

## **Influence of Industrial Engagement on Development of Employability skills of TVET Graduates in Meru County**

*Lucy Ndumba Mutembei<sup>1\*</sup>, Tarsilla Kibaara<sup>1</sup>, Paul Maku Gichohi<sup>1</sup>*

<sup>1</sup>*Kenya Methodist University, P.O Box 267-60200, Meru, Kenya*

*\*Correspondence email: ndumbalucy23@gmail.com*

### **Abstract**

Development of employability skills among TVET graduates increases their employability. However, despite reforms in TVET education in Kenya, Meru County continue to grapple with high unemployment rates among TVET graduates due to skills gap. This research aimed to establish the influence of industrial engagement on development of employability skills of TVET graduates in Meru County, Kenya. The Knight and Yorke Theory of Employability and Human Capital Theory informed the study. A sample size of 6 TVET institutions, 142 TVET trainees, 12 trainers, 72 graduates, 12 HoDs, and 6 Principals and 5 Key Informants were selected for this study. Simple random sampling, census sampling, purposive sampling, stratified sampling and referral sampling techniques were used to select participants. The study adopted a mixed-research approach, and used convergent parallel research design. Questionnaires and interview guides were used to collect data. The quality of data collection tools was assured by checking their validity and reliability. Descriptive and inferential statistics were applied to quantitative data and themes were generated from qualitative data. The study established a significant relationship between industrial engagement and development of employability skills. The study underscores the need for TVETs to strengthen partnerships with industries to enhance development of employability skills. The study concluded that there exists a skill mismatch in TVET graduates. The study recommended TVETs in Meru County, and Kenya at large, to embrace dual apprenticeship system which integrates school-based and work-based learning. The study further recommended TVET institutions to have elaborate connections and partnerships with industries in order ease the burden of looking for attachments, internships and apprenticeship by trainees.

**Keywords:** *Industrial engagement, Employability skills, TVET institutions, Graduates, Meru County*

*IJPP 12(3); 58-71*

## 1.0 Introduction

Technical and Vocational Education and Training (TVET) is significant in producing skilled labour necessary for self-employment, as well as offering diverse job opportunities to the graduates. Vocational education lowers the rate of unemployment by enhancing employability skills among TVET graduates, thus producing highly qualified workforce needed by the Kenyan labour market (Onojah, 2022; Muriuki & Dominic, 2022). Additionally, technical training supports industries through provision of skilled workforce, thus accelerating economic development (Saeed, 2022; Mesuwini et al., 2020; Yamada & Otchia, 2020). Employability rate among TVET graduates can increase if employability skills are developed. Considering the significant role played by TVET in skill development, the Ministry of Education needs to collaborate and partner with industry to enhance employability of TVET graduates. Industrial engagement entails involvement of industry in curriculum development, apprenticeship, internship, attachment, private partnerships, dual vocational training and other areas that offer trainees job experience to help them transition to the world of work (Republic of Kenya, 2022; Onojah, 2022).

Youth unemployment is a global concern which can be addressed by vocational training. The market economy is increasingly becoming industrialized, thereby necessitating industrial engagements which link TVET graduates to the labor market (Chigbu & Nekhwevha, 2022). In Europe and Asia TVET training entail class training and

industrial attachment (Kenayathulla, 2021; Nusrat & Sultana, 2019). In Germany, exposure of TVET trainees to dual vocational training has led to high rate of employment of TVET graduates. Nathaniel (2020) assessed contribution of TVETs to the development of economy in three continents; namely, Africa, Asia and Europe. His study recommended involvement of industry in TVET training curriculum through linkages at both national and institutional levels in areas of policy development, policy implementation and work placements.

