

Impact of Workshop Utilization on Trainees Skill Acquisition in Engineering Courses in TVET Institutes- Lake Victoria Region, Kenya.

Dorcas A. Ojera

Rongo University, School of education

Enose M.W Simatwa

Tom Mboya University College, School of Education

Maurice A. Ndolo

Tom Mboya University College, School of Education

Abstract

Engineering courses prepare students with skills that promote self-employment. Despite the importance of engineering, student performance in Kenya National Examinations Council (KNEC) examinations has been below expectations. The objective of this publication was establishing impact of physical facilities on trainees skill acquisition in engineering courses in TVET institutes in Lake Victoria Region, Kenya. This publication was anchored on the Dekeyser's Skill Acquisition Theory of 2007. The research design used was Concurrent Triangulation. The population used was 5 principals, 56 trainers, 20 heads of department, and 828 trainees taking engineering courses in selected TVET Institutes. The sample size constituted 5 principals, 8 heads of departments, 16 trainers, and 251 trainees. However only 218 (88.21 percent) trainees out of 251 returned questionnaires. Instruments for data collection were questionnaires and interview schedules. Reliability of the instruments was established using test re-test method whereby an acceptable coefficient of 0.70 was achieved. Quantitative data collected using questionnaires was analyzed using means, frequencies, and percentages. Regression analysis was used to ascertain the impact of Principals' leadership factors. Qualitative data were analyzed by themes and sub-themes as they emerge from the interviews and document analysis. The publication's findings showed that in TVET institutions there is a statistically significant impact of physical facilities on trainees' skill acquisition in engineering courses in TVET institutes in Lake Victoria Region, Kenya. In summary, the publication variables had a positive impact on trainee skill acquisition. This conclusion supports the view that physical facilities are crucial for skill acquisition.

Keywords: skill acquisition, leadership, policy, Academic Achievement, Education and secondary Schools.

Date of Submission: 17-06-2021

Date of Acceptance: 02-07-2021

I. INTRODUCTION

The objective of the publication was to establish the extent to which workshop utilization impacts student skill acquisition in diploma-level engineering courses at TVET institutes. To address this objective, workshop utilization was investigated using descriptive statistics, while inferential statistics were used to establish the relationship between workshop utilization and student skill acquisition in TVET institutions.

II. LITERATURE REVIEW

Technical Vocational Education (TVE) is defined by Audu and Musta'amal (2013) as 'that aspect of education which leads to the acquisition of practical and applied skills that will enable its recipients to secure employment in a particular occupation.' They go on to state that these technical skills cannot be acquired in a vacuum but rather in a well-established and functional workshop with the right tools, equipment, and machines for effective implementation of the program (Audu & Musta'amal, 2013).

In Southern New Jersey, Turano (2005) found that the performance of students decreased whenever classrooms were minimal. The study discussed the learning process of students and how it is affected by the physical environment, noting that the classroom environment just like instructional management and teaching efficiency affected students' learning process. Suleiman and Hussain (2014) put more emphasis on a creative physical arrangement of the classroom noting that this would facilitate delivery of instruction as well as enhance the learning process.

A study by Ambogo (2012) supports the above point of view and states that a good learning environment is one in which sufficient coherence is made between the supply and distribution of resources, buildings, and equipment. A study by Akomolafe and Adesua (2016) in West Nigeria on the influence of physical facilities (workshops) affected levels of motivation and academic performance of students in senior secondary schools found that there is a significant relationship between physical facilities and the level of student's motivation and academic performance. The study recommended an increase of fund and budgetary allocations towards making physical facilities in institutions more learner-friendly, noting that a school's physical facilities can motivate students towards learning. Oduyemi (2000) classified physical facilities within learning institutions into two groups; permanent and semi-permanent structures. The study went further to give examples of physical facilities as laboratory equipment, teacher tools, and teaching aids among others. Both studies noted that physical facilities are likely to motivate students towards learning.

Another study conducted by Onyene (2007) in Nigeria, found that the training of skill-oriented graduates for the labor market was severely limited by available physical and material resources used in teaching at technical institutions. Another researcher, still in Nigeria Ayua (2006) in a study on consolidating and sustaining the industrial performance of school product in technical vocational training institutes aimed for national development unveiled that the availability of teaching equipment and material resources was wanting as there were no standard workshops with adequate facilities.

