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Evaluation of the Extent to which Institutional Based Factors about e-learning Adoption Influenced trainees' performance in the Selected Engineering Programmes of TVET institutions in Kenya

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Abstract
The rapid pace of economic development in the world has initiated and demand for technological growth in education and training system as a global yard stick for continuous improvement. As internet connectivity expands, online education and training content becomes readily available. This, therefore, calls for broader networking opportunities and adoption of Information Communication Technology (ICT) to improve access and performance in education and training for lifelong learning. There is a marked improvement by the government investment in e-learning in tertiary institutions in Kenya while trainees' performance in national tests is declining. The specific objectives of this study were: to determine the influence of trainers' based individual factors about e-learning adoption and trainees' performance in selected engineering programmes in TVET institutions in Kenya, to examine the influence of technological based factors in the adoption of e-learning paradigm and trainees' performance in selected engineering programmes of TVET institutions in Kenya, to evaluate the extent to which institutional based factors about e-learning adoption influenced trainees' performance in the selected engineering programmes of TVET institutions in Kenya and, to determine the influence of trainers' demographic factors in adoption of e-learning paradigm and trainees' performance in the selected engineering programmes of TVET institutions in Kenya. The target population for the study was 5544 comprising of the principals, trainers, technicians and trainees from 14 technical institutions that were implementing e-learning between 2016 and 2020. This research study used a sample size of 568 people from four technical institutions. Standard multiple linear regressions at α= .05 was used to test the determinants of trainers' adoption (individual, technological and institution) of e-learning have significant statistical influence on trainees' performance in national examinations in TVET institutions in Kenya. The study therefore recommends that: the Ministry of Education should train TVET trainers and equip them with e leaning competences.

Key words: Performance, e-learning adoption, institutional factors

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I. Background to the Study

Previous study has shown that successful technology adoption in institutions is the outcome of strong leadership in an organization. Anderson and Dexter (2005) agreed, finding that institutional leadership should be able to examine and evaluate academic and administrative applications of technology and make decisions based

on their findings. As a result, persons in charge of institutions must not only study and understand how to use technology, but they must also guarantee that other members of the institution's personnel have access to learning opportunities. They should also be in the forefront of supporting training for the rest of their coworkers. This is due to the fact that strong leaders are known to encourage their employees to utilize technology primarily as a tool to achieve educational objectives (Anderson & Dexter, 2005). In addition, the leader must be able to build and explain a clear and shared vision for the use of technology in schools, as well as the capacity to alter and manage change. To do this, the leader must be aware, competent, and supportive of e-learning in order to properly administer an e-learning program. As a result, it appears that educational institutions should explicitly identify their e-learning policies and goals, as well as have a defined development plan and strategy in place to incentivize trainers and trainees to use e-learning in their process of teaching as well as learning.

According to Rhema and Miliszewska (2011), trainers were more motivated and dedicated when they knew upper management was helpful and encouraging. According to Mapuva (2009), senior management in a company may either break or make e-learning happen due to their decision-making position in their institutions. As a result, senior management support was discovered to be critical in the implementation of e-learning technologies. This demanded complete and unwavering support for e-learning implementation in TVET institutions. The senior management of the institutions might provide the necessary conditions, such as ICT policy, incentives, and resources. According to Sife et al. (2007), the most important component for effective ICT adoption is the dedication and interest of senior management in TVET institutions and other leaders at all levels. Dwyer et al (1997) noted that in order for ICT integration to be effective and sustainable, administrators must be proficient in the use of technology and have a thorough awareness of the technical, pedagogical, administrative, financial, and social components of ICTs in education.

1.1.1. Leadership Support

Though ICT infrastructure support is critical, institutional technology leadership is a better predictor of trainers' use of e-learning technologies in the classroom (Anderson & Dexter, 2005). According to Yee (2000), a leader who executes technology plans and shares a shared vision with trainers encourages them to employ technology in their teaching. Schiff and Solmon (2017) stated that strong leadership is required to push well-designed technology programs in institutions for successful faculty adoption of ICT (as cited in Lai & Pratt, 2004, p.462). Becta (2004) discovered that the impact of e-learning on teaching in primary schools in the United Kingdom also emphasized the importance of excellent leadership (as cited in Lai & Pratt, 2004, p.462). Furthermore, Becta highlighted five elements that must be present in learning institutions if ICT is to be implemented (as cited in Lai & Pratt, 2004, p.462). These factors were information technology resources, information technology teaching, information technology leadership, general teaching, and general leadership. According to the news source:

"Although ICT opportunities are typically provided by the classroom teachers, the quality of leadership and management of ICT in a school is crucial to the provision of good ICT learning opportunities. As the quality of ICT leadership improves, so does the percentage of schools providing good quality ICT learning opportunities" (as cited in Lai & Pratt, 2004, p.462).

