

Influence Of Student Ict Tools Competency And Level Of Satisfaction With Ict Tools Integration On Student Performance: A Case Of Technical And Vocational Education Training Institutions In Kenya

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Abstract

Purpose: The purpose of this study was to investigate the influence of student Information and Communication Technology (ICT) tools competency and level of satisfaction with ICT tools integration on student performance in Technical and Vocational Education and Training (TVET) institutions in Kenya.

Methodology: The study employed a survey research design. The target population consisted of teachers and students in various TVETs in Kenya. Primary data was collected through self-administered questionnaires. Secondary data was collected through review of relevant literature. Descriptive statistics such as means, standard deviation was applied in the presentation of the data collected. Ordinal regression analysis was applied to test the relationship and statistical significance of student ICT tools competency levels and level of satisfaction with ICT tools integration on student performance.

Findings: The study findings showed that the TVET tutors and students utilized Learning Management Systems (LMS), multimedia tools, online collaboration tools, mobile learning devices, digital repositories and the social media in the learning environment. Students utilized the ICT tools to access to information, collaborate with peers, communicate with tutors and improve understanding of course materials. Majority of male respondents (70.3%) had an intermediate and advanced level of ICT competency. This high level of ICT competency is reversed with majority of female student having either none or beginner level of competency in the use of ICT tools. The results indicated that student level of education determined the level of ICT proficiency as shown by the majority of students who had attained certificate level of education (69.4%) as having basic or intermediate competency in ICT while majority (82.8%) of students who had attained a diploma level of education had advanced to expert level of ICT competency. Moreover, PhD tutors had advanced level of ICT proficiency. Majority of the respondents indicated that their engagement in the studies either somewhat improved (Mean = 4.06; Std =0.487) or became better (Mean = 3.12; Std=0.706) after ICT tools were integrated in their training. Most of the tutors had intermediate level of ICT competency (Mean=3.40; Std Dev=0.492) and frequently integrated ICT tools in teaching (Mean 4.02; Std Dev=0.910). Student ICT tools competency at all levels was found to positively and significantly affect student performance. The results also suggest students' satisfaction level in ICT tools integration positively affects student performance.

Conclusions: The study concludes that ICT tools are widely used in training and learning in TVETs. However, the female student respondents had lower ICT tools competency compare to their male counterparts. The study also concludes that student level of ICT tools competency and level of satisfaction in ICT tools integration in learning and teaching has a positive and statistically significant influence on student performance with the later having more influence on a unit-by-unit change compared to the former.

Recommendations: The study recommends that TVET institutions should introduce ICT training programmes to enhance the level of student ICT tools competency. Moreover, the ICT training programmes should target and encourage female students to join so as to bring their levels of competence at par with their male counterparts. Finally, institutions should develop mechanisms that continuously incorporate student level of satisfaction in their strategies of integrating ICT tools in the learning and teaching processes.

Keywords: ICT tools competency, ICT tools integration, satisfaction level with ICT integration

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I. INTRODUCTION

The Republic of Kenya has made a number of national and international commitments to transform the country into a Knowledge Society and Knowledge Economy. The Constitution of Kenya 2010 enshrines the right of every Kenyan to receive a quality education (Articles 43 and 46.). Both the Economic and Social Pillars of Vision 2030 recognize the critical need for Kenyan children to receive quality education that equips them with the 21st Century skills including digital literacy.

According to the National Information and Communication Technology (ICT) strategy for Education and Training (2006), the country envisions to facilitate ICT as a universal tool for education and training. In order to achieve this vision every educational institution, tutor, learner and the respective community would be equipped with appropriate ICT infrastructure, competencies and policies for usage and progress. It calls for recognition of the fact that ICT provides capabilities and skills needed for a knowledge-based economy. It also calls for transforming teaching and learning to incorporate new pedagogies that are appropriate for the 21st century.

