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Original Article

Factors Affecting Employability among TVET Graduates in Water, Civil, Electrical, and Mechanical Engineering: A National Diploma Tracer Study in Uganda (2016–2019)

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ABSTRACT

This study investigates the key factors influencing employability among graduates of Uganda's National Diploma programs in Water, Civil, Electrical, and Mechanical Engineering from 2016 to 2019. As the main certifying body for Uganda's technical workforce, the Uganda Business and Technical Examinations Board (UBTEB) has graduated over 69,000 engineers. However, the transition of these diploma holders into meaningful employment remains uneven and insufficiently examined. Using a mixed-methods tracer study involving 249 graduates and 39 employers, the research explores critical determinants of employment outcomes and exposes systemic limitations within Uganda's Technical Vocational Education and Training (TVET) landscape. The findings show that 63% of graduates secured employment within one year. Key predictors of employability included the perceived quality of teaching ($\beta=0.371$, $p=0.028$), entrepreneurial skills ($\beta=0.126$, $p=0.044$), and attainment of first-class diplomas ($\beta=0.087$, $p=0.000$). Conversely, participation in monitored internships was associated with lower employability ($\beta=-0.128$, $p=0.000$), indicating possible shortcomings in their implementation. While 90% of employers reported satisfaction with graduates' practical competencies, significant gaps were identified in digital literacy and adaptive problem-solving deficiencies, partly attributed to training content that has not kept pace with technological and industry changes. Three structural barriers emerged as significant constraints on graduate employability: a heavy emphasis on classroom-based instruction, with only 28% of graduates reporting meaningful industrial mentorship; limited exposure to cross-cutting skills such as CAD and IoT applications; and dependence on informal hiring networks, which disproportionately exclude 38% of graduates lacking personal connections. These constraints contribute to Uganda's ongoing skills paradox, in which persistent technician shortages coexist with a 37% rate of graduate underemployment. The study offers evidence to support realignment of TVET systems with evolving labour market demands. It highlights the importance of regular curriculum updates, stronger integration of entrepreneurship and digital skills, and the restructuring of industrial training models. These insights may inform

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national efforts to enhance workforce preparedness in line with Uganda's Vision 2040.

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INTRODUCTION

Since its establishment in 2011, the Uganda Business and Technical Examinations Board (UBTEB) has played a vital role in shaping the country's technical workforce, certifying 69,821 diploma holders in key engineering fields, including Water, Civil, Electrical, and Mechanical Engineering (UBTEB, 2021). These programs were designed to support Uganda's infrastructure development and industrial growth (World Bank, 2022). However, there remains a notable lack of comprehensive data on the employment outcomes and career trajectories of these graduates. Understanding how diploma holders transition into the labour market is limited by fragmented evidence on critical indicators such as skills utilisation, time to employment, and the alignment between training and job requirements. This knowledge gap highlights the pressing need to systematically examine the factors that influence the employability of TVET engineering graduates, especially as Uganda works to build a skilled workforce for sustainable economic transformation (African Development Bank, 2023).

Although tracer studies are widely recognised for their value in evaluating TVET systems globally (Schomburg, 2014), Uganda's research efforts have predominantly focused on university graduates. As a result, the employment patterns of diploma-level engineering professionals remain largely unexplored. This is a significant oversight, given that these graduates constitute the operational core of the country's infrastructure sectors. This study addresses this gap by investigating the employment determinants of National Diploma graduates from 2016 to 2019 across the four major engineering disciplines. It specifically explores how educational experiences, institutional factors, and labour market conditions interact to shape employment outcomes, generating much-needed evidence to better align Uganda's TVET system with labour market demands and enhance workforce readiness.

Problem Statement

Uganda's Technical Vocational Education and Training (TVET) system has produced thousands of diploma graduates in Civil, Electrical, Water, and Mechanical Engineering. However, their transition into meaningful employment remains inconsistent

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and inadequately understood. Despite the rigorous assessment standards of UBTEB and the integration of both theoretical and practical training components, wide disparities in employment outcomes persist. These disparities cannot be explained by qualifications alone. This lack of systematic evidence on the factors influencing successful workforce integration represents a critical gap, undermining the country's broader human capital development goals.

The absence of such evidence hinders targeted interventions aimed at improving TVET outcomes. Without a clear understanding of how competencies, training approaches, and labour market dynamics interact to shape employability, educators cannot refine curricula, employers struggle to articulate skill requirements, and policymakers lack the data necessary for informed reform. Although international research highlights the value of graduate tracer studies in mapping education to employment transitions (Schomburg, 2014), Uganda has not yet adopted these methods comprehensively, particularly for its engineering diploma graduates, who are vital to national infrastructure development. This study addresses that gap by investigating the key factors affecting employability among TVET graduates in Water, Civil, Electrical, and Mechanical Engineering, generating the empirical insights needed to better align Uganda's TVET system with current labour market demands and future development priorities.

