

## Technical and Vocational Education and Training Institutions as Catalysts of Reduction of Unemployment Rates in Kiambu County, Kenya

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**ABSTRACT:** Technical and Vocational Education and Training Institutions (TVETs) have been at the center of equipping students with prerequisite skills to fit into the job market by offering programmes aim to bridge the skills gap among students. However, in Kiambu County, rates of unemployment have continued to rise. Thus, the purpose of this study was to examine how TVETS act as catalysts for reduction of unemployment rates in Kiambu County. The study was anchored on the human capital theory. The study adopted mixed methodology and concurrent triangulation research design. Target population comprised 30 principals, 578 tutors and 4879 employed TVET graduates totaling 5487 respondents from which 372 respondents was sampled using Yamane's Formula. Stratified sampling was adopted to create 12 strata based on the number of sub-counties in Kiambu County. From each sub-county, one TVET principal was selected using purposive sampling. However, from each of the sampled TVETs, 5 tutors and 25 employed TVET graduates were selected using simple random sampling. This enabled the researcher to sample 12 principals, 60 tutors and 300 employed TVET graduates. Questionnaires were used to collect data from employed TVET graduates whereas interview guides were used to collect data from principals and tutors. Qualitative data were analyzed thematically along the objectives and presented in narrative forms. Quantitative data were analyzed using descriptive statistics such as frequencies and percentages and inferentially using Pearson's Product Moment Correlation Analysis with the help of Statistical Packages for Social Sciences and presented by using tables. The study found that there is an increasing rate of unemployment in Kiambu County for the last five years. To mitigate these challenges, TVETs have refocused the training to equip students with job-specific practical skills, entrepreneurship education, linkages and internship as well as integration of ICT and innovation. However, much is yet to be fully realized in improving status of unemployment rates. Thus, the study recommends that TVETs should collaborate closely with local and international industries to ensure that their training programmes align with current market demands. By continuously updating the curriculum to include emerging technologies, sector-specific skills, and soft skills like communication and problem-solving, TVET graduates will be better equipped to meet employers' needs.

**KEYWORDS:** TVETs, Unemployment rates, Kiambu County

### INTRODUCTION

Tertiary education has long been recognized as a critical driver of economic development and employment creation. Across the globe, countries have increasingly invested in higher education institutions, seeking to bolster national capacities for innovation, skill development, and workforce readiness. In Germany, the tertiary education system, particularly its dual education model, is often lauded for its close alignment with labor market needs. A study by Baethge, Solga and Powell (2021) highlights how Germany's universities and vocational education programmes directly address the skills gap, helping to reduce unemployment rates among graduates. According to the Federal Employment Agency (2022), unemployment among university graduates in Germany is significantly lower than the national average, hovering around 2.5% in contrast to the general unemployment rate of 5.2%. This success is attributed to strong industry partnerships and practical training programmes that ensure students are job-ready upon graduation.

In France, the role of tertiary institutions in mitigating unemployment has been subject to debate. As noted by Chevalier, Harmon and Walker (2021), France's higher education system has struggled with a mismatch between graduates' skills and labor market demands. However, recent reforms aimed at integrating more professional pathways into university curriculums have shown promise. Statistics from the French Ministry of Higher Education (2023) show that unemployment among university graduates fell from 9.2% in 2020 to 7.8% in 2023, indicating positive shifts in the alignment of education and employment outcomes. China's rapid economic growth has been paralleled by significant expansion in tertiary education. The Chinese Ministry of Education (2022) reports that university enrollment has surged over the past decade. However, the high volume of graduates has led to employment challenges. As of 2023, the unemployment rate among young graduates was approximately 6%, a decline from 9% in 2020, as outlined in a report by Yang and Wang (2023).