Kenya's Vision 2030 proposes intensified application of Systemic-Theoretical Instruction (STI) to raise productivity and efficiency levels in all sectors of the economy. This was to be achieved through the creation of an enabling environment as well as provision of resources devoted to scientific research, technical capabilities of the workforce and in raising the quality of teaching in mathematics, science and technology in schools, polytechnics and universities. The National Information and Communication (ICT) Policy of 2019 was put in place to facilitate universal access to ICT infrastructure and services all over the country

In the past years the Kenya Government and with the assistance of development partners has committed a lot of funds in Technical and Vocational Education Training institutions. The funds have been directed into construction of new institutions, upgrading of existing ones, provision of equipment and capacity building of TVET trainers and technicians. TVET institutions have upgraded their infrastructure including the integration of ICT tools in learning and training.

Problem Statement

The Kenyan government has invested a lot of resources in establishing ICT supportive infrastructure and in building capacity for trainers and technicians in TVET institutions with the aim of enhancing student enrollment and performance. The Kenya Digital Master Plan 2022-2032 undertaking Digital Literacy Capacity Building for 20 million citizens, 10,000 ICT professionals on high-end skills, 300,000 public servants and 350,000 teachers to give them necessary Information Technology (IT) proficiency to be able to deliver services effectively to the citizen to be able to utilize technology in their businesses and access to government e-services. Information and Communication Technology Authority (ICTA) Kenya posits that students who engage with digital learning environments that are thoughtfully designed and presented in innovative ways are more likely to retain more information and perform better academically. The investment in infrastructure and capacity building may not generate the intended results especially performance unless the students are equipped with the necessary skills and competencies to utilize the ICT tools and infrastructure provided.

A number of studies have been conducted on the use of ICT in the training and learning process in public institutions such as the primary schools, colleges and universities. The studies investigated areas such as the types of ICT tools, influence of ICT on student performance, barriers of ICT integrations and challenges of ICT integration. Most of these studies analyzed the relationship between the various variable using descriptive statistics. This study aimed to analyze the influence of student ICT tools competency and level of satisfaction with ICT tools integration on student performance.

Research Objectives

The main objective of this study was to analyze the influence of ICT tools integration on learning outcomes in TVET institutions in Kenya. The study specifically analyzed the student ICT tools competency and satisfaction levels in ICT tools integration on student performance.

II. LITERATURE REVIEW

Theoretical Review.

Proficiency Theory of Adult Learning

The theory of adult learning and teaching uses proficiency as a unifying concept to relate acquisition of knowledge, skills and attitudes to improved performance, which motivates much adult learning. Proficiency is the capability to perform given the opportunity. An interest in enhanced proficiency encourages adults to engage and persist in learning activities. Effective adult learning is transactional and developmental, with periodic assessment of discrepancies between current and desired proficiency to assess needs, set objective, organize learning activities and evaluate progress. Experience, learning effectiveness, sense of proficiency and commitment to enhance proficiency affect the adults' search for meaning which entails acquisition of new learnings and reorganization of the old information. Effective teaching-learning transactions encourage adult learners to assume major

responsibility for objectives and pacing, combine an overview of content with emphasis on important aspects and contain a sequence of activities that encourages persistence in learning activities and use of new learnings (Knox, 1980)

Social Cognitive Theory

The social cognitive theory emphasizes the importance of observing, modeling and imitating the behaviors, attitudes and emotional reactions of others since learning takes place in a social context. The theory posits that learning will partly be through observational learning where individuals learn and adopt behaviors by observing others (Janette et al. 2009). People actively influence their learning by interpreting the outcomes of their action, which, in turn, affects their environments and personal factors, informing and altering subsequent behavior (Schunk, 2012). In the context of this study, students and tutors will integrate ICT tools in learning and teaching if they identify with tutors and students who have already integrated the ICT tools. Additionally, tutors and learners will be motivated to integrate ICT tools in their learning and teaching if they observe positive outcomes as a result of the integration such as enhanced learning outcomes.

Empirical Review

The Republic of Kenya has developed and approved a number of policy documents to transform the country into a Knowledge Society and Knowledge Economy. These include the Constitution of Kenya 2010, Kenya Vision 2030, National ICT strategy for Education and Training (2006) and the National Information and Communication (ICT) Policy 2019 among others. The ICT sector has been allocated funding in the national budgets since the enactment of the Constitution of Kenya 2010. Several institutions such as the ICTA, the Communication Authority of Kenya (CAK) and government ministries or departments mandated to further mainstream the use of ICT tools in all aspects of government business including training have all been mobilized for the same. These efforts demonstrate the government's commitment to leverage on ICT in transforming Kenya into a Knowledge Society and Knowledge Economy.