A look at other studies in Nigeria revealed as follows, Audu (2013) affirmed that TVET educators decry the poor state of workshops and workshop equipment within TVET institutions in the country. Umar and Maaji (2010) noted that the majority of TVET institutions in Nigeria are performing below expectation due to inadequate workshop facilities, which pose a challenge to skill acquisition by TVET students. The study emphasized that adequate workshop facilities are necessary and key to the implementation of the TVET curriculum. Udofia et.al. (2012) supported this finding stating that the availability of workshop facilities significantly impacted the acquisition of skills by students. Chukwumaijem (2015) in a study on the quality of TVET programs and improvement strategies noted that the challenge facing quality skill acquisition within TVET institutions was poor funding and inadequate facilities. Alimi. et.al (2012) facilities within learning institutions were the main factor in boosting student academic achievements. The study listed classrooms, libraries, recreational equipment, and other school buildings as examples of facilities. This study is backed up by Akomolafe and Adesua (2016) which indicated that students had more interest in learning and performed better in those institutions with good physical facilities.

In Nigeria, Audu (2013) gives evidence that one of the problems of great disagreement among TVET lecturers is the issue of the inadequate and poor state of workshop tools and equipment in TVET colleges. Umar &Ma'aji (2010) in their article said that most of the TVET colleges in Nigeria have been forced to perform below-set standards due to non-availability of workshop tools and equipment, poor leadership in the governance structure, or complete neglect of the needed facilities in the laboratories for the students to acquire effective skills needed for employment on the industries. Therefore, availing of enough workshop tools, equipment and machines are paramount for the effective execution of TVET courses in any nation Kenya included. Udofia et.al.(2012) agrees with Umar &Ma'aji (2010) by stating that there is a substantial linkage between workshop equipment for training and attainment of employable skills. According to the research done by Dasmani (2011), TVET colleges operating in Ghana suffer from a lack of provision of instructional requirements and training equipment which leads to centering more on theoretical lectures leading to trainees lacking expertise in their selected field of specialization. Since TVET colleges rely mostly on training and skill acquisition, the short supply of needed facilities, materials, and equipment will have a profound negative effect on practical skills acquisition. In Kenya Muthaet.al., (2012) noted that most of the TVET institutions operate without adequate workshop facilities and requirements, which do not have adequate training equipment. The lack of training facilities compromises the relevance of taught skills to market skills needed in the employment industries and firms organizations. Most of the training equipment found in TVET colleges is not technologically in correlation with equipment found in industries and business setups. The training facilities are inferior or outdated with the equipment employed in industries and corporate organizations. The state of training facilities wears down the relevance of acquired skills to the market skill needed in the employment market. There is an imperative need to bring to date equipment and provide enough equipment to enable that students graduating out of TVET institution have the skills required to be employed. The market skill needs in industries and business organizations should be similar to the skill learned in TVET colleges. In tandem with this, the TVET policy in Kenya agrees that one challenge facing TVET institution in their curriculum execution is out of date training equipment that results in poor quality in skills acquisition and training skills leading to irrelevant skills among graduates that cannot add value to the business organizations they are seeking employment (Nyerere, 2009).

III. METHODOLOGY

This section presents research method used, sampling process, data collection and ethical considerations that was considered in this research

Research method

The study utilized a concurrent triangulation research design (Mixed methods). The triangulation research design was selected since it offers the chance to inject both quantitative and qualitative data as a means to recreate a research outcome to find a solution to the relevant issues in a study. Also, Concurrent triangulation research design offered an exceptional means of data collection for this study on Impact of Principals' Instructional Leadership Practices on Trainees' Skill Acquisition in Engineering Courses in TVET Institutes-Lake Victoria Region, Kenya. Concurrent triangulation research design gave a pathway to collect both quantitative and qualitative data for data analysis. This view was advanced by Rothbauer and Paullette, (2008)