In Africa, there is a mismatch between graduates' skills and industrial requirements, leading to increased youth unemployment (Chigbu & Nekhwevha, 2022; Ochieng & Ngware, 2023; Mabunda & Frick, 2020). Employability skill gap remains a major problem facing the employer, and those seeking employment (Saeed, 2022). In West Africa, training and exposure gained through student work experience increases productivity and broadens knowledge (Adeosun et al., 2022). Employers are dissatisfied with graduates who lack both the technical skills and the employability skills that match the industry (Awodiji & Magodidi, 2023). For instance, two major barriers to youth employment in Libya are lack of relevant skills, and a mismatch of skills learnt in TVET institutions and the skills demanded by the industry (United Nations International Children's Fund [UNICEF], 2023).

In Kenya, a study by Kiruga et al. (2018) indicated that the courses offered by TVET institutions lacked the necessary employability skills for the industry. Mwaura

et al. (2022) examined TVET institutions in Nairobi and found out that industrial attachment has a great influence on development of employability skills of graduates. Though internships, attachment and dual vocational systems expose trainees to industry and understanding work experiences, getting placement vacancies remains a great challenge not only among Meru TVET institutions, but also TVET institutions across Kenya; thus, compelling the need to foster partnerships with the industry (Kithinji, 2022; Otieno & Onyango, 2021).

***Statement of the problem***

Technical education and training responds to the evolving technological and economic landscape by equipping youth with skills relevant to the labour market (UNESCO, 2021; UNEVOC, 2017; Oviawe et al., 2017). Sustainable Development Goal 4 underscores the need to enhance TVETs in ensuring acquisition of essential knowledge, skills, and competencies for employment and entrepreneurship (UNESCO, 2021). In Kenya, although TVET plays a crucial role in skill development and industrialization for Vision 2030, TVET graduates' employability remains low due to a skills mismatch (Muriuki & Dominic, 2022). The African Development Bank notes that employers are dissatisfied with TVET graduates' skills, stressing the need for industry involvement in education (AfDB, 2022). Despite initiatives to bridge the gap between industry and TVETs, the impact of industrial engagement on developing employability skills in Meru County remains unexplored, justifying this study (TVETA, 2020).

***Research Objective***

To determine whether industrial engagement influence development of employability skills of TVET graduates in Meru County.

***Research hypothesis***

**HO<sub>1</sub>** Industrial engagement has no significant influence on development of employability skills of TVET graduates in Meru County.

*“The findings revealed there were neither connections between TVET institutions and industries nor did the TVETs send expert trainers during field assessments due to financial constraints”*

***Literature Review***

Technical and Vocational Education and Training (TVET) aims to reduce unemployment by equipping youth with relevant skills, competencies, and attitudes necessary for the workforce; thereby, fostering economic development (AfDB, 2022; Onojah, 2022). The skills mismatch between employers and job seekers underscores the need for stronger ties between TVET institutions and the labor market, through industrial engagements such as attachments, apprenticeships, internships, dual vocational training, and private-public partnerships (Saeed, 2022; Kithinji, 2022; Kenayathulla, 2021).

Globally, quality skill development is achieved through industrial involvement in TVET, with public-private partnerships being crucial in adapting to technological advancements (Nathaniel, 2020; Nurjanah & Ana, 2022). European nations like Germany, Austria, and the Netherlands have employer-centered TVET systems, where the industry contributes tools, equipment, expertise, and training venues, enhancing the relevance of the skills taught (ACET, 2023; Gessler et al., 2022; Shafi et al., 2021). In Africa, the shortage of technical skills threatens economic development and industrialization, with studies suggesting that increased industry involvement in vocational education can reduce the skills gap (ACET, 2023; Guàrdia et al., 2021; Geressu, 2017).

In Kenya, securing internships and industrial attachments remains challenging, despite the crucial role they play in developing employability skills (Mwaura et al., 2022; Otieno & Onyango, 2021; Muthoni et al., 2018). The minimal industry involvement in TVET programs leads to a mismatch between curriculum offerings and market demands (TVETA, 2020; OECD, 2017). Aligning TVET curricula and resources with market needs is essential for empowering trainees with industry-relevant skills, with the dual vocational system implemented in Mombasa and Nairobi shown to effectively address youth unemployment (Muchira et al., 2023; Kithinji, 2022).