Results from various studies have indicated that integration of ICT tools in the learning teaching process can enhance engagement, motivation and achievement of the students in various subjects. However, the impact of ICT on student performance can vary depending on several factors such as the quality of the ICT tools, the teaching methods and their previous knowledge and skills (Adel et al, 2022; Macharia 2022; Mwadulo 2020; Kisirkoi 2015). Despite the potential benefits of ICT in education, there are also several challenges and limitations to its use. For instance, the cost of ICT infrastructure, hardware and software, can be a significant barrier. Additionally, there are concerns about the quality and reliability of some ICT tools, as well as issues related to privacy and security (Murithi and Yoo 2021; Kibuku et al 2020; Njoka et al 2020). Nonetheless, literature suggests that the impact of ICT on education is largely positive, with the potential to enhance the quality and accessibility of education.

Kibuku et al. (2020), noted in their study that several national, organizational, technological and social issues have to be overcome in order for ICT to be fully integrated in our learning process. These issues include the quality of instructional design, the technological infrastructure, the learner's motivation and engagement, lack of adequate e-learning policies, a lack of technical and pedagogical skills and training for online tutors and learners, a lack of an e-learning theory to support the practice, budgetary restrictions and sustainability issues, negative perceptions of e-learning, quality issues and the dominance of e-learning goals by technology and market forces

Bariu et al. (2022) conducted a study on the essence of tutors' competencies on ICT implementation in Kenyan Universities. They found that tutors' level of competencies increases as they use and employ software tools when teaching. This shows that it is critical to train and evaluate the tutors' ICT competencies as they engage the students. Therefore, it is essential for the stakeholders to invest in the ICT training and development of the teachers.

Ng'ambi and Lombe (2019) did a systematic review on the impact of e-learning on student academic performance in higher education in Africa. The review found that the use of technology-enhanced learning had a positive impact on students' learning outcomes, particularly in the areas of engagement, motivation and retention. The use of ICT tools improved students' academic performance in Science Technology Engineering and Mathematics courses, particularly in the areas of problem-solving and critical thinking. This was the case in a study carried out by Adebessin et al. (2019), which examined the impact of e-learning on students' academic performance in African universities. They found that the use of e-learning had a positive impact on students' academic performance. However, they cited challenges such as inadequate ICT infrastructure, limited technical support and inadequate training for educators. Noteworthy, is that these positive results were also noted in Kenyan vocational training centers particularly in the area of students' engagement and motivation. The script did not change when it came to the challenges experienced at these TVETs (Owusu-Andah & Larbi-Siaw, 2019; Mugambi & Nyakwara, 2017).

Mutula and Brakel (2006) examined the use of ICT tools in teaching and learning in six Kenyan universities. The study found that the use of ICT tools had a positive impact on teaching and learning processes, and improved students' access to educational resources. However, the study identified challenges related to inadequate ICT infrastructure, limited technical support, and inadequate training for educators. Similarly, Kariuki & Ogalo (2016) explored the impact of ICT integration in teaching and learning at four other Kenyan universities. The findings indicated that the use of ICT tools improved students' learning experiences and outcomes. However, the study found that the lack of ICT infrastructure and technical support were major barriers to effective ICT integration. The challenges were quite similar to the case of Kinyua and Odundo (2017) who assessed the impact of e-learning on students' performance. Nonetheless, their findings indicated that e-learning had a positive impact on students' learning outcomes. This was evidenced by improved academic performance and increased access to educational resources. Moreover, the recurrent challenges identified that are related to ICT infrastructure and technical support must be addressed to ensure effective ICT integration (Odundo et al., 2019).