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Government initiatives to encourage entrepreneurship among graduates and the development of innovation hubs within universities have played a pivotal role in this reduction. India faces unique challenges in terms of both the scale and diversity of its higher education system. Recent studies, such as Singh and Rao (2022), indicate that while India produces millions of graduates each year, unemployment among university graduates remains a persistent issue, with rates hovering around 17% in 2021. However, initiatives like the National Education Policy (2020) have aimed to revamp the tertiary education system, with a focus on employability skills and vocational training. By 2023, unemployment among graduates in India decreased to 14%, showing early signs of progress. In many countries in Sub-Saharan Africa, tertiary institutions are seen as crucial players in driving economic development and employment. According to a report by the African Union (2021), TVETs have been instrumental in developing skills in key sectors such as agriculture, technology, and healthcare. However, regional disparities in access to quality education have influenced outcomes. In countries like Nigeria, South Africa, Rwanda, Uganda, and Kenya, TVETs have varied success in addressing unemployment. A study by Nwogu (2022) found that Nigeria's graduate unemployment rate stood at 33% in 2021, though government policies aimed at integrating entrepreneurship training in tertiary institutions have led to slight improvements, with the rate falling to 28% in 2023. Nigeria faces a significant challenge with graduate unemployment, largely due to a disconnect between tertiary education and labor market needs. According to data from the Nigerian National Bureau of Statistics (2023), graduate unemployment fell from 35% in 2020 to 29% in 2023. This improvement has been attributed to initiatives such as the Student Industrial Work Experience Scheme (SIWES), which helps students gain practical experience during their studies, better preparing them for the workforce.

In South Africa, unemployment rates among graduates have remained stubbornly high, particularly in the context of a sluggish economy. A report by Statistics South Africa (2023) reveals that graduate unemployment stood at 9% in 2023, only a slight improvement from 2020's figure of 10.3%. Tertiary institutions have increasingly focused on entrepreneurship programmes to address these challenges, with notable success in sectors such as technology and green energy, as noted by Kraak (2021). Rwanda's focus on science, technology, engineering, and mathematics (STEM) education has played a significant role in reducing unemployment among its graduates. The Rwanda Education Board (2022) reports that graduate unemployment decreased from 19% in 2020 to 15% in 2023, driven by initiatives to foster innovation and research within universities.

The Kigali Innovation City project has been particularly influential, linking university research to industry needs. Uganda's tertiary institutions have faced challenges in addressing graduate unemployment, particularly due to limited infrastructure and funding. However, the government's Higher Education Financing Scheme, introduced in 2019, has helped increase access to tertiary education, particularly for students in STEM fields. Data from the Ugandan Bureau of Statistics (2022) shows a slight decrease in graduate unemployment from 24% in 2020 to 21% in 2023, with further improvements expected as education reforms take hold. In Kenya, tertiary institutions play a pivotal role in reducing unemployment, particularly in sectors like technology and agriculture. According to the Kenya National Bureau of Statistics (2023), graduate unemployment fell from 20% in 2020 to 16% in 2023, largely due to university-industry partnerships and government initiatives like the Ajira Digital Programme, which equips students with digital skills. In Kiambu County, unemployment has been a significant challenge, especially among the youth. According to the Kenya National Bureau of Statistics (KNBS) 2019 census, the unemployment rate in Kiambu stood at approximately 13.7%, reflecting the broader national unemployment issue. Youth unemployment is particularly severe due to a combination of limited job opportunities, skills mismatch, and rapid population growth.

In response, Technical and Vocational Education and Training (TVET) institutions in Kiambu have been instrumental in addressing unemployment by equipping students with practical skills required by employers. According to Wanjiku (2022), TVETs in the county have focused on industries such as construction, agribusiness, hospitality, and information technology. A study carried out by Muthoni, Mutuku and Njeri (2021) revealed that these vocational programmes aim to bridge the skills gap and promote entrepreneurship, offering practical alternatives to the traditionally academic paths that many young people pursue. However, much is yet to be done to interrogate how specific activities undertaken by TVETs have acted as catalysts for reducing unemployment rates in Kiambu County, hence the study.

