that the ICT online training module contents conducted on the trainers included; setting the class attendance enrollment keys, the introduction to the online learning platforms, preparing and uploading lecture notes, setting continuous assessment tests (CATs), end terms exams, setting respondents lockdown used to track exam cheating, marking and uploading of results to the students.

Technical Capacity

The study sought to understand whether the trainers had received training of any kind since it was linked with the technological ability to handle online sessions of technical subjects to their learners. The study findings revealed that 81.8 % (n=63) of the respondents reported receiving technical or further training in the e-learning program. Interview sessions revealed that most lecture halls lacked whiteboards, projectors, and limited laptops. For example, one department could have one administrative laptop meant to be used by all trainers to teach and run administrative functions, often at the head of the department's desk.

Figure 2

Trainers' Technical Ability to Offer Online Learning



Most trainers are forced to own a personal computer to deliver the course efficiently. The study agrees with Tarus (2015) that found lack of technical skills on e-learning and e-content development by the teaching staff as hindering implementation of e-learning in Kenyan public universities. The finding attributes respondents' participation in e-learning programs to their preparedness to deliver online course content at technical institutes. The study agrees with Agufana's (2021) research that showed the importance of education for trainers to adopt information communication technologies when teaching students from technical training institutes.

Research shows that technical courses are offered mainly on skill-based and hands-on experience, making it hard for the course to be offered online. However, technical training institute trainers are reported to complement the use of ICT to facilitate their lectures since

ICTs make students attentive during instruction. ICT's use in instruction can revolutionize learning experiences, and ICT's use motivates learning (Agufana, 2021).

Trainers' Knowledge of e-Learning Resources

The study also assessed trainers' knowledge of e-learning resources to determine whether they fit to deliver teaching and learning through online platforms as indicated in Table 2. The findings show that 66.6% (n=59) of the trainers used e-learning resources in teaching and learning at the institution. However, 97.4% of the respondents had enough ICT skills to facilitate teaching and learning using ICT resources and 90.9% often used computers and related ICT technologies in their lesson preparation, teaching, and learning. Tarus (2015) study reported lack of technical skills on e-learning and e-content development by the teaching staff as a challenge hindering the implementation of e-learning.

Table 2

Trainers' Knowledge of e-Learning Resources

	Frequently	More Frequently	Not Sure	Rarely	Very Rarely
How often do you use e-learning resources in teaching and learning at the institution?	19.5% (n=15)	57.1% (n=44)	5.2% (n=4)	18.2% (n=14)	
I have enough ICT skills to facilitate teaching and learning using ICT resources	37.7% (n=29)	5 9.7% (n=46)	1.3% (n=1)	1.3% (n=1)	
How often do you use computers and related ICT technologies in your lesson preparation, teaching, and learning?	19.5% (n=15)	71.4% (n=55)	1.3% (n=1)	6.5% (n=5)	1.3% (n=1)

Through the trainers' interviews and principal's interview schedules, the study found that despite the various abilities of technical institutions to make online learning success, it was evident that the majority of the trainers struggled with the online platforms, accessibility of learning equipment such as whiteboards, projectors, low internet connectivity, and inadequate training skills. Some mentioned too much workload, thus unable to follow up with students considering the workloads, and the challenge of teaching a technical course online made it difficult for students to understand the concept, which translated to poor results in their module Kenya National Examination Council examinations. Through the trainer's questionnaire and principal's interview schedules, the study found that despite the various abilities of technical institutions to make online teaching and learning success, it was evident that the majority of the trainers struggled with the online platforms, accessibility of learning equipment's such as whiteboards, projectors, low internet connectivity, and inadequate training skills.

The trainers also lacked technical skills that can assist in online e-content development. This was a major challenge in the implementation of online teaching and learning in the technical institution. The above was attributed to most trainers not having adequate training on e-learning platform use. Despite some trainers having basic computer skills, it was inadequate for application in developing and delivering the e-learning content to the learners. Tarus (2011) found out that academic staff in learning institutions have low ICT skills because they were trained in an environment without ICT facilities. The trainers needed the motivation to encourage them to focus on online teaching and learning. The motivation results from extra charges that trainers may incur during non-teaching hours, and trainees need assistance. There was fear of job loss among trainers since online learning can accommodate many students, thus reducing the workforce.