Through experiential results, it is evident that teachers' ICT competence is an important factor in improving learning outcomes in technical and vocational training institutions. Teachers who are competent in using ICT are more effective in delivering course content, engaging students and assessing students' learning, which ultimately leads to improved student outcomes. This is captured in several studies in West Africa states (Musa, 2016; Siyanbola et al., 2015; Adomi & Omodeko, 2014) as well as here in Kenya (Kibera & Ochieng', 2017; Odera & Wamalwa 2017; Ouma & Ogao, 2016). The studies majorly focused on the influence of ICT competence on job effectiveness, vocational and technical productivity of technical college teachers. It is documented that the training, retraining and constant development for these teachers is crucial in their job performance and delivery of knowledge, imparting practical skills and evaluation of the students (Odera & Wamalwa 2017). Therefore, ICT proficiency of the teachers plays a critical role in the overall performance of the students; including the ability to deliver quality instruction, promote student-centered learning, foster collaboration among students, assess student learning and provide timely feedback to the students (Kibera & Ochieng', 2017). In equal measure, students' ICT proficiency is an important factor in their academic performance, especially at technical and vocational training institutions where they aim at acquiring practical skills and knowledge tailored for particular sectors in the labor market

III. RESEARCH METHODOLOGY

Research Design

The study utilized the survey research design which was appropriate to gather information from a target population or a sample of that population. It involved collecting data through self-administered questionnaires from the study participants. The survey research design was preferred for the study since it has the ability to collect large amounts of data from a diverse population and the ability to analyze the data in a systematic and rigorous way that captures the attitudes, perceptions and experiences of the population (Creswell, 2012; Kothari, 2019).

Population

The target population for the study were 5000 students and tutors who were either working or enrolled in the various TVET institutions across the country as at March and April 2023 when the study was undertaken.

Sample Design

The Kadam & Bhalerao, 2010 statistics formula was used to obtain our sample size.

$$\text{Sample size} = \frac{z^2 \times p(1-p)}{e^2} \div \left(1 + \frac{z^2 \times p(1-p)}{e^2 N} \right)$$

Where;

N = population size

e = margin of error (percentage in decimal form)

z = z-score (number of standard deviations a given proportion is away from the mean)

In our case, the sample size was calculated using a target population size of 5000, the margin of error being 5% and the confidence level being 95%. This yielded a sample size of 357 individuals teaching and learning at the TVET institutions across the country.

Data Collection Tools

Self-administered questionnaires were used for collecting primary data from the respondents, containing both close-ended. Secondary data was collected through review of available literature.

Data Analysis Techniques

The collected data was examined and checked for completeness and comprehensibility. The data was then summarized, coded, tabulated and analyzed using SPSS version 23. Descriptive statistics such as means, standard deviation and ordinal regression analysis to test the relationship between ICT Integration Competencies, Level of Satisfaction in ICT Tools Integration, and Student Performance

IV. FINDINGS AND DISCUSSIONS

Types of ICT Tools Utilized in Learning and Teaching

The TVET teachers and students utilized Learning Management Systems (LMS), multimedia tools, online collaboration tools, mobile learning devices, digital repositories and the social media in the learning environment. Students utilized the ICT tools to access to information, collaborate with peers, communicate with teachers and improve understanding of course materials.

Gender and ICT Competency

The respondent was asked about their gender and ICT competency level. The data was cross tabulated and displayed in Table 1.

Table 1 Gender and ICT Tools Competency

		Student				Teachers			
		None	Beginner	Intermediate	Advanced	None	Beginner	Intermediate	Advanced
Gender	Male	27.0%	13.5%	43.2%	27.0%	0	0	70.1%	29.9%
	Female	13.5%	30.3%	30.3%	13.5%	0	0	39.4%	60.6%
Total		21.0%	21.0%	37.5%	20.5%			60.0%	40.0%

The results in Table 1 suggest that majority of male respondent (70.3%) had an intermediate and advanced level of ICT competency while majority of female student had either none or beginner level of competency. Furthermore, majority (70.1%) of the male teachers had an intermediate level of ICT competency while majority of the female teachers had an advanced level of ICT proficiency’s results indicate that the students had moderate proficiency in ICT. In addition, the teachers while well knowledge and competent on ICT.