Sampling

The study adopted stratified sampling, where the student trainee population was divided into four engineering departments (Automotive engineering student, Civil engineering students, Mechanical engineering students, and Electrical & Electronic Engineering students) per TVET institutes. The students per department were individually more homogeneous than the total student trainee population. Stratified sampling was used because it is an acceptable way of sampling when there is an imbalance in the characteristics of the sample (Creswell, 2014). The trainees were selected proportionately, in line with the recommendation by Orodho (2009),

Data collection

The instruments used in this study were the questionnaire and interview schedule. The questionnaire guarantees confidentiality Koul (2004) while interview schedules are flexible and can verify the information in the questionnaire. In-depth interviews are one of the methods used in descriptive designs to act as follow-up instruments for gathering more data (Kothari, 2004). There was the use of an interview schedule for principals, a questionnaire for students and trainers, and workshop technicians.

The study employed both primary and secondary data collection procedures. Primary data was collected using face-to-face interviews with the school principals. Further, self-administered questionnaires were used to collect data from the trainers and students. Questionnaires were used because they can help gather data in a short period and at minimum expense Unlike interviews, questionnaires can be administered to a large number of respondents in different geographic locations in a short time yet guarantee high response rates with a diversity of information. Secondary data were found in document analysis to check on the entry grades of engineering trainees as permitted by institutions.

IV. DATA ANALYSIS

From the views of the student trainees, the study sought to summarize the frequency of the mean ratings on utilization of engineering workshops by the trainees among the TVET institutions within the Lake Victoria Region, as summarized in Table 1.

Table 1: Summary of Mean Ratings on Utilization of Engineering Workshops by the Trainees among the TVET institutions

Utilization of Engineering Workshops by the Trainees among the TVET institutions				
	Ratings	Interpretation	F	Percentage
Ratings	1.00-1.44	Very Inadequate	12	5.5
	1.45-2.44	Inadequate	73	33.5
	2.45-3.44	Moderately Adequate	65	29.8
	3.45-4.44	Highly Adequate	58	26.6
	4.45-5.00	Very Highly Adequate	10	4.6
	Total		218	100.0

Key: 1-Very Inadequate; 2-Inadequate; 3-Somehow Adequate; 4-Adequate and 5-Very Adequate Interpretation of mean rating: 1.00-1.44 (Very Inadequate), 1.45-2.44 (Inadequate), 2.45-3.44 (Moderately Adequate), 3.45-4.44 (Highly Adequate) and 4.45-5.00 (Very Highly Adequate)

Source: Survey data (2021)

From Table 1, it is unmistakably evident that utilization of engineering workshops by the trainees among the TVET institutions was generally moderate as rated by the student trainees. For example, on a scale of 1 to 5, 85 (39.0 percent) of the student trainees rated their utilization of engineering workshops in their institute as either inadequate or very inadequate. Nearly three out of every ten 51 (23.4 percent) of the trainee respondents held that utilization of engineering workshops by the trainees was moderate. Only 68 (31.2 percent) of the sampled student trainees rated utilization of engineering workshops as either highly adequate or adequate. To ascertain whether workshops had any significant impact on skill acquisition, a regression analysis was conducted.

Table 4 Regression Coefficients- Impact of Workshop Utilization and TVET Trainees' Skills Acquisition
Impact of Workshop Utilization and TVET Trainees' Skills Acquisition

Model	Regression Coefficients						
	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0 percent Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	3.71	.946		3.921	.00	1.845	5.576
Workshops' Utilization	.601	.335	.121	1.793	.074	-.060	1.263

a. Dependent Variable: Trainees' Skill Acquisition

$Y = \alpha + \beta X_3 + \varepsilon$, where $Y =$ Skills Acquisition; $X_3 =$ Workshop Utilization and ε is the error term

$Y = 3.711 + 0.601X_3 + \varepsilon$

Source: Survey Data 2021

From the analysis, the unstandardized coefficient of 0.601 was not statistically significant ($t = 2.494$; $p = .013$). This suggests that with a 95 percent confidence there is no certainty the coefficient parameter would be contained within an interval of (-.060, 1.263), the interval contains zero. Hence, there was not sufficient evidence to reject the null hypothesis that “*there is no statistically significant Impact of workshop utilization on TVET trainees' skills acquisition*”. As a result, the null hypothesis was supported and it was concluded that although there are some positive impacts of workshop utilization on TVET trainees' skills acquisition, it is not statistically significant. The implication of this is that improving the provision of workshop utilization by one unit may not cause a significant improvement in the level of skills acquisition among the TVET trainees.