## **2.0 Materials and Methods**

The study was carried out among TVET institutions in Meru County. The study was anchored on pragmatism and took a mixed

research approach and used convergent parallel research design for concurrent triangulation. Using mixed method approach, data on industrial engagement and development of employability skills was collected, analysed and integrated. The target population comprised of trainees, trainers, graduates, HoDs, and Principals of TVET institutions and Key Informants. The sample size of the study comprised of 6 TVET institutions, 142 trainees, 12 trainers, 72 graduates, 12 HoDs, 6 Principals, while Key Informants saturation was reached at 5. Census sampling was used to select TVET institutions, Principals and HoDs, simple random sampling was employed to select trainers, while stratified sampling was employed to select trainees and graduates. The strata were the departments.

Questionnaires were administered to trainers, trainees and graduates, while interview guides were administered to Principals, HoDs and Key Informants from the industry. Pre-testing of instruments was carried out in Nyeri National Polytechnic and Mathenge Technical Training Institute to check validity and reliability of the instruments. Nyeri County was selected because it has similar characteristics with Meru County. Cronbach Alpha coefficients were used to test reliability, while construct and face validity assessed validity. Quantitative data was obtained, and descriptive statistics comprising means, standard deviations, and percentages were computed and analyzed. The qualitative data collected was analyzed using thematic techniques. Data was presented in tables, themes and narrations. The results of both quantitative and qualitative data analysis were cross-

examined to determine their convergence and divergence.

### **3.0 Results and Discussion**

The sample size of the study was 249 participants, which included 142 trainees, 12 trainers, 72 graduates, 11 HoDs, 6 Principals and 6 Key Informants from the industry. Out of the 226 questionnaires administered to the trainees, trainers and TVET graduates, 171 were returned, translating to 123(86%) response rate for trainees, 11(92%) for trainers and 68(95%) for graduates. From the interview guides, the response rate was 11(92%) for HoDs and 5(83%) for Principals, while the saturation of Key Informants was reached at 5. The overall response rate was 89.30% which was sufficient to carry out the study.

#### ***Background Information of Respondents***

The participants of the study were trainees, trainers, graduates, HoDs, Principals and Key Informants. There were more male trainees 71(57.7%) compared to 52(42.3%) female, 7(63.6%) male trainers compared to 4(36.4%) female, 53(78.4%) male graduates

compared 15(13.5%) female, and 7 (63.3%) male HoDs compared to 4(36.4%) female. This shows there is gender disparity, with male dominance in technical and vocational education in Meru County. This agrees with the study by Mwashighadi et al. (2023), where 94.7% of the trainees in the coastal region were male, while 70% of trainers were male. However, out of the 5 principals who responded, 4 were female, showing there were more women in instructional leadership positions. Majority (81.8%) of the trainers were degree holders, thus complying with the employment policy where a TVET trainer is required to have a Bachelor's Degree in the relevant field.

#### ***Influence of Industrial Engagement on Development of Employability skills of TVET Graduates in Meru County***

The study investigated the impact of industrial engagement on development of employability skills in TVET graduates in Meru County. Industry connections, internships, expert guidance, dual vocational training, and partnerships were examined, and results presented in Table 1.

**Table 1**

*Trainee’s Responses on Industrial Engagement*

Industrial Engagement N=123	SD	D	MA	A	SA	Mean	STD
My institution has connections to industry that help the trainees to acquire practical experiences	39(31.7)	26(21.1)	16(13)	21(17.1)	21(17.1)	2.67	1.497
My institution has connections to industry that are able to provide students with internship	41(33.3)	30(24.4)	13(10.6)	16(13)	23(18.7)	2.59	1.519
During industrial attachments, my institution sends experts trainers to assess and offer expert guidance.	12(9.8)	7(5.7)	22(17.9)	38(30.9)	44(35.8)	3.77	1.266
During attachments, the trainee and the trainers work closely with the supervisor.	12(9.8)	14(11.4)	28(22.8)	25(20.3)	44(35.8)	3.61	1.334
I am exposed to dual vocational training that will help me secure a job	36(29.3)	30(24.4)	9(7.3)	26(21.1)	22(17.9)	2.74	1.514
My institution has collaborations and partnerships with the industry for dual apprenticeship system.	39(31.7)	25(20.3)	12(9.8)	22(17.9)	25(20.3)	2.75	1.555