Wong and Li (2008) discovered that leadership encouragement of cooperation and lecturer devotion to student-centered learning promoted effective e-learning transformation in eight Technical University colleges in Hong Kong and Singapore. In a quantitative report led by Ng (2008) on parts of groundbreaking administration with 80 Singaporean auxiliary instructors, he tracked down that a groundbreaking initiative with characteristics of distinguishing and articulating a dream, advancing acknowledgment of gathering objectives, offering individualized help, offering scholarly incitement, giving a proper model, making superior assumptions, and reinforcing school culture could impact the adoption of e-learning. Afshari et al. (2009) discovered a link between a leader's degree of ICT proficiency and transformational leadership practices in another study. As a result, transformational leadership may aid in the integration of ICT into teaching and learning processes, hence improving student outcomes.

Similarly, Yuen, Law, and Chan (2003) conducted a case study of 28 Hong Kong TVET institutions and discovered that in catalytic adoption model institutions, the principal is the key change agent, providing visionary leadership, staff development, and involvement, whereas in cultural innovation models, multiple leadership is displayed where the principal is not necessarily involved in ICT leadership, and trainers are free to adopt new ideas in supportive and enhancing culture. Furthermore, studies have indicated that distinct levels of leadership, such as principal, administrative, and technological leadership, have an impact on the successful usage of ICT in institutions (Anderson & Dexter, 2005). This facet of leadership will assist the principal in delegating responsibilities to subordinates while focusing on the institution's technological adoption and integration. Institutions are made simpler by executive engagement and decision-making, fortified by an ICT plan, and efficiently use ICT in the classroom.

1.1.2. E-Repository

The majority of institutional as well as national library preservation repository systems save theses, dissertations, and legendries, as well as other print material. In Sweden, an e-repository is one of the most advanced preservation methods at electronic centers in industrialized countries. This approach uses the electronic copy as the digital master for the document's electronic and print versions (Main & Orodho, 2016). In most situations, specific repositories produce archival copies as part of the publication process, which are then distributed to national libraries and uploaded to distant library databases for public access. The purpose of e-repositories deployment in educational and training institutions is to improve an institution's archive of publications and/or dissertations, which helps to boost access and even re-use of academic information (Kaume-Mwinzi, 2016).

The extent to which learning institutions produce scientific and technical information that is treated as electronic record and relevant to learners depends on the adopted practice of the institution. E-records efforts have demonstrated to have a significant impact on the overall digital preservation landscape and users' performance (Hana, 2013). The adoption and implementation of e-records and content began several years ago with a series of pilot projects that aimed to create specifications for an operational system to manage large scale of e-records and learning environment. This system is regarded as comprehensive and dynamic means for storing electronic record in a specific format for use and re-use. In reference to education and training, Hassel (2017) define institutional repository is as a set of services that the institutions offers to students for access to digital materials created by the institution and its community members. The principal impact of the institutional repository has been in academic performance aspects and institutional management where institutions have broadened the types of materials they place in their repositories to include all those materials of long term value produced both by trainers and trainees (Dimmock & Tan, 2016).

According to current study, full text content has transitioned from print medium to e-mail, downloads, and web access. Many of these items are received and kept electronically, along with a broader variety of materials gathered, resulting in vast libraries of digital information (Monroe, Dennis, & Johnson, 2012). Concerns about long-term preservation of e-print archives are entirely dependent on the circumstances of filling the repositories. As a result, more emphasis should be placed on academic material, and preservation should be included as part of the process of creating an open archive (Sullivan, 2009). The requirements and feasibility for e-print preservation are often compared and contrasted on a cost benefit analysis before decisions are implemented on their development (Dahlma, 2007).