### **STATEMENT OF THE PROBLEM**

TVETs have been at the center of equipping students with prerequisite skills to fit into the job market by offering programmes aim to bridge the skills gap and promote entrepreneurship, offering practical alternatives to the traditionally academic paths that many young people pursue. However, in Kiambu County, rates of unemployment have continued to rise. As noted earlier, a report by the Kenya National Bureau of Statistics (2019), unemployment rates in Kiambu stood at approximately 13.7%, reflecting the broader national unemployment issue. Youth unemployment is particularly severe due to a combination of limited job opportunities, skills mismatch characterized with rapid population growth. Despite these statistics, few empirical studies have interrogated TVETs as catalysts for reduction of unemployment rates in Kiambu County, hence the study.

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## OBJECTIVE OF THE STUDY

The study sought to address the following objectives;

1. To assess the status of unemployment rates in Kiambu County;
2. To examine how TVETs act as catalysts for reduction of unemployment rates in Kiambu County.

## THEORETICAL FRAMEWORK

The study was guided by the human capital theory whose proponent was Becker (1964) and is premised on the belief that investment in people through education and training increases their productive potential, leading to improved economic outcomes. This theory holds that education is an investment that yields returns in the form of higher productivity, better wages, and economic growth. This theory is highly relevant in studies about Technical and Vocational Education and Training (TVET) institutions as catalysts for reducing unemployment rates. TVETs focus on equipping individuals with practical skills and competencies directly aligned with the labor market's demands, thus enhancing employability. By applying this to TVETs, individuals acquire specialized skills that not only increase their personal economic value but also contribute to national economic development by addressing skills shortages and reducing dependency on informal employment sectors. In the context of reducing unemployment rates, TVETs act as critical avenues for human capital development. By focusing on industry-relevant training, TVETs help bridge the gap between education and employment, ensuring that individuals are well-prepared to enter the workforce. Thus, Human Capital Theory underpins the rationale for expanding and improving TVET programmes as a means to foster sustainable employment and economic progress.

## RESEARCH METHODOLOGY

The study adopted mixed methodology and concurrent triangulation research design. Target population comprised 30 principals, 578 tutors and 4879 employed TVET graduates totaling 5487 respondents from which 372 respondents was sampled using Yamane's Formula. Stratified sampling was adopted to create 12 strata based on the number of sub-counties in Kiambu County. From each sub-county, one TVET principal was selected using purposive sampling. However, from each of the sampled TVETs, 5 tutors and 25 employed TVET graduates were selected using simple random sampling. This enabled the researcher to sample 12 principals, 60 tutors and 300 employed TVET graduates. Questionnaires were used to collect data from employed TVET graduates whereas interview guides were used to collect data from principals and tutors. Qualitative data were analyzed thematically along the objectives and presented in narrative forms. Quantitative data were analyzed using descriptive statistics such as frequencies and percentages and inferentially using Pearson's Product Moment Correlation Analysis with the help of Statistical Packages for Social Sciences and presented by using tables.

## RESULTS AND DISCUSSIONS

This section presents the findings of the study based on the objectives. It also outlines the methods of presentation of the study findings and discussions.

### Response Rate

In this study, 300 questionnaires were distributed among employed TVET graduates, but 220 were successfully filled and returned. At the same time, 12 principals and 52 tutors were interviewed. These yielded response rates shown in Table 1;

**Table 1: Response Rate**

Respondents	Sampled Respondents	Those who Participated	Response Rate (%)
Principals	12	10	83.3
Tutors	60	52	86.7
Employed TVET Graduates	300	244	81.3
<b>Total</b>	<b>372</b>	<b>306</b>	<b>82.3</b>

Source: Field Data (2024)

From Table 1, principals registered a response rate of 83.3%, tutors registered 86.7% whereas the employed TVET graduates registered a response rate of 81.3%. This yielded an average response rate of 82.3% which, according to Creswell (2014), is appropriate besides being of acceptable levels for generalization of the results to the target population.