Results in Table 1 indicate that a significant portion of trainees feel that industrial engagement does not sufficiently influence the development of employability skills among TVET graduates. 65 (52.8%) of respondents disagreed that TVET institutions have connections with industry that facilitate practical experiences, and 71(57.7%) reported a lack of industry connections

providing internships. These findings align with Adeosun et al. (2022), who noted that a majority of respondents lacked support from TVET institutions to secure internships. Moreover, 66(53.7%) of trainees were not exposed to dual vocational training, and over half agreed that there were no collaborations for apprenticeships with industry partners. The overall mean score is 2.64, below the



midpoint on the Likert scale, suggesting a predominantly negative perception; with high standard deviations indicating varied views among respondents. These results underscore the disconnect between TVET institutions

and industry, thereby limiting opportunities for hands-on training and exacerbating skill mismatches (Muchira et al., 2023; Adeosun et al., 2022).

**Table 2**

*Trainer’s responses on industrial engagement*

Industrial Engagement (N=11)	SD	D	MA	A	SA	Mean	STD
My institution has connections to industry that are able to provide trainees with attachments	0	2(18.2)	3(27.3)	4(36.4)	2(18.2)	3.55	1.036
My institution has connections to industry that are able to provide trainees with internships	0	3(27.3)	2(18.2)	4(36.4)	2(18.2)	3.73	1.489
During industrial attachments, I am sent by my institution as an expert’s trainer to assess trainees.	0	1(9.1)	2(18.2)	3(27.3)	5(45.5)	4.09	1.044
During attachments, the trainee and trainer work closely with the supervisor to offer experts guidance.	1(9.1)	2(18.2)	1(9.1)	2(18.2)	5(45.5)	3.45	1.128
My department has collaborations and partnerships with the industry for dual apprenticeship.	0	3(27.3)	2(18.2)	4(36.4)	2(18.2)	2.82	1.328

Table 2 reveals insights from trainers regarding the influence of industrial engagement on the development of employability skills among TVET graduates. More than half, 6(54.5%) of respondents acknowledged that TVET institutions have

connections with industry for providing attachments and internships, while a significant majority 8(72.7%) agreed that they are sent as expert trainers to assess trainees. Moreover, 7(63.6%) indicated they work closely with supervisors to offer expert

guidance, highlighting a collaborative effort in skill development aligned with industry needs. However, only 6(54.5%) agreed that there are collaborations and partnerships for dual apprenticeship, contradicting the trainees' perceptions. Despite the overall mean score of 2.82 which indicate a negative

perception, and a considerable variation in responses, these findings underscore the importance of industrial attachments and internships in enhancing practical skills and employability (Liang & Klein, 2022; Kithinji, 2022)

**Table 3**  
*Graduates Responses on Industrial Engagement*

Industrial Engagement	SD	D	MA	A	SA	Mean	STD
N=68							
My institution had connections to industry that help the trainees to acquire practical experiences	23(33.8)	15(22.1)	8(11.8)	6(8.8)	16(23.5)	2.66	1.589
My institution had connections to industry that are able to provide students with internship	24(35.3)	15(22.1)	4(5.9)	11(16.2)	14(20.6)	2.65	1.591
During industrial attachments, my institution sent experts trainers to assess and offer expert guidance and support to the trainee.	0	0	8(11.8)	15(22.1)	45(66.2)	4.54	.700
During attachments, the trainee and the trainers worked closely with the supervisor for expert guidance and support.	0	4(5.9)	11(16.2)	8(11.8)	45(66.2)	4.38	.962
My institution had collaborations and partnerships with the industry	4(5.9)	11(16.2)	9(13.2)	18(26.5)	26(38.2)	3.75	1.286
My institution had dual apprenticeship systems that helped trainees to secure jobs after completion.	23(33.8)	9(13.2)	10(14.7)	21(30.9)	5(7.4)	2.65	1.412