In most countries, student learning is traditionally classroom based with the priority placed on students' academic performance (Schmidtke, 2015). Over the past few years in America, the curriculum at technical college of personnel learning has changed and these changes revealed that the curriculum is about learning beyond the classroom. This leads to both challenging and interesting learning, (Kathleen, Tweedy, Edwards, & Kimmel, 2017). Education and training institutions world over are increasingly responding to technological demands of the education sector by offering online learning opportunities to create a rich teaching and learning environment to improve students' performance. Teachers often appreciates the convenience of real time technology to support learning, but resources in TVET in TVET institutions are often not aligned to meet these needs (Chow & Croxton, 2017). This study sought to determine influence of e-repository construct of institutional factor and trainees' performance in TVET institutions in Kenya.

1.1.3. Virtual Learning Environment

Researchers have defined e-learning as the development of a platform where teaching and learning takes place through electronic means. This definition covers Information Communication and Technology-based learning, internet, mobile devices and other application. The European commission defines e-learning as the improvement of quality of people by using technology to facilitate remote exchange of information. E-learning improves the management of teaching and learning (Boezerooij, 2006). In the recent past, E-learning has increasingly become a major component integrated in most TVET institutions learning platforms to improve education delivery and support processes (AlKhuder & AlAli, 2017). Sharing of knowledge is important both nationally and internationally and can be promoted through the adoption of e-learning paradigm to a wider scale and creating awareness (United Nations Development Agenda, 2015).

The key priorities of e-learning put emphasize on the development of infrastructure, content, and teacher training and networking. In 2003, ninety three percent of the European commission institutions were connected to the internet (Salajan & Roumell, 2016). Currently, there is a high speed internet connectivity amongst tertiary and research based institutions whose aim aims is to reskill the work force through e-Learning paradigm and virtual learning satellite campuses (Uzunboylu, 2006). The advantages of technological facilities outweigh the cost implications of adopting and promoting lifelong learning. Multi-tasking has several implications of divided attention and affecting student performance. There is great concern on the impact of multi-tasking on student's grape point average, test performance, efficiency and recall ability (Agaard, 2018).

Teaching and learning in a regulated education and training environment is no longer guarantee that one will secure a job and hence, the introduction of lifelong learning courses. Research findings shows that online learning direct communication with students and has a great influence on students receiving quality and personalized information. It also provides them with access to a wide variety of discussion topics (Santoveña, 2011). Technologies adopted and implemented in education and training institutions tend to foster mobility for students although the main effect depends on the teachers use and application of this facility which affects student's attitude about the facilities (Almenara, 2010).

M-learning is another form of virtual learning that has created a high level of efficiency in the education learning environment. Learning institutions in China have shifted from traditional paper and figure print classroom sign in for lessons by introducing high technology mobile scan bar code for classroom session sign in (López & Silva Pérez, 2014). Multitasking is considered an efficient way of doing things in the work place, however in the context of student learning it is believed that students only have the ability to take up one thing at a time (Lin, Mills, & Ifenthaler, 2015). Training can develop a management techniques and skills essential for to promote high productivity of multi-tasking amongst students. This promotes a culture of working smart and not just working hard (Singh, 2013).

TVET trainees support multitasking and state that it increases their performance. Institutions use classroom technology which is more productive than the traditional methods of writing on black boards, but they have policies that discourage classroom multitasking (May & Elder, 2018). Research findings shows that blended learning encourages information sharing and communication amongst students which changes their perception about the learning environment. Although blended learning preceded instructional technology its evolution is bound to information communication technology (Pima, Odetayo, & Iqbal, 2018).

Institutions are faced with pressure to develop educational environment that is responsive to contemporary student's lifestyle (Dziuban, Graham, Moska, Norberg, & Sicilia, 2018).

Technology has proved successful in balancing students work load. Massive open online courses have developed as new ways of acquiring knowledge and are more useful when integrated with classroom technologies (Bralic & Divjak, 2018).

In the tertiary education industry of Africa, education structures are questioned by students through protests I fight for change and shift from traditional thinking (Špiranecis & Kos, 2013). Authors argue that the promotion of design thinking mid set around the use of technology and learning could support academic innovation (Gachago, Morkel, Hitge, Zyl, & Ivala, 2017). Research indicates that e-learning is at its initial stage in Kenya TVET institutions. Most of this universities lack structural senate approvals to enforce policy implementation of e-learning. There is also lack of technology infrastructures and skills. Study conducted on USIU-A and Jomo Kenyatta University of Agriculture and Technology showed that these institutions had audio visual facilities for content delivery but were not optimizing the use of these facilities (Makokha & Mutisya, 2016).