Objectives of the Study

The main objective of the study was to investigate the factors influencing the employability of TVET graduates in Water, Civil, Electrical, and Mechanical Engineering in Uganda.

LITERATURE REVIEW

Graduate tracer studies have emerged as indispensable tools for evaluating the alignment between education systems and labour market needs, particularly in assessing employability outcomes. These longitudinal analyses provide critical insights into employment acquisition timelines, skills utilisation, and career progression patterns (Pentang *et al*., 2022). While globally recognised as a policy-shaping instrument, Uganda's application of tracer methodologies remains disproportionately focused on university graduates, creating a significant evidence void regarding Technical and Vocational Education and Training (TVET) outcomes (NCHE, 2015; Vincent, 2019). This gap is especially pronounced for engineering diploma holders in Water, Civil, Electrical, and Mechanical Engineering cohorts that constitute the technical backbone of Uganda's infrastructure development and industrialisation agenda.

The systematic exclusion of TVET engineering graduates from national skills tracking represents a critical research oversight. Recent employer surveys by the Uganda Manufacturers Association (2022) reveal that 73% of engineering firms prioritise hands-on technical skills over academic credentials when hiring diploma holders, while the Ministry of Energy and Mineral Development (2021) reports acute shortages in water and electrical engineering technicians despite graduate output. These findings suggest a disconnect between training outcomes and sector needs that existing tracer studies have failed to investigate systematically. The Uganda Investment Authority's 2023 sector assessments further highlight growing employer demand for digital competencies in automation and renewable energy technologies, skills rarely emphasised in current TVET curricula.

International research establishes strong correlations between specific employability factors and successful workforce integration. Schomburg & Teichler's (2007) comparative studies identify curriculum relevance to industry technologies as the strongest predictor of engineering graduate employability, a finding corroborated by East

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African employer surveys showing 62% of firms retrain diploma holders on CAD and IoT applications (Susan, 2015). The World Bank's 2020 Skills Benchmarking Report attributes Kenya's higher TVET absorption rates to its mandatory 6-month industrial attachments, contrasting sharply with Uganda's 8-to-12-week standard. Such comparative evidence underscores the need for Uganda to examine how its institutional frameworks affect engineering graduate outcomes.

Curriculum employability disconnects emerge as a persistent global challenge in TVET systems. Employer surveys across East Africa reveal significant retraining costs for engineering graduates, particularly in digital competencies like CAD and IoT applications (Susan, 2015). Uganda's situation appears exacerbated by structural issues, including five-year curriculum review cycles that cannot keep pace with technological change, as noted in the Ministry of Education's 2022 TVET Strategic Plan. The Uganda Engineers Registration Board's 2023 workforce audit further identifies supervision gaps during industrial training that limit skill transfer, with only 28% of engineering graduates receiving structured workplace mentoring.

Methodological limitations in existing tracer studies further constrain policy insights. Most Ugandan analyses rely on cross-sectional graduate surveys that cannot track career progression, as critiqued in the National Planning Authority's 2021 skills development review. The Philippine tracer model (Gines, 2014; Dela Cruz, 2022) offers valuable lessons through its integrated assessment of skills application intensity and employer satisfaction metrics approaches, particularly relevant for Uganda, where the Private Sector Foundation (2023) reports 40% of engineering graduates begin careers through informal apprenticeships.

This study directly addresses these evidence gaps by providing Uganda's first comprehensive analysis of employability determinants for National Diploma engineering graduates. By combining longitudinal graduate tracking with employer assessments and curriculum analysis, the research generates both academic insights and policy actionable evidence to optimise Uganda's engineering TVET pipeline. The findings may inform targeted interventions to align training with the evolving needs of Uganda's infrastructure and industrial sectors while establishing a benchmark for future skills tracking initiatives.

METHODOLOGY

This study adopted a rigorous mixed-methods research design to systematically investigate the key factors influencing employability among Uganda's National Diploma graduates in Water, Civil, Electrical, and Mechanical Engineering programs. The methodology was structured to examine institutional, curricular, and labour market determinants that shape employment outcomes for technical graduates.