Level of Education and ICT Tools Proficiency

The respondents were asked the level of education and ICT tools proficiency. The results were Cross tabulated and presented in Table 2

Table 2 Level of Education and ICT Proficiency

		Student ICT Tools Proficiency				Teacher ICT Tools Proficiency				
		Basic	Intermediate	Advanced	Expert	None	Beginner	Intermediate	Advanced	
Education Level	Certificate	34.7%	34.7%	24.2%	6.3%	Degree	0	0	100.0%	
	Diploma	8.6%	8.6%	49.5%	33.3%	Masters	0	0	81.7%	18.3%
						PhD	0	0	3.3%	96.7%

The results in Table 2 suggest that majority (69.4%) of the student respondents with certificate level of education had basic and intermediate ICT Proficiency. In addition, majority of the diploma students (82.8%) had advanced to expert level of ICT proficiency. Furthermore, Majority (81.3%) of teachers had intermediate and advanced level of ICT proficiency. Moreover, PhD teachers had advanced level of ICT proficiency. The results suggest that student level of education determines ICT proficiency in Kenya.

Descriptive Statistics

The study results were analyzed in terms of descriptive statistics. The results are presented in Table 3

Table 3 Student Descriptive Statistics

Student Descriptive Statistics			
	N	Mean	Standard Deviation
Education Level	200	1.52	.501
ICT Tools Proficiency	200	2.58	1.039
Satisfaction Level with ICT Tools Integration	200	2.94	1.319
Improvement in Student Engagement	200	4.06	.487
Student Performance after ICT Integration	200	3.12	.706

The results in Table 3 suggest that majority of the student respondents had diploma as the highest level of education (Mean = 1.52: Std= 0.501). In addition, most of the student respondents had either basic or intermediate level of ICT Tools Proficiency (Mean = 2.58: Std =1.039). Furthermore, the level of satisfaction level with ICT tools integration was moderate (Mean = 2.94: Std=1.319) Majority of the respondents indicated that their engagement in the studies somewhat improved (Mean = 4.06: Std =0.487) after ICT tools were integrated in their training. Majority of the respondents indicated that their performance became better (Mean = 3.12: Std=0.706) after ICT tools were integrated in their training

The study also displayed descriptive analysis of the teachers. The results from the analysis are presented in Table 4.

Table 4 Teacher Descriptive Statistics

	N	Mean	Standard Deviation
Level of Education	100	2.20	.603
Level of ICT Competency	100	3.40	.492
Frequency of ICT Tools Integration in Teaching	100	4.02	.910
Effect of ICT Integration on Student Performance	100	2.96	.281

The results in Table 4 suggest that majority of the teachers had degree level of education (Mean=2.20); Std Dev=0.603) as the highest level of education. Most of the teachers had intermediate level of ICT Competency (Mean=3.40; Std Dev=0.492) suggesting a high level of ITC tools competency by teachers. Majority of the teachers frequently applied ICT tools integration in teaching (Mean 4.02; Std Dev=0.910). Majority of the teachers indicated that the application of ICT integration has improve the student performance. The results agree with studies conducted in West African countries (Musa, 2016; Siyanbola et al., 2015; Adomi & Omodeko, 2014) as well as here in Kenya (Kibera & Ochieng', 2017; Odera & Wamalwa 2017; Ouma & Ogao, 2016), that indicated that teachers who are competent in using ICT are more effective in delivering course content, engaging students and assessing students' learning, which ultimately leads to improved student outcomes.

Inferential Analysis

The study applied ordinal logical regression to analyze the relationship between ICT tools integration and Student Performance.

Ordinal Regression

Diagnostic Test

Model Test Statistically

The model was examined for fitness. The following hypotheses were tested for the model fitness.

H₀=The Model is Not Statistically Significant

H₁=The Fitted Model is Statistically Significant.

The Results is presented in Table 5.