1.1.4. Institutional Learning Software's

Past research indicated the preference of Moodle as compared to black board (Zafer & Aslihan, 2014). Info COMM is software used in Asia that gives students access to lessons, textbooks, projects and serves as basis for learning content and application. Forty eight percent of working students in the University of Fiji indicated the use of e-learning as a domain for knowledge (Sharma & Mishra, 2007). Mobile learning and other seamless learning tools are often integrating to access school learning material for students without computer devices. Mobile devices are often used for communication and acquisition of information. The twenty first century of digital learning offers mobile applications that are used to access learning applications (Kala, 2013).

Mobile devices offer a self-directed learning experience with a rich scope of access to information at the student's finger tips. Researchers claim that the twenty first generation populations are born with digital technology (Kee & Zarina, 2014). These devices are seen to be disruptors of local social interactions they provide access to a global communication platform. Students with mobile devices often use them to manage their day to day tasks and ease their learning process (Tho & Yeung, 2014). Updated information is easily accessible from anywhere, at any time that it required. This information can be reviewed for understanding to answer questions that students may have on classroom taught material. Mobile devices for learning do not serve the same purpose as computers (Berson, Berson, & Manfra, 2012).

Learning is a continuous process that is embraced well through technology (Lai, Hu, & Lyu, 2018). Same parents have a negative attitude towards technology for their children, especially when it comes to mobile phones as they feel they don't have control over the accessed content. There are however parents who embrace technology and would prefer mobile devices over phones due to easy access of information (Lauren, 2018). Mobile phones create a passive transfer of information that allows students work smarter. The traditional education policies do not allow the use of mobile phones in classrooms which is seen as a limiting factor student's continuous learning. In developed countries a mobile phone is as good as a computer used for learning.

In developing countries mobile phones are tools to close the gap for the digital divided society who cannot afford computers (O'Bannon, Waters, Lubke, & Cady, 2017).

The complexity of learning software's is often mitigated through manuals which are expected to serve as prescriptions on how to use applications. Though some student may not be technically literate it takes a while for them to maneuver through the digital learning platforms while other have an idea of how to go about the digital learning tools (Murray, 2016). In India students in rural areas were given mobile devices for educational purposes as they would not obtain a learning opportunity if not for digital learning tools. These devices had preinstalled education programs that provide motivation and a reasonable level of academic learning (Mishra, 2009). The Somalia life livelihood program has used mobile devices to teach literacy and provide a learning opportunity for people who might not obtain these facilities (Mtebee & Raisamo, 2014).

Building customized e-Learning software requires time and professional skills. Learning software's is course management tool for online learning. It allows developers to customize the system to satisfy specific needs and it works compatibly with internet platforms (Chung & Ackerman, 2015). The main aim of this software is to provide tools that support discoveries of online study material. It provides a platform for collaboration with other students. Technical support in using this software is critical as teachers don't have the professional skills. The software must be configured according to teacher's interface, content and student interface (Petrovic, Jeremic, Cirovic, Radojicic, & Milenkovic, 2014). Simplicity is enables easy and enjoyable use of the software which motivates learning and of interest in course material (Kotzer & Elran , 2012).

Black board is a virtual learning tool used for efficiency and productivity in the education environment (Blackboard , 2018). It offers an interface that is usable by the instructor, the student and administrative support. The software is not just applicable in higher institutions of learning but also compatible with high school systems (Tonsmann, 2014). The only institution that has integrated the use of blackboard in Kenya is the United Stated International University-Africa while other universities are more comfortable with Moodle. The software is compatible with mobile devices hence allowing students to get accesses to study content and learning resources at their figure tips (Alturki, Aldraiweesh, & Kinshuck, 2016).

1.2. Statement of the Problem

Literature available shows that many countries embrace adoption of e-learning paradigm in teaching TVET programmes with lots of challenges. Buabeng-Andoh Charles, (2012) in their study found that there was low level of e-learning adoption in TVET institution. In Kenya, like many other developing countries in the World, Engineering sector is a key pillar in the realization of the Vision 2030 and the Kenya's 'Big Four Agenda. Due to increased sophistication and modernization in engineering and manufacturing sector colloborated by demand for quality graduates from tertiary institutions has put much pressure on education and training institutions to adopt new and innovative teaching paradigm shift to influence trainees' performance. This has been exacerbated by out-break of COVID-19 pandemic that has disrupted learning in the globe. Kafu (2019) argues that e-learning as a paradigm shift is an emerging innovation that facilitates students' learning in a technologically enabled environment. New teaching as well as learning innovations are introduced by technology, and their practical value cannot be overstated (Lagrange, 2003)

Despite the prevalence of e-learning in all aspects of modernized human experiences, and despite the fact that the modern learner lives, moves, communicates, learns, socializes, and works in a technology-driven environment, e-learning has yet to be adopted in TVET institutions that are designed to train prospective tradespeople for social and economic development (Onasanya etal, 2010). Trainees' performance in national examinations is declining raising concern among education and training stakeholders as to what is ailing TVET sector (Onasanya etal, 2010).