The researcher noted that workshops played a very crucial role in skill acquisition. This research supports that workshops should be made functional to improve skill acquisition.. Since they are important for skill acquisitions, stakeholders must put measures in place to create an enabling environment for skill acquisition in TVET institutions.

The analysis supports Ambogo (2012) who states that a good learning environment is one in which sufficient coherence is made between the supply and distribution of resources, buildings, and equipment.

Also, this result agrees with Udofia et.al. (2012) who stated that the availability of workshop facilities significantly impacted the acquisition of skills by students. Chukwumaijem (2015) in a study on the quality of TVET programs and improvement strategies noted that the challenge facing quality skill acquisition within TVET institutions was poor funding and inadequate facilities. Alimi. et.al (2012) facilities within learning institutions were the main factor in boosting student academic achievements. The study listed classrooms, libraries, recreational equipment, and other school buildings as examples of facilities. This study backs up by Akomolafe and Adesua (2016) which indicated that students had more interest in learning and performed better in those institutions with good physical facilities.

V. DISCUSSION

The results of the study revealed that there is generally low equipment/tools to students' ratios in many of the TVET institutions within the Lake Victoria Region. This was confirmed by a low rating of 2.39, with a majority of 127 translating to 57.3 percent of the trainees who participated in the survey confirming that the ratio of equipment/tools to students in their department is quite inadequate. Worse still, it emerged that the many engineering equipment's in some of the TVET institutions are in a state of despair. This was reflected by a mean rating of 2.96, with only 74 (34.0 percent) of the trainees alluding that most of the engineering equipment in their departments are well-maintained and are in up-to-date status, while the majority of the trainees accepting that the equipment in the department are in bad status or are outdated. Likewise, whereas only 73 (33.5 percent)

of trainees indicated that their engineering machinery is in a good state, 96 (44.1 percent) of them held that the engineering machinery in their departments are in a poor state and not adequate to facilitate effective skills acquisition, as mirrored by a mean rating of 2.81.

In addition, the size of engineering workshops in TVET institutions in the Lake Victoria Region was rated at only 2.71, with 104 (47.7 percent) of the trainees indicating that their engineering workshops are far inadequate in size. Only 70 (32.1 percent) of the trainee respondents alluded that their workshops are sizeable enough and can accommodate all the students during the engineering lessons.

The study established that there is a statistically significant correlation between workshop utilization and skill acquisition of trainees in diploma-level engineering courses at TVET Institutions. It was, therefore, possible to reject the hypothesis that there is no statistically significant relationship between Workshop Utilization and Skill Acquisition of Trainees in Diploma-level Engineering Courses at TVET Institutions.

The study further established that trainees in TVET institutions with adequate well-established and functional workshops with the right tools are likely to record higher skills acquisition than those whose institutions offer the inadequate opportunity for workshop utilization.

This finding supported the assertion of Owiti and Nyaga (2007) which established that the availability of facilities has a direct link to the trainee's skill acquisition of learners in their examinations. Similarly, Ambogo (2012) had also pointed out that a good learning environment is one in which sufficient coherence is made between the supply and distribution of resources, buildings, and equipment. The finding also resonates with that of and Audu and Musta'amal (2013) who had acknowledged that workshop tools and equipment are very important to the successful implementation of technical training programs.

VI. CONCLUSION

The study concluded that there is a statistically significant correlation between workshop utilization and skill acquisition of trainees in diploma level engineering courses at TVET Institutions whereby the hypothesis that there is no statistically significant relationship between Workshop Utilization and Skill Acquisition of Trainees in Diploma-level Engineering Courses at TVET Institutions was rejected. In addition, the study further established that trainees in TVET institutions with adequate well-established and functional workshops with the right tools are likely to record higher skills acquisition than those whose institutions offer the inadequate opportunity for workshop utilization.