### Status of Unemployment Rates in Kiambu County

The study gathered information on students' completion rates (measured in percentages, %) from public technical training institutions. Results are shown in Table 2.

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**Table 2: Status of Unemployment Rates in Kiambu County (2019-2023)**

Financial Years	Unemployment Rates (%)
	%
2019	6.5
2020	9.8
2021	8.5
2022	10.2
2023	11.5

**Source: Kenya National Bureau of Statistics (2024)**

Data in Table 2 point to an increasing rate of unemployment in Kiambu County for the last five years. These findings corroborate the findings of research undertaken by Wainaina (2022) who also revealed that the county's reliance on agriculture, which faces challenges such as climate change and market instability, has left many rural households vulnerable to unemployment. According to Wainaina (2022), unemployment rates rose by 12% from 2019 to 2023, highlighting the urgent need for interventions that promote sustainable job creation and entrepreneurship in Kiambu County. These findings also lend credence to the findings of a report authored by the KNBS (2019), which revealed that unemployment rates in Kiambu stood at approximately 13.7%. These findings point to the fact that, over the past five years, unemployment rates in Kiambu County have shown a concerning upward trend, reflecting both local and national economic challenges.

### Role of TVETs in Reduction of Unemployment Rates in Kiambu County

The study sought to establish how TVETs act as catalysts for reduction of unemployment rates in Kiambu County. Results are shown in Table 3;

**Table 3: Views of Employed TVET Graduates on the Role of TVETs in Reduction of Unemployment Rates**

Summary of Test Items	SA %	A %	U %	D %	SD %
TVETs have often equipped students with job-specific practical and technical skills in various fields students to make them employable	58.6	18.6	4.1	10.5	8.2
Many TVET programmes have integrated entrepreneurship education which has motivated students to start their own businesses and create job opportunities for themselves and others	61.8	17.7	4.5	10.9	5.1
TVETs sometimes collaborate with industries to offer internship and apprenticeship opportunities, which has allowed students to gain hands-on experience and improve their employability	70.0	10.9	3.2	11.4	4.5
By offering courses that focus on emerging technologies and innovation, TVETs help students become adept at modern solutions that can be applied in various sectors, creating more job opportunities	55.0	5.0	3.6	25.5	10.9
TVETs often focus on training individuals in rural areas and the informal sector, where there is a high potential for self-employment and small-scale enterprises.	58.2	7.3	5.5	19.1	9.9

**Source: Filed Data (2024)**

Table 3 reveals that 58.6% of the employed TVET graduates strongly with the view that TVETs have often equipped students with job-specific practical and technical skills in various fields students to make them employable with 18.6% in agreement. Only 4.1% were not decided, 10.5% disagreed whereas 8.2% strongly disagreed. Most (61.8%) of them strongly agreed that many TVET programmes have integrated entrepreneurship education which has motivated students to start their own businesses and create job opportunities for themselves and others whereas 17.7% agreed. However, 4.5% were undecided, 10.9% disagreed whereas 5.1% registered strong disagreement. These views were supported by the principals and tutors who stated that the focus of TVET has been to equip students with practical skills to enable them fit into the job market. On further probing, principal, P1, stated;

*In my institution, we pay much attention on equipping our students with practical skills which are in need in the labour market. This has enabled most of them to access job opportunities.*

Tutors also stated that TVET curriculum has been tailor-made to meet the demands of the job market and thus, trained has been focused on imparting hands-on practical skills to students. These findings support the findings of a study carried out by Baycar (2023), which established that TVET programmes are designed to align students' skillsets with the demands of the labor market. These programs often include hands-on training and industry-specific certifications, which give students a competitive edge when seeking employment. Martín (2021) did a study which revealed that TVETs play a key role in diversifying career options for