Table 3 presents the findings from graduates regarding the influence of industrial engagement on the development of their employability skills. Results show that 38(55.9%) indicated their institutions lacked connections with industry for practical experiences and internships, supported by a mean score of 2.66; and a standard deviation of 1.589, suggesting inadequate acquisition of hands-on skills (Nusrat & Sultana, 2019). However, 53(78%) reported working closely with supervisors, and 60(88.3%) agreed that expert trainers were sent to assess and provide guidance, highlighting efforts to address technical competencies and employability skills gaps (Liang & Klein, 2022). Nevertheless, only 44(64.7%) noted collaborations with industry. Responses on dual apprenticeship systems were mixed,

with 32(47%) disagreeing on its effectiveness, indicating varied perceptions and the need for enhanced industry partnerships to improve graduates' job prospects (Kithinji, 2022; Shafi et al., 2021; Kenayathulla, 2021).

***Correlation results between industrial engagement and Development of Employability Skills of TVET Graduates***

The null hypothesis of the study stated that industrial engagement does not influence development of employability skills of TVET graduates in Meru County. A Pearson’s correlation test was carried out to test the linear relationship and inform the decision on hypothesis testing. The correlation results are shown in Table 4.

**Table 4**

*Correlations of on Industrial Engagement on Hypothesis*

Responses	Correlations Coefficient (r)	p-value	N
Trainees’ response	0.650	0.00	123
Trainer response	0.748	0.00	11
Graduates’ response	0.348	0.03	68

Table 4 indicates the relationship between industrial engagement and development of employability skills which was tested using Pearson's correlation from trainees, trainers, and graduates. A Pearson correlation coefficient of 0.650 was obtained from trainees’ tool, indicating a positive linear relationship. The p-value of 0.00 indicated the relationship was statistically significant at 0.05 level, thus the null hypothesis was rejected. Regarding the trainers tool, a Pearson correlation coefficient of 0.748 was

obtained, indicating a positive linear relationship. The p-value of 0.00 indicated the relationship was statistically significant at the 0.05 level supporting the rejection of the null hypothesis. This indicates that exposure to the industry enhances development of employability skills. Furthermore, there is a positive linear association of graduates’ tool with a Pearson correlation coefficient of 0.348 and a p-value of 0.03, indicating a statistical significance at the 0.05 level. The

results support the rejection of the null hypothesis.

### ***Qualitative Findings on Industrial Engagement and Development of Employability Skills of TVET Graduates***

The study interviewed Heads of Departments (HoDs), Principals, and Key Informants, as well as trainees, trainers, and TVET graduates to establish the influence of industrial engagement on employability skills among TVET graduates. Partnerships and collaborations emerged as crucial themes highlighted by trainers and graduates, providing real-world exposure and enhancing skills and confidence through curriculum alignment, guidance, and supervision (Kithinji, 2022). However, HoDs and Principals noted challenges such as financial constraints which prevent regular dispatch of expert trainers for trainee assessments, resulting to trainees relying on supervisor reports. They acknowledged existing connections with industry, primarily through internships and attachments, but emphasized the need for more robust dual vocational training integration to enhance skills acquisition both within institutions and in industry settings. Key Informants echoed these sentiments, advocating for field trips, internships, and dual vocational training as pivotal in enhancing trainees' practical experiences and skills development.

### ***Integration of quantitative and qualitative findings on influence of industrial engagement and development of employability skills TVET graduates***

Both quantitative and qualitative results were integrated to get the convergent and divergent

views. The results show industrial engagement influence development of employability skills among TVET graduates in Meru County. From the descriptive statistics, responses of the trainees and the graduates were in agreement, but differed with those of the trainers. However, on inferential statistics, there was a positive linear association between the trainers' responses, a Pearson correlation coefficient of 0.748, and a p-value of 0.00, indicating the relationship between industrial engagement and development of employability was statistically significant at 0.05 level, thus rejecting the null hypothesis. The results indicate that exposure to the industry has an influence on development of employability skills. From qualitative findings, the HoDs, Principals and Key informants indicated that exposure to the industry enhanced development of employability skills.