REFERENCE

- [1]. Akomolafe, O.C & Adesua, O.V (2016). The Impact of Physical Facilities on Students' Level of Motivation and Academic Performance in Senior Secondary Schools in South West Nigeria ; *Journal of Education and Practice* www.iiste.org Vol.7, No.4, 2016
- [2]. Alimi, O., Ehinola, G., & Alabi, F. (2012). School Types, Facilities and Academic Performance of Students in Senior Secondary Schools in Ondo State, Nigeria, *International Education Studies*, Vol. 5, No. 3, pp. 44-48.
- [3]. Ambogo M, M. (2012). The Relationship between Availability of Teaching/Learning Resources and Performance in Secondary School Science Subjects in Eldoret Municipality Kenya. Unpublished thesis. Nairobi University.
- [4]. and Improvement Strategies: *Journal of Education and Learning*, Vol. 4, No. 1;2005.
- [5]. Audu, R. (2014). Assessment of the Teaching Methods That impact the Acquisition of Practical Skills. *Asian Social Science*, (21), 35-41.
- [6]. Audu, R., Musta'amal, A. H. B., Kamin, Y. B., & Saud, M. S. B. (2013). Provision of workshop tools and equipment: necessity for technical vocational education graduates skills acquisition. In *2nd International Seminar on Quality and Affordable Education (ISQAE)* (pp. 74-75).
- [7]. Ayua, M. T. (2006). Consolidating and Sustaining Industrial Performance of School Product in Technology Education for National Development. In the Proceedings of the Conference Paper Presented at the Nigerian Association of Teachers of Technology (NATT). Lagos
- [8]. Chukwumaijen, B. et al. (2015). Towards Quality TVET Programs in Nigeria, Challenges
- [9]. Koul, L. (2004). *Methodology of Educational Research*, 3rd edition. New Delhi: *Wishwa Prakashan Publications*.
- [10]. Njeru, E. & Orodho, J. (2003). Access and Participation in Kenya. *Nairobi. Institute of Policy Analysis and Research*.
- [11]. Nyerere, J. (2009). Technical & Vocational Education and Training (TVET) Sector Mapping in Kenya, For the Dutch Schokland TVET Programme. *Edukans Foundation*.
- [12]. Oduyemi, O. (2000). "Meeting the challenges of the 21ST Century in Technical and Vocational Education," Presented at a National Seminar on Technical and Vocational Education in Nigeria, Abuja, November 2000.

- [13]. Onyene, V. E., Olusanya, O., Salisu, R. A. and Johnson, O. (2007). Production of Skill Oriented Graduates for the Labor Market. A Paper Presented at the 1st International Conference of the Nigerian Association for Educational Administration and Planning Lagos, Nigeria. NAEAP
- [14]. Palguna, D., Joshi V., Chakaravarthy V, Kothari R., & Subramaniam L.V. (2015). Analysis of sampling a logarithm for twitter: International Joint Conference on Artificial Intelligence.
- [15]. Rothbauer, &Paullette. (2008). "Triangulation" in Given, Lisa (Ed.), "The Sage Encyclopedia of qualitative research Methods." Sage Publications. Pp. 892-894.
- [16]. Turano, A.A. (2005). The Impact of Classroom Environment on Student Learning, Theses, and Dissertations. Retrieved from <http://rdw.rowan.edu/etd/1089>
- [17]. Udofia, A. E, Ekpo, A. B., Nsa, E. O., & Akpan, E. O. (2012). Instructional Variables and Students' Acquisition of Employable Skills in Vocational Education in Nigerian Technical Colleges. *Scholarly Journal of Education*. 1(2), 13-19.
- [18]. Umar, I. Y. &Ma'aji, A. S. (2010). Repositioning the Facilities in Technical College Workshop for Efficiency: A Case Study of North Central Nigeria. *Journal of TEM Teacher Education*: 47(3), 1-9.

Dorcas A. Ojera, et. al. "Impact of Workshop Utilization on Trainees Skill Acquisition in Engineering Courses in TVET Institutes- Lake Victoria Region, Kenya." *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 26(07), 2021, pp. 01-06.