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students. Traditional academic pathways often overlook the need for specialized technical skills, leaving graduates with limited practical experience. TVETs, by contrast, offer tailored education in areas such as mechanics, electronics, construction, and healthcare. Majority (70.0%) of the employed TVET graduates strongly agreed that TVETs sometimes collaborate with industries to offer internship and apprenticeship opportunities, which has allowed students to gain hands-on experience and improve their employability whereas 10.9% agreed. However, 3.2% were undecided, 11.4% disagreed whereas 4.5% strongly disagreed. Similar views were expressed by the principals and tutors. This indicates that TVETs play a crucial role in bridging the gap between academic learning and the practical skills needed in various industries. These findings corroborate the assertions of Kapinga (2020) that many industries have reported that TVET graduates often lack the practical skills needed to perform effectively in the workplace, which has hindered their employability. However, when TVET institutions partner with industries for internships and apprenticeships, the students are trained according to the specific needs of the industry, effectively addressing this gap. These findings affirm the fact that such programmes help align the curriculum with industry standards, making the students more relevant in the job market. Slightly more than half (55.0%) of the employed TVET graduates were in strong agreement with the view that, by offering courses that focus on emerging technologies and innovation, TVETs help students become adept at modern solutions that can be applied in various sectors, creating more job opportunities while 5.0% agreed. However, 3.6% were undecided, 25.5% disagreed whereas 10.9% disagreed strongly. During the interviews, the principals and tutors also responded in favour of the view that integration of TVET curriculum has been able to create opportunities for students. These findings lend credence to the findings of a study conducted by Wekesa and Mumba (2020), which found that students who were exposed to digital fabrication technologies, 3D printing, and automation during their vocational training were more likely to secure jobs in the design, manufacturing, and engineering sectors. The study further found that the adaptability of TVET curricula to include cutting-edge tools allows students to master modern solutions that enhance productivity and efficiency in these sectors. Additionally, this knowledge gives students a competitive edge in industries that are rapidly adopting new technologies. This also supports the findings of research carried out by Ochola and Ouma (2022) who revealed that fostering a culture of innovation within TVETs encourages students to develop entrepreneurial mindsets. This approach not only prepares them for employment but also enables them to create job opportunities by starting their own businesses or innovating within existing companies. For instance, courses that incorporate innovation in sustainable agriculture, waste management, and green technologies are particularly valuable for developing countries. These courses empower students to offer solutions that address both local and global challenges, further expanding their employment prospects. These findings affirm the fact that students trained in innovative problem-solving techniques can apply these skills to real-world problems. In other words, TVET graduates who specialize in smart construction techniques and green building innovations contribute to the transformation of the built environment, leading to increased employment in these areas. Slightly more than half (58.2%) of the employed TVET graduates were in strong agreement with the view that TVETs often focus on training individuals in rural areas and the informal sector, where there is a high potential for self-employment and small-scale enterprises while 7.3% agreed. However, 5.5% were undecided, 19.1% disagreed whereas 9.9% disagreed strongly. The interviewees also stated that TVETs focus much of their training on how to create jobs in informal sectors or farming in rural areas. These findings are consistent with the findings of research carried out by Ananga and Siga (2020), who underscored that TVET programmes often target marginalized groups, including women, youth, and rural dwellers, providing them with practical skills for income generation. The focus on rural areas aligns with the increasing demand for self-employment in sectors like agriculture, crafts, and small-scale industries. These sectors form the backbone of rural economies, and TVET initiatives often provide the technical skills necessary to improve productivity and innovation within these fields. This is also consistent with the findings conducted by Osher and Mugambi (2021) who emphasized the importance of aligning TVET programs with the realities of the informal sector, which remains a dominant source of employment in many developing economies. The informal sector often lacks formal structures for skills development, and TVETs help fill this gap by offering practical, competency-based education that is directly applicable to local contexts. For instance, in Kenya, TVET programmes targeting rural populations have seen an increase in small-scale enterprise development, with beneficiaries leveraging their new skills to create sustainable livelihoods through agricultural businesses and small-scale manufacturing. These findings affirm the fact that TVET programmes have shown great potential in promoting self-employment and small-scale enterprises, particularly in rural and informal sectors. This indicates that the focus on adapting TVET initiatives to the unique needs of these communities remains critical in addressing unemployment and fostering economic development at the grassroots level.