II. Methods

The study used a cross-sectional descriptive survey strategy, in which data was gathered once over the study's period and evaluated. The target population for the study was 5544 comprising of the principals, trainers, technicians and trainees from 14 technical institutions that were implementing e-learning between 2016 and 2020. This research study used a sample size of 568 people from four technical institutions. Structured questionnaires as well as interview guide were used to obtain primary data. A study of records and documents was used to gather secondary data. In the data analysis, descriptive and inferential statistics were utilized.

III. Results

3.1 Top Management's Support

According to the findings fifty-three per cent (53%) of the respondents agreed that the top management offered the much needed support while twenty eight per cent (28 %) disagreed. Further, Nineteen per cent (19%) were not sure, as shown in figure 4.10. The findings that top management offered the much needed support were in line with those of Afshari, *et al.*, (2013 and Neufeld (2009). Another study by (Neufeld, 2009) established

that top management support had three major roles in regard to supporting e-learning implementation. The roles identified included the provision of funds, technologies, staff, and user training programs.

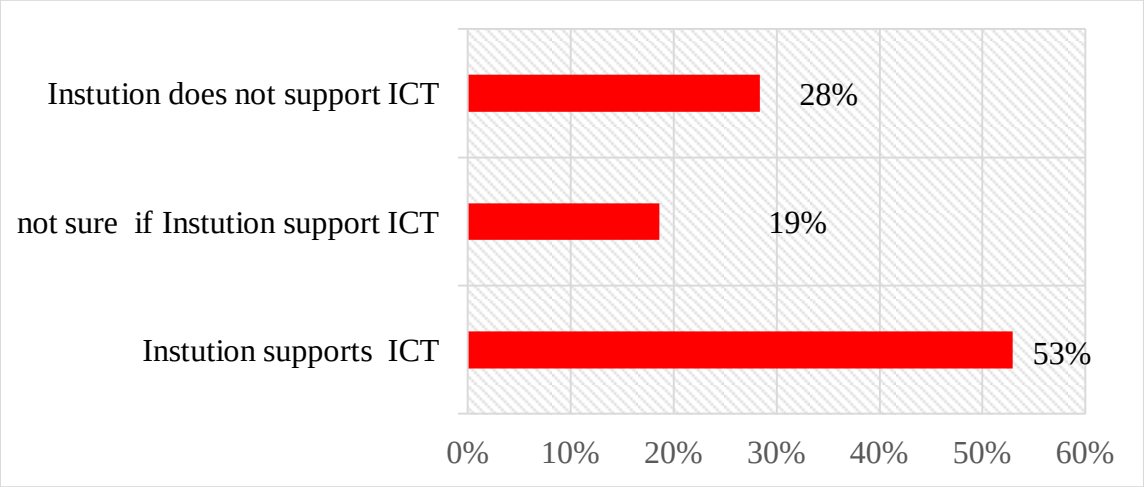

Figure 1.1: Top Management Support

Source: (Author, 2021)

Additionally, the study by (Neufeld, 2009) posited that the behavior of managers had a direct influence on the implementation of technology. Therefore, for e-learning implementation to succeed, the top management played its rightful role and offered support services necessary for the success of e-learning practice. It meant that it was mandatory for the managers to obtain feedback, address user concerns and questions regarding the system.