## **4.0 Conclusion**

The findings revealed there were no connections between TVET institutions and industries. Equally, TVET institutions did not send expert trainers during field assessments due to financial constraints. The study highlights the need for TVET institutions to strengthen partnerships with industries to provide trainees with more opportunities for practical experience, internships, and exposure to real-world scenarios, thus enhancing their employability skills. The results further emphasize the significance of partnerships and collaborations between TVET institutions and industries through internships, attachments and dual apprenticeship. The study, therefore, concludes that there is skill mismatch due to

lack of necessary skills and knowledge required to meet industrial needs since industrial engagement enhances development of employability skills among graduates.

## 5.0 Recommendations

The study noted there were no connections, partnerships and collaborations between TVET institutions and the industry, which deterred acquisition of skills and competences relevant to the industry leading

to unemployment. The study recommends TVET institutions in Meru County, and Kenya in general to embrace dual apprenticeship system which integrates school-based learning with work-based learning. The study equally recommends TVET institutions to have elaborate collaboration and partnerships with the industry which would ease the burden of looking for attachments and internships by TVET trainees and graduates.

## References

- Adeosun, O. T., & Shittu, A. I. (2022). Small–medium enterprise formation and Nigerian economic growth. *Review of Economics and Political Science*, 7(4), 286-301. <https://doi.org/10.1108/REPS-07-2020-0089>
- Africa Center for Economic Transformation (ACET) (2023). *How Technical and Vocational Education Can Help Close Skills Gaps in Africa*. <file:///C:/Users/HP/Downloads/Glob al-Perspectives-The-Africa-Roundtable-5-2023-Berlin-ACET-Whitepaper.pdf>
- Africa Development Bank Group (2022). *Skills for Employability and Productivity in Africa (SEPA) Action Plan, 2022–2025*. [https://www.afdb.org/sites/default/files/documents/strategy-documents/sepa\\_-\\_action\\_plan\\_2022-2025.pdf](https://www.afdb.org/sites/default/files/documents/strategy-documents/sepa_-_action_plan_2022-2025.pdf)
- Awodiji, O. A., & Magogodi, C. (2023). Nexus between soft skills and technical vocational education and training graduate employability. *Innovation of Vocational Technology Education*, 3(2), 35–46. <https://doi.org/10.1016/j.ssaho.2024.100896>
- Chigbu, B. I., & Nekhwevha, F. H. (2022). Academic-faculty environment and graduate employability: variation of work-readiness perceptions. *Heliyon*, 8(3), 1-10. [https://www.cell.com/heliyon/pdf/S2405-8440\(22\)00405-4.pdf](https://www.cell.com/heliyon/pdf/S2405-8440(22)00405-4.pdf)
- Geressu, B. S. (2017). Impact of competence-based training on employability of technical and vocational graduates in Ethiopia. *Tuning journal for higher education*, 5(1), 101–119. [https://doi.org/10.18543/tjhe-5\(1\)-2017pp101-119](https://doi.org/10.18543/tjhe-5(1)-2017pp101-119)
- Gessler, M., & Peters, S. (2022): *Dual apprenticeship and continuing vocational education and training in Central and Eastern Europe: Opportunities and obstacles for German family businesses*. Stiftung Familienunternehmen. <https://hdl.handle.net/10419/273455>