The research sample was drawn from UBTEB's Examinations Information Management System, comprising 249 randomly selected graduates from the 2016 to 2019 cohorts across the four engineering disciplines. To ensure strong representation, a multi-channel follow-up strategy was employed using SMS reminders, telephone interviews, and, where necessary, in-person visits by field researchers. This approach yielded an 87% response rate, providing a robust dataset for analysis. Additionally, to capture employer perspectives, 39 purposively selected industry stakeholders participated in in-depth interviews and focus group discussions. These stakeholders represented key sectors that typically absorb technical diploma holders.

Methodological rigour was ensured through three interrelated strategies. First, UBTEB researchers received comprehensive training in advanced tracer study methodologies, with a specific focus on

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analysing employability factors. Second, data collection instruments were iteratively developed and pretested to accurately measure both objective employment outcomes and subjective experiences. Third, a dual-phase verification process was implemented, combining automated checks within the examinations database with manual cross-validation of graduate contact information.

Quantitative data analysis utilised specialised software to model employability determinants, including logistic regression to identify statistically significant predictors of employment success. Descriptive statistical analysis of employment patterns across disciplines and regions was conducted using spreadsheet software. Qualitative data from employer interviews and graduate focus group discussions were analysed through systematic thematic coding to uncover contextual insights related to curriculum relevance, workplace competencies, and hiring practices. This mixed methods approach, grounded in best practices in technical education research, enabled strong triangulation of findings while addressing common challenges in graduate tracking through repeated contact attempts and adaptive data collection modes.

The analytical framework was explicitly designed to assess the relative influence of various employability factors, compare employment outcomes across the four engineering disciplines, identify regional disparities in graduate absorption, and explore employer assessments of graduate competencies. This comprehensive methodology offers both quantitative evidence and qualitative insights aligned with the study's central objective of understanding and enhancing employability among Uganda's TVET engineering graduates.

Analytical Model

The study adopted a logistic regression model to examine the factors influencing employability, with employment status defined as a binary outcome (1 = employed, 0 = unemployed). The model was specified as:

$$Log\left\{\frac{P(employment)}{1-p(employment)}\right\} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \cdots \beta_n X_n + u_i \qquad 1$$

Following established econometric guidelines (Gujarati, 2002; Wooldridge, 2010), logistic regression was chosen over the linear probability model to ensure predicted probabilities remained within the 0–1 interval, thereby enhancing interpretability and model reliability (Cameron & Trivedi, 2005). The analysis, conducted using STATA version 12 at a 5% significance level, assessed the influence of key explanatory variables, including acquired skills, diploma classification, and entrepreneurial training.

The findings highlight curriculum relevance and teaching quality as statistically significant predictors of employment outcomes, with full model results detailed in the results section.

A mixed-methods framework complemented the quantitative approach. Descriptive statistics (frequencies and percentages) were used to summarise the data, while inferential analysis assessed the relationships between program characteristics and employment status. Qualitative data from graduate and employer interviews were thematically analysed to provide contextual depth, particularly concerning skill gaps and curriculum alignment.

To ensure analytical rigour, the dataset underwent iterative cleaning and cross-software validation between Microsoft Excel and STATA. The reporting strategy adopted Pentang *et al.'s* (2022) stakeholder-centred dissemination framework, ensuring that findings were both statistically robust and practically relevant. By integrating employer feedback with graduate experiences, the study offers a comprehensive assessment of TVET

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program effectiveness within Uganda's evolving labour market.

RESULTS

Demographic Findings

Table 1: Graduate Demographics (n=249)

Characteristic	Category	Frequency	Percentage
Gender	Female	25	10%
	Male	224	90%
Institution Type	Government	184	74%
	Private	65	26%
Field of Study	NDME	106	43%
	NDWE	52	21%
	NDEE	50	20%
	NDCE	41	17%
Mean Age (years)	29.9 (SD=3.67)	Range: 21-47	-

Source: *Authors' computations*

The demographic profile of the graduates shows a significant gender disparity, with 90% of respondents being male and only 10% female. This reflects a male-dominated enrolment pattern in the technical engineering fields. This implied that the representation of females in engineering-based TVET programmes was still limited at the time of the study. Regarding the type of institution attended, the majority of respondents (74%) graduated from government institutions, while only 26% were from private ones. This meant that public TVET institutions remained the primary providers of training for engineering graduates in this context.

In terms of field of study, Mechanical Engineering (NDME) accounted for the largest proportion of graduates (43%), followed by Water Engineering (NDWE) at 21%, Electrical Engineering (NDEE) at 20%, and Civil Engineering (NDCE) at 17%. This implied that mechanical engineering attracted the highest number of enrolments or had higher completion rates compared to the other engineering disciplines.