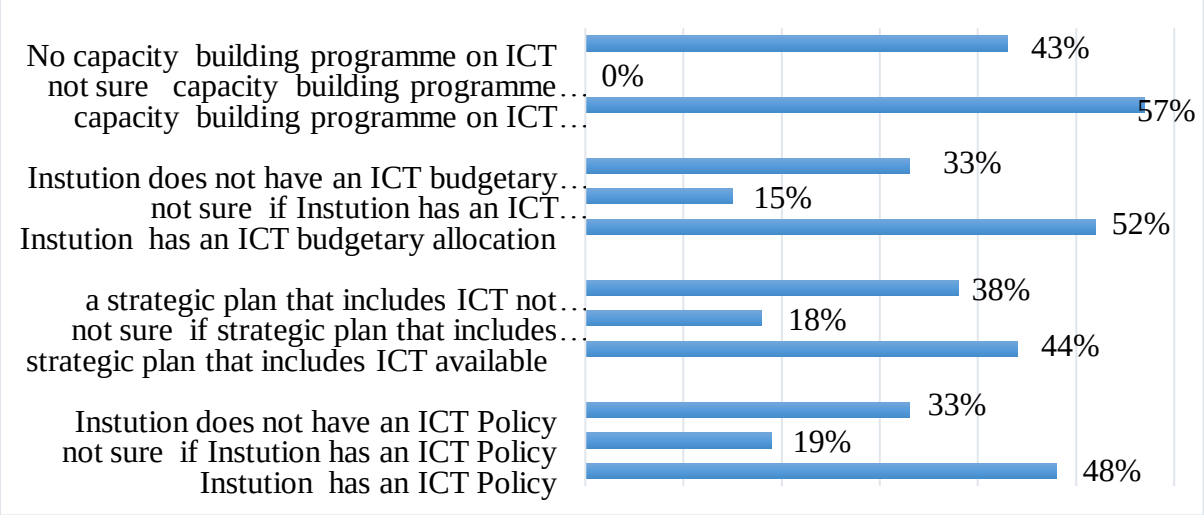

Figure 1.2: Availability of Policy Guidelines

3.2 Policy Guidelines, Strategic plan and budgetary allocation on the E-Learning Content

From the findings, forty eighty per cent (48%) of the respondents indicated that there is a policy guideline on e-learning content while thirty-three per cent (33%) indicated of the respondents indicated that there was no policy, as shown in figure 1.2. This was in-line with the findings by Ezeugbo & Asiegbu (2011), who concluded that when policies were in place they guided the adoption and implementation hence minimizing the challenges that could be encountered. Further to that, policies on the acquisition and use of e-learning infrastructure, hiring of trained technical support staff and faculty should be put in place and in order to enhance the teaching and learning. The admission of students at the appropriate time should also be stated proactively.

Strategic management started by Burns and Stalker in 1961. This theory states that strategic management practices may change in organization comparison. In this theory, every organization has its own strategic factors (Gichaga 2014). The assumption of the theory is that strategic factors cut across the organization, but a number of strategic factors are unique to the specific organizations. The changing of strategic factors has also been reviewed as the methods of strategic management. The strategic management factors can

help management to improve performance. These strategic factors can change the operations of an organization. The organization may want to change the technology used to a more modern strategic use and efficient way of handling processes and providing its services. It may then consider installing a computer based system that must achieve its performance.

3.3 Multiple linear regression on institutional based factors and student performance on adoption of e- learning.

Multiple regression analysis was conducted to test if Technological Factors have influence on trainees' performance in selected engineering courses.

Table 1.1: Summary on institutional based factors

R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
.564[a]	.319	.283	12.538	.319	8.977	5	96	.000

Source: (Author, 2021)

Table 1.4: ANOVA on institutional based factors

	Sum of Squares	df	Mean Square	F	Sig.
Regression	7055.886	5	1411.177	8.977	.000[b]
Residual	15091.457	96	157.203		
Total	22147.343	101			

Source: (Author, 2021)

a. Dependent Variable: students passing with Credit in examinations

Predictors: (Constant),

b. capacity building programme on ICT,
c. ICT Policy,
d. ICT budgetary allocation,
e. strategic plan that includes ICT,
f. supportive to ICT Use in teaching

Table 1.6: Coefficients on institutional based factors

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	36.379	3.103		11.723	.000
Institution is supportive to ICT Use in teaching	3.718	4.481	.336	.830	.409
Institution has an ICT Policy	1.076	2.417	.098	.445	.657
institution has a strategic plan that includes ICT	2.707	4.094	.248	.661	.510
Institution has an ICT budgetary allocation	-5.170	2.802	-.512	-1.845	.068
institution has in place a capacity building programme on ICT	-6.549	1.961	-.651	-3.339	.001

Source: (Author, 2021)