### **Inferential Analysis**

To further ascertain the relationship between role of TVETs and reduction of unemployment rates, data were collected on graduation rates from the 10 sampled TVETs and the number of TVET graduates absorbed in the job market in Kiambu County for the past five years (2019-2023). Results are shown in Table 4;

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**Table 4: Number of TVET Graduates and Number of TVET Graduates Employed**

Graduation Rates from TVETs	Unemployment Rates among TVET Graduates
48.03	11.5
82.11	7.3
81.00	9.4
79.03	10.2
82.09	11.5
77.23	6.5
81.41	9.8
41.21	8.7
88.07	10.2
74.29	9.3

Source: Field Data (2024)

Table 4 shows that an increase in the graduation rates among students from TVETs has a corresponding decrease in the unemployment rates. This implies that, as more students acquire practical, job-ready skills, they become better equipped to meet the demands of various industries. TVET programmes focus on aligning education with market needs, producing a skilled workforce that fills critical gaps in sectors such as manufacturing, healthcare, and technology. This not only reduces unemployment but also drives economic growth by providing businesses with the talent they need to thrive, ultimately enhancing productivity and national competitiveness. The results in Table 4 were subjected to Pearson’s Product Moment Correlation Analysis and the results are shown in Table 5:

**Table 5: Relationship between Role of TVETs and Reduction in Unemployment Rates**

		Role of TVETs	Reduction in Unemployment Rates
Role of TVETs	Pearson Correlation	1	.750*
	Sig. (2-tailed)		.032
	N	8	8
Reduction in Unemployment Rates	Pearson Correlation	.750*	1
	Sig. (2-tailed)	.032	
	N	8	8

\*. Correlation is significant at the 0.05 level (2-tailed).

Table 5 shows a Pearson Product Moment Correlation Test Analysis which generated a correlation coefficient of  $r = 0.750$  with corresponding significant level (p-value) of 0.032 which was less than the predetermined level of significance, 0.05, that is,  $p\text{-value} = 0.032 < 0.05$ . This indicates that there is a significant influence of the role of TVETs on reduction of unemployment rates. These findings further affirm the fact that TVETs play a crucial role in reducing unemployment rates by equipping individuals with practical, job-ready skills tailored to labor market demands. As industries evolve, particularly in developing economies, the gap between educational qualifications and employment opportunities widens. TVETs bridge this gap by offering hands-on training in sectors like manufacturing, technology, healthcare, and construction, aligning with industry needs. By fostering entrepreneurship, TVETs also empower individuals to create their own businesses, contributing to job creation. Furthermore, TVET graduates often find employment faster than those from traditional education systems, as they possess the specific competencies sought by employers. In areas with high youth unemployment, such as Kiambu County in Kenya, TVETs have shown a positive impact by addressing skill shortages and reducing reliance on academic qualifications alone. Thus, TVETs are instrumental in enhancing employability, fostering innovation, and contributing to economic growth.

## SUMMARY OF FINDINGS AND CONCLUSIONS

From the study findings, there is an increasing rate of unemployment in Kiambu County for the last five years. To mitigate these challenges, TVETs have refocused the training to equip students with job-specific practical skills, entrepreneurship education, linkages and internship as well as integration of ICT and innovation. However, much is yet to be fully realized in improving status of unemployment rates.

## RECOMMENDATIONS

Based on the findings above, the study recommends that TVETS should collaborate closely with local and international industries to ensure that their training programmes align with current market demands. By continuously updating the curriculum to include emerging technologies, sector-specific skills, and soft skills like communication and problem-solving, TVET graduates will be

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better equipped to meet employers' needs. This alignment helps close the skills gap and increases employability, reducing unemployment rates, especially in regions where industry-specific expertise is in high demand.

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