- Guàrdia, I., Mancini, F., Jacobetty, P., & Maina, M. (2021). Graduates' employability skills in east Africa. *Journal of teaching and learning for graduate employability*, 12(2), 169–184. <https://doi.org/10.21153/jtlge2021vol12no2art988>
- Kenayathulla, H. B. (2021). Are malaysian tvet graduates ready for the future? *Higher education quarterly*, 75(3), 453–467. <https://doi.org/10.1111/hequ.12310>
- Kiruga, A. M., Wandago, B. O., & Miano, K. (2018). An Investigation on Youth Employability Skills in TVET Institutions in Mombasa County. *Africa Journal of Technical and Vocational Education and Training*, 3(1), 78-93. <https://afritvet.org/index.php/Afritvet/article/view/62>
- Kithinji, W. K. (2022). Introducing Dual Apprenticeships Training in Kenya: Perspectives of Selected Donor Projects in Technical and Vocational Schools. *Journal of Popular Education in Africa*, 6(1), 102-113. <https://jopea.org/>
- Liang, B., & Klein, T. (Aug, 2022). *How to navigate life: the new science of finding your way in school, career, & beyond*. St. Martin's Press.
- Mabunda, N. O., & Frick, L. (2020). Factors that influence the employability of National Certificate (Vocational) graduates: The case of a rural TVET college in the Eastern Cape Province, South Africa. *Journal of Vocational, Adult and Continuing Education and Training*, 3(1), 89-108. <https://journals.co.za/doi/abs/10.14426/jovacet.v3i1.127>
- Mesuwini, J., Singh-Pillay, A., & Bomani, M. (2020). Perceptions of engineering lecturers and graduates on employability skills: A case of a TVET college in Kwazulu-Natal, South Africa. *International Journal of Social Sciences and Humanity Studies*, 12(2), 416-432. [https://agbioforum.org/sobiad.org/eJOURNALS/journal\\_IJSS/arhieives/IJSS-2020-2\\_ek/j-mesuwini.pdf](https://agbioforum.org/sobiad.org/eJOURNALS/journal_IJSS/arhieives/IJSS-2020-2_ek/j-mesuwini.pdf)
- Muchira, J. M., Kiroro, F., Mutisya, M., Ochieng, V. O., & Ngware, M. W. (2023). Assessing technical vocational education and training institutions' curriculum in Kenya: What strategies can position the youth for employment? *Journal of Adult and Continuing Education*, 29(2), 563-582. <https://doi.org/10.1177/14779714221145863>
- Muriuki, S., & Dominic, M. (2022). Retraining TVET Trainers in Kenya for Changing Global Trends and Dynamics. *Africa Journal of Technical and Vocational Education and Training*, 7(1), 61-75. <http://afritvetjournal.org/index.php/Afritvet/article/view/140>
- Muriuki, S., & Dominic, M. (2022). Retraining TVET trainers in Kenya for changing global trends and dynamics. *Africa Journal of Technical and Vocational Education and Training*, 7(1), 61-75.