A Multiple regression analysis at α= .05 was used to examine the influence of Technological Factors on the performance of students in selected courses in TVET table 1.4; 1.5 and 1.6, represents the results of regression. The independent variable in the study was institutional based factors. The dependent variable was student performance. The null hypothesis was: H04: Institutional based factors about e-learning adoption have no significant influence on trainees' performance in the selected engineering programmes of TVET institutions in Kenya. Preliminary analysis was conducted to assess whether the assumption of multi collinearity, outliers, Normality, homoscedasticity and independent of residuals were met. The Model was not able to significantly predict Student drop out from schools. (F (4, 97) = 8.977, p >.000), with an R^2 of .319. The coefficient of determination R^2, which is the proportion of variance in the dependent variable (Student performance) that can be explained by the independent variables (Technological factors), that our independent variables explain 31.9% of the variability of the dependent variable (Student performance). My Institution is supportive to ICT use in teaching is measured on likert scale (1 = Strongly Agree, 2 = Agree, 3 = "Neutral" 4 = Disagree, 5 = Strongly Disagree). There is an Equipped computer laboratory in the institution is measured on likert scale (1 = Strongly Agree, 2 = Agree, 3 = "Neutral" 4 = Disagree, 5 = Strongly Disagree). There is Wi-Fi Connection in the

Institution is measured on likert scale (1 = Strongly Agree, 2 = Agree, 3 = "Neutral" 4 = Disagree, 5 = Strongly Disagree). The institution has Local internet connectivity is measured on likert scale (1 = Strongly Agree, 2 = Agree, 3 = "Neutral" 4 = Disagree, 5 = Strongly Disagree). Finally, the institution has ICT personnel is measured on likert scale (1 = Strongly Agree, 2 = Agree, 3 = "Neutral" 4 = Disagree, 5 = Strongly Disagree).
The analysis shows that Technological factors about e-learning in teaching in TVETS significantly predict student performance in selected Engineering courses. Therefore, the study reject the null hypothesis.

3.4 Ratio of Technical Staff to Trainees

From the findings, seventeen per cent (17%) of the respondents indicated that the ratio was one technical staff to ten students while fifty-five per cent (55%) indicated the ratio was one technical staff that was assigned to thirty students. Further to that, nine per cent (9%) indicated the ratio was one technical staff to fifty students. Nineteen per cent (19%) of the respondents indicated that they were not sure. This was shown in figure 4.11 in which the findings supported the fact that students needed assistance to compensate for the lack of experience and confidence in using technology. Additionally, not all students enrolled in the programme had the required skills to optimally use the e-learning resources offered at the beginning of their programmes. Therefore, the technical staffs were required to assist and guide the students at all times.

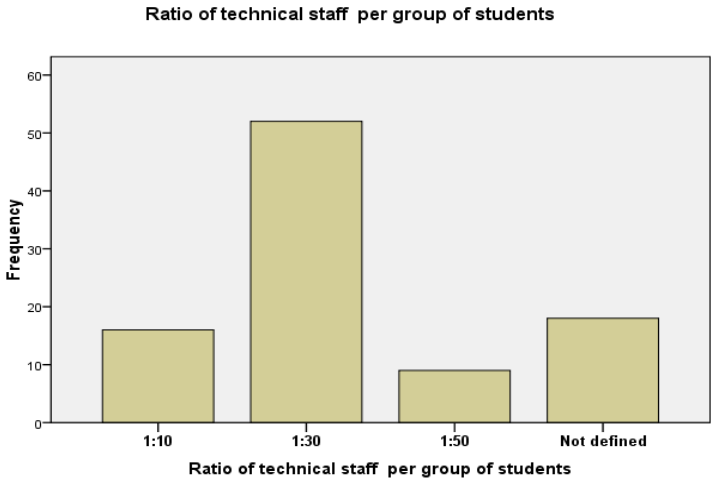

Figure 1.1: Ratio of Technical Staff to trainees

Source: (Author, 2017).

3.5 Enrollment and E-Learning

As regards increment in enrolment due to adoption of e-learning, sixty-seven per cent (67%) of the respondents indicated that the number of students increased by 1,000. Further to that twelve per cent (12%) of the respondents indicated that the increment was between 1,001 and 3,000. Eleven per cent (11%) of the respondents indicated that the increment was between 3,001 and 6,000 while another eleven per cent (11%) of the respondents also indicated an increase of between 6,001 and 10,000 as shown in figure 4.13. These findings indicated that TVET institutions were capable of increasing students' enrollment in their respective programmes which would be successfully be done by increasing access by using ICT technology. Such a situation would ensure that the potential students are facilitated regardless of their geographical location.