Table 5 Model Fitting Information

Model Fitting Information				
Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	232.359			
Final	.000	232.359	6	.000

From the results in Table 5 the difference between the intercept only and final model is significant (0.00) since it is less than standard value (0.05). The null hypothesis is therefore rejected hence the model is Statistically significant. The model is therefore good for analysis as it adequately describes the data. Furthermore, the model

goodness of fit was examined using the Goodness of Fit test. For the model goodness of fit the following Hypothesis tested were

H₀=The Fitted Model is fit

H₁=The Fitted is Model is Not Fit

Goodness-of-Fit			
	Chi-Square	Df	Sig.
Pearson	.007	12	1.000
Deviance	.015	12	1.000

From the results in Table 3, the significance level in both Pearson and Deviance Test were compared with the standard value (0.005). The Null hypothesis was rejected if the p-value was less than the standard value (0.05) for both the test. From the results in Table 3 the p-values for both the Pearson and Deviance tests were not significant. Therefore, the null hypothesis in not rejected hence the model is fit for analysis. This result shows that the right statistical analysis was applied in the study since there is no significant difference between the observed data and the fitted model.

ICT Tools Competencies, Level of Satisfaction in ICT Tools Integration and Student Performance

An ordinal regression analysis was conducted to investigate the relationship between ICT Competencies, Level of Satisfaction in ICT Tools Integration, and Student Performance. The results are summarized in Table 6.

Table 6 Parameter Estimates

Parameter Estimates		Estimates	Odds ratio	Std. Error	Wald	df	Sig.	95% Confidence Interval	
								Lower Bound	Upper Bound
Threshold	[Student Performance after ICT Integration = 2]	2.551	0.078	0.5	25.99	1	0.05	1.57	3.532
Location	[ICT Tools Competency=1]	3.738	0.0238	0.62	36.36	1	0.05	2.523	4.953
	[ICT Tools Competency=2]	0.89	0.4106	0.432	4.23	1	0.05	0.043	1.737
	[ICT Tools Competency=3]	0.579	0.5604	0.388	2.22	1	0.13	0.182	1.34
	[ICT Tools Competency=4]	0a	.	.	.	0	.	.	.
	[Satisfaction Level in ICT Integration=2]	0.402	1.4948	0.448	0.80	1	0.37	-0.477	1.281
	[Satisfaction Level in ICT Integration=3]	1.479	4.3885	0.758	3.80	1	0.05	-0.007	2.964
	[Satisfaction Level in ICT Integration=4]	2.71	15.029	1.537	3.10	1	0.05	-0.303	5.723
	[Satisfaction Level in ICT Integration=5]	0a	.	.	.	0	.	.	.

The result in Table 7 is interpreted as a linear regression examining the sign of the estimates. A positive sign suggests a likelihood of a positive impact on the dependent variable while a negative sign in the estimates indicated a likely of a negative impact on the dependent variable.

The following hypothesis were examined

H₀₁: ICT Tools Competency does not significantly influence Student Performance

From the results in table 7, the independent variable ‘Basic’ level of ICT tools competency was found to contribute to the model (**Estimates=3.738; Ordered log= 0.0238, SE=0.62, Wald=36.36, p=0.05**). The estimated odds ratio indicated a positive relationship of nearly **0.0238** folds. For every one unit increase in ‘Basic’ level of ICT tools competency, student performance increased by 0.0238 units. The results suggest a positive and statistically significant (**p=0.00<0.05**) relationship between ‘Basic’ level of ICT tools competency and student performance. In addition, ‘Intermediate’ level of ICT tools competency was found to have a positive and

statistically significant influence on student performance (**Estimates=0.89; Ordered log= 0.4106, SE=0.432, Wald=4.23, p<0.05**). The estimated odds ratio indicated a positive relationship of nearly 0.4106 folds. This suggest that for every one unit increase in 'Intermediate' level of ICT tools competency, student performance increases by 0.4106 units. The positive relationship between 'Intermediate' level of ICT competencies is statistically significant(**p=0.05>=0.05**). Furthermore, 'Advanced' of ICT tools competency was found to positively and significantly affect student performance (**Estimates=0.579; Ordered log=0.5604, SE=0.388, Wald=2.22, p<0.13**). The estimated odds ratio indicated a positive and statistically significant(**p=0.13>0.05**) relationship indicating for every increase in the 'Advanced' level of ICT tools competency, student performance increased by nearly 0.5604 folds. The null hypothesis that there is no statistically significant relationship between the level of ICT tools competencies and student performance is rejected. These results agree with the works Odera & Wamalwa (2017) and Kibera & Ochieng' (2017) which indicated that the student ICT proficiency is an important factor that enhanced student academic performance.