The challenge of teaching a technical course online made it difficult for students to understand the concept, and this was translated to poor results in their module Kenya National Examination Council examinations. The research found that the major hindrance to online teaching and learning institutions in Nandi county was the lack of adequate internet bundles. The high cost of internet bundles, thus rendering it unaffordable to most institutions and higher than developed countries.

Conclusion

The trainers lacked commitment to using the e-learning platform in teaching and learning. The trainers access computers at work or home, but they do not use them to deliver online classes because of their low competence in computer operation and use. The trainers do not have adequate training and some of them attended training once, and some have not been trained completely on online teaching and learning content preparation and delivery.

Trainers engaging in e-learning require a range of Information and Communication Technology skills for them to effectively teach in online platform. Key skills required by trainers are; proficiency in e-learning platforms, video conferencing tools, content creation and sharing, online assessment tools, and collaboration tools. Additionally, trainers should be familiar with virtual labs, web conferencing etiquette, digital communication methods, and maintaining a professional online presence.

The TVET institutions should ensure that the trainers are trained frequently on e-learning. The regular training will enable trainers to be familiar with the platform used in e-learning, and it will enable trainers to upgrade their skills due to changing technology and regular updates of the system. There is need to recognize the need for skill among trainers and should be recognized as essential for teaching electronically since ICT training among trainers give confidence in the online platform.

References

Agufana, P. B. (2021). Instructional usefulness of ICT's as perceived by lecturers in technical training institutions in Kenya. *International Journal of Education and Research.* **9,** p 87-97.

Al-Adwan, A., Al-Adwan, A. & Smedley, J. (2013). Exploring students' acceptance of e-learning using technology acceptance model in Jordanian universities, *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 9*(2), 4-18.

Al-alak, B. A. & AlnawasI. (2011). Measuring the acceptance and adoption of e-learning by academic staff: *Knowledge Management & E-Learning: An International Journal* 17(1), 3–19.

Alharbi, S. & Drew, S. (2014). Using the technology acceptance model in understanding academics' behavioural intention to use learning management systems, *International Journal of Advanced Computer Science and Applications, 5*(1), 1-13.

Al-Jaghoub, S., Al-Yaseen, H., Hourani, M., Al-Haddadeh, R. & Salim, M. (2009). E-learning adoption in higher education in Jordan: Vision, reality and change. *European and Mediterranean Conference on Information Systems, 1-10*.

Bagarukayo, E., & Kalema, B., (2015). Evaluation of e-learning usage in South African universities: A critical review. *The International Journal of Education and Development using Information and Communication Technology*, *11*(2), 168-183.

Chokri, B. (2012). Factors Influencing The Adoption of the E-Learning Technology in Teaching and Learning by Students of a University Class, *European Scientific Journal* 8(28), 165-190.

Cresswell, J. W.& Clark, P. L. (2011), Designing and Conducting Mixed Methods Research. 2nd Edition, Sage Publications, Los Angeles. https://www.scirp.org/reference /References Papers? Reference ID=1596237 Davis, F. D. (1989). *User acceptance of information technology: system characteristics, user perception and behavioral impacts*. University of Michigan, Business School, 38, 475– 487.

Farahat, T. (2012). Applying the Technology Acceptance Model to Online Learning in the Egyptian Universities, 64, 95-104.

Houlden, S., & Veletsianos, G. (2020). Coronavirus pushes universities to switch to online classes - but are they ready? The Conversation. https://theconversation.com /coronaviruspushes-universities-to-switch-toonline-classes-but-are they- ready-132728 4.

Johnson, J. L., Adkins, D., & Chauvin, S. (2020). A review of the quality indicators of rigor in qualitative research. *American Journal of Pharmaceutical Education*, 84(1).

Kashorda, M., & Waema, T. (2014). *E-Readiness survey of Kenyan Universities (2013) report.* Nairobi: Kenya Education Network.