- <http://afritvetjournal.org/index.php/Afritvet/article/view/140>
- Muthoni, D., Gunga, S., Mutahi, I., & Origa, J. (2018). Influence of industrial attachment on the competence of instructors and students in enabling creative innovations for industrialisation in Kenya. *Msingi Journal*, 1(1), 72-103. <https://doi.org/10.33886/mj.v1i1.5>
- Mwaura, A. N., Mugwe, M., Edabu, P., & Thinguri, R. (2022). Effectiveness of industrial attachment exposure in developing trainees' employability skills from TVET institutions in Nairobi County. *East African Journal of Education Studies*, 5(2), 274-284. <https://doi.org/10.37284/eajes.5.2.771>
- Nathaniel, S. P. (2020). Modelling urbanization, trade flow, economic growth and energy consumption with regards to the environment in Nigeria. *Geo Journal*, 85(6), 1499-1513. <https://link.springer.com/article/10.1007/s10708-019-10034-0>
- Nurjanah, I., & Ana, A. (2022, March). Work Readiness of TVET Graduates in the Context of Industry 4.0. In *4th International Conference on Innovation in Engineering and Vocational Education (ICIEVE 2021)* (pp. 34-38). Atlantis Press. <https://www.atlantispress.com/proceedings/icieve-21/125972285>
- Nusrat, M., & Sultana, N. (2019). Soft skills for sustainable employment of business graduates of Bangladesh. *Higher Education, Skills and Work-Based Learning*, 9(3), 264-278. <https://www.emerald.com/insight/content/doi/10.1108/HESWBL-01-2018-0002/full/html>
- Ochieng, V. O., & Ngware, M. W. (2023). Adoption of education technologies for learning during COVID-19 pandemic: The experiences of marginalized and vulnerable learner populations in Kenya. *International journal of educational reform*, 32(4), 464-487. <https://journals.sagepub.com/doi/full/10.1177/10567879221076081>
- Onojah, A. O., Onojah, A. A., Abd-el-latif Adekunle, A. E., & Taiwo, S. A. (2022). Effects of Social Networking Sites on the Effectiveness of Job Opportunity Acquisition in Labour Markets. *Indonesian Journal of Community Services in Engineering & Education (IJOCSEE)*, 2(1), 8-16. <http://download.garuda.kemdikbud.go.id/article.php?article=2937319&val=25933&title=Effects%20of%20Social%20Networking%20Sites%20on%20The%20Effectiveness%20of%20Job%20Opportunity%20Acquisition%20in%20Labour%20Markets>
- Organisation for Economic Co-operation and Development (2017). *Education at a glance: Education and social outcomes*. Paris: OECD Publishing. <http://10.1787/eag-2017-en>
- Otieno, A., & Onyango, M. (2020). The impact of industrial attachment in tvet institutions; a case study of engineering departments in masai technical training



- institute in kajiado, kenya. *The Kenya Journal of Technical and Vocational Education and Training*, 14(1), 1-30. <http://erepository.uoeld.ac.ke/>
- Oviawe, J. I., Uwameiye, R., & Uddin, P. S. (2017). Best Practices in Technical Education Programme for Students' Capacity Building and Sustainable Development in the 21st Century. *Journal of Technical Education and Training*, 9(2), 1-12. <https://penerbit.uthm.edu.my/ojs/index.php/JTET/article/view/1504>
- Saeed, M., Gull, M., & Altaf, F. (2022). Effectiveness of technical and vocational education: A meta-analysis. *Pakistan Journal of Educational Research and Evaluation (PJERE)*, 10(1), 1-22. <http://111.68.103.26/journals/index.php/PJERE/article/viewFile/5725/2677>
- Shafi, M., Liu, J., Jian, D., Rahman, I. U., & Chen, X. (2021). Impact of the COVID-19 pandemic on rural communities: a cross-sectional study in the Sichuan Province of China. *BMJ open*, 11(8), e046745. <https://doi.org/10.1136/bmjopen-2020-046745>
- Technical and Vocation Education and Training Authority (2020). *National TVET Standards: The Kenya Report*. <https://www.tveta.go.ke/wp-content/uploads/2021/02/National-TVET-Standards-Kenya-Report-2020-5.12.-2020-2.pdf>
- United Nations Education and Vocation (2017). *Tackling youth unemployment through TVET: Report of the UNESCO UNEVOC online conference*. United Nations Education, Scientific and Cultural Organization. <https://unevoc.unesco.org/home/Tackling+youth+unemployment+through+TVET>
- United Nations Educational, Scientific and Cultural Organization. (2021). *The United Nations world water development report 2021: Valuing water*. United Nations. <https://unevoc.unesco.org>
- United Nations International Children's Fund (2023). *Youth Employability Skills in Lybia: Final Report*. <https://www.unicef.org/mena/media/23501/file/Youth%20Employability%20Study%20Final%20Report%20Sept%20kfw%20eu-OP-03.pdf>
- Yamada, S., & Otchia, C. S. (2020). Perception gaps on employable skills between technical and vocational education and training (TVET) teachers and students: the case of the garment sector in Ethiopia. *Higher Education, Skills and Work-Based Learning*, 11(1), 199-213. <https://www.emerald.com/insight/content/doi/10.1108/HESWBL-08-2019-0105/full/html>