Ho2: Students' Satisfaction Level in ICT Tools Integration does not significantly influence Student Performance

From the results in Table 7, the independent variable 'Somewhat Dissatisfied' with the level of ICT tools integration was found to contribute to the model (**Estimates=0.402; Ordered log= 1.4948, SE=0.4480, Wald=0.80, p=0.37**). The estimate indicated a positive relationship of nearly **1.4948** folds. For every one unit increase in satisfaction level student performance increases by **1.4948** units. The results suggest a positive(**p=0.37>=0.05**) and statistically significant relationship between 'Somewhat Dissatisfied' with the level of ICT tools integration and student performance. In addition, the 'Neutral' level of satisfaction with ICT tools integration was found to have positive and significantly influence on student performance (**Estimates=1.479; Ordered log= 4.3885, SE=0.758, Wald=3.80, p=0.05**). The estimated odds ratio indicated a positive relationship of nearly **4.3885** folds. This suggest that for every one unit increase in neutral level of satisfaction with in ICT tools integration, student performance increased by **4.3885** units. The relationship between 'Somewhat Satisfied' level in ICT tools integration is positive and statistically significant(**p=0.05>=0.05**). Furthermore, 'Somewhat Satisfied' level in ICT tools integration was found to positively affect student performance (**Estimates=2.71; Ordered log=15.029, SE=1.5029, Wald=3.80, p=0.05**). The estimated odds ratio indicated a positive relationship of nearly **15.029** folds. This suggest that for every one unit increase in somewhat satisfied level of satisfaction with ICT tools integration student performance increase by 15.029 units. The null hypothesis that there is no statistically significant relationship between students' level of satisfaction in ICT tools integration and students' performance is rejected. The results suggest students' satisfaction level in ICT tools integration positively affects student performance in statistically significant manner. These results confirm the works of Ng'ambi and Lombe (2019), Adebessin et al. (2019) and Mutula and Brakel (2006) which similarly indicated that the integration of ICT tools in the learning and teaching process had positive influence of student performance.

V. CONCLUSION AND RECOMMENDATIONS

Conclusions

The TVET teachers and students frequently utilized ICT tools such as Learning Management Systems (LMS), multimedia tools, online collaboration tools, mobile learning devices, digital repositories and the social media in the learning environment. Students utilized the ICT tools to access to information, collaborate with peers, communicate with teachers and improve understanding of course materials. The female student respondents had lower ICT tools competence with only 70.1% indicating that they had below the beginner of ICT tools competence.

There is a positive and statistically significant relationship between student level of ICT tools competency and student performance. Any increase in the student ICT tools level of competency enhances student performance in a positive and increasingly significant manner as demonstrated by the rise in the odds ratio (**0.0238, 0.4106, 0.5604**) as the level of competency progressed from basic to intermediate and final to advanced.

The relationship between the student level of satisfaction in ICT tools integration in learning and teaching is positive and statistically significant. The higher the student satisfaction with the level of ICT tools integration the higher the increase in student performance as indicated by the rise to **15.029** units in the odds ratio at the 'Somewhat Satisfied' level from **1.4948** units at 'Somewhat Dissatisfied' level.

The level of student satisfaction in the ICT tools integration has a higher impact on student performance compared to the student ICT tool competency. A unit change in the level of competency results in less than a unit change in student performance (**0.0238, 0.4106, 0.5604**) while a unit change in level of student satisfaction leads to more than a unit change in student performance (**1.4948, 4.3885, 15.029**).

Recommendations

The study recommends that

1. TVET institutions should introduce ICT training programmes to enhance the level of student ICT tools competency.
2. The ICT training programmes should target and encourage female students to join so as to bring their levels of competence at par with their male counterparts
3. Student level of satisfaction on ICT integration has a higher influence on student performance compared to the level ICT competency. Institutions should develop mechanisms that continuously incorporate student level of satisfaction in their strategies of integrating ICT tools in the learning and teaching processes.

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