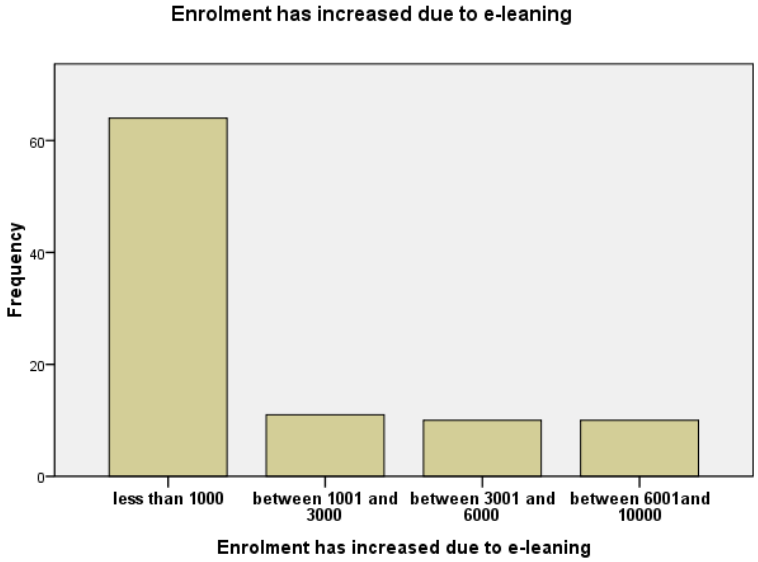

Figure 1.2 E-learning Enrollment

Source: (Author, 2021)

3.6 E-Learning and Off-Campus Interaction

As regards off-campus interaction, sixty one per cent (61%) of the respondents agreed that e-learning system allows off-campus interaction between students, while thirty nine per cent (39%) disagreed, as shown in figure 1.2. These findings were in line with those of (Damon, 1984 & Webb, 1989) who found that interaction does take place among learners outside the institution precincts. Further, interaction could be of learners in small groups or those who had a common goal. These interactions among learners had the advantage of encouraging learners to exchange ideas and learning experience and help leaners who were shy to talk in class or voice concern to their peers and trainers. Abrami, Bernard, Bures, Borokhovski & Tamim, (2011) identified three types of interactions that happen among learners: student–student, student-content and student-instructor interaction.

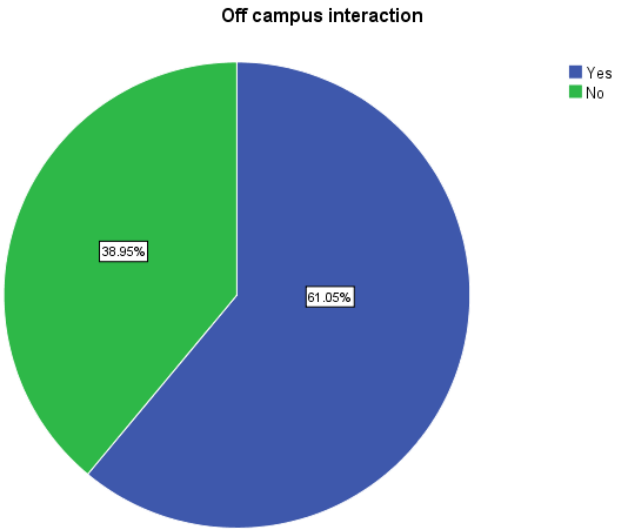

Figure 1.4: Off-Campus Interaction

Source: (Author, 2021)

IV. Recommendation

i) All TVET institution should constantly updated the technology in use for learning. This ensures needed ICT infrastructure, fast and reliable network are available at all times to the trainees and the trainers. Another recommendation is that the hiring of qualified technical staff, their training and retention policy should be formulated and implemented.

ii) TVET institutions management should offer their undivided support to the e-learning programs and facilitations. This support could be in terms of extensive training, workshops, policy development and awareness programs on LMS features, their usage and benefits to help increase the trainers' use of LMSs.

iii) Another recommendation is that trainers should be motivated so that they can embrace the technology. This will in return motivate trainers to support adoption of e-learning in terms of time and guidance of uploading of their material online for the trainees to access them.

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