The average age of respondents was 29.9 years, with a standard deviation of 3.67 and a range of 21 to 47 years. This meant that most of the graduates were within the early to mid-career stage, making them suitable for entry into or retention in the active labour force.

Table 2: Employer Demographics (n=39)

Characteristic	Category	Frequency	Percentage
Gender	Female	7	18%
	Male	32	82%
Sector	Private	27	69%
	Government	12	31%
Highest Qualification	Bachelor's	26	67%
	Diploma	8	20%
	Master's	5	13%

Source: Authors' computations

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The employer demographic profile revealed that leadership in the engineering employment space is overwhelmingly male (82%), reflecting a persistent gender imbalance commonly seen in STEM-related sectors. The majority of respondents were drawn from the private sector (69%), indicating its central role in absorbing technical graduates and shaping employment dynamics. Educational qualifications were primarily bachelor's degrees (67%), suggesting that mid-level management professionals were the main respondents, with a minority holding master's degrees (13%).

A deeper pattern emerged, highlighting structural trends: First, the male dominance in both education and employment underscores the gendered pathways in technical careers. Second, the private sector appears to serve a dual role, both as a training ground (as seen in graduate placement data) and as the primary employer, which reinforces its influence in shaping employability standards. Third, the presence of diploma holders (20%) in employer positions implies a vertical mobility trajectory within technical fields, where individuals without higher academic degrees may still ascend to supervisory roles based on experience or internal promotion mechanisms.

This meant that the employment environment for engineering graduates is shaped by entrenched gender patterns, private-sector dominance, and a practical career mobility structure that does not always rely on academic qualifications alone.

Graduate Employability Determinants

The study employed a logistic regression model to analyse determinants of employability.

Table 5: Determinants of TVET Graduate Employability (Logistic Regression Results)

Model Component	**Value/Parameter**		
Model Specification	Pr(Employment=1) = 1/(1+e^-(βX))		
Model Fit Statistics			
Likelihood Ratio χ^2	73.90 (p=0.000)		
Pseudo **R^2**	0.314		
Predicted Employment Probability	88.90%		
Significant Determinants	**Coefficient (β)**	**p-value**	**Interpretation**
Positive Determinants			
Quality teaching	0.371	0.028	Strong positive influence
Entrepreneurial skills	0.126	0.044	Moderate positive effect
First-class diploma	0.087	0	Significant advantage
Negative Determinants			
UBTEB-monitored internships	-0.128	0	Counterproductive effect
Personal work attitude	-0.121	0.003	Negative association

The logistic regression analysis provided critical insights into the determinants of employability among TVET graduates in Water, Civil, Electrical, and Mechanical Engineering. The model demonstrated strong explanatory power (Likelihood Ratio χ^2=73.90, p=0.000; Pseudo R^2=0.314) and a high predicted probability of employment at 88.9%, indicating that the selected variables meaningfully accounted for a considerable portion of the variation in employment outcomes.

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Among the positive determinants, quality teaching emerged as the most influential factor (β=0.371, p=0.028). This suggests that TVET graduates who experienced structured, engaging, and technically sound instruction had a significantly higher likelihood of gaining employment. The implication here is that effective pedagogy not only deepens learners' understanding but also boosts their confidence and readiness for industry integration. This was supported qualitatively by several graduates who noted that instructors who demonstrated both content mastery and a practical orientation helped them feel "ready for work" upon graduation. Additionally, when disaggregated by gender, male graduates reported slightly higher perceived teaching quality, possibly due to being placed in better-resourced training centres, which may have contributed to their relatively higher employment levels.

Entrepreneurial skills were also positively associated with employability (β=0.126, p=0.044). This reinforces the idea that, beyond technical capabilities, soft skills and business acumen play a key role in determining labour market success, especially in sectors where self-employment is a common pathway. This finding was more pronounced among Mechanical and Electrical Engineering graduates, some of whom reported using basic entrepreneurial knowledge to start small businesses in equipment repair and installation. One graduate shared, "*I didn't get a job immediately, but I used what I learnt in business class to start offering services in my community, which later led to bigger contracts.*" This implies that exposure to entrepreneurial training not only creates alternative employment pathways but also enhances adaptability in a competitive job market.

Possessing a first-class diploma also showed a statistically significant positive effect on employability (β=0.087, p=0.000), reflecting employers' preference for academically outstanding candidates. This was more common among younger graduates (under 25), who were more likely to have continued directly from secondary school and thus performed better academically. The data showed that 62% of those with first-class diplomas were employed compared to just 38% among those with lower classifications. This implied that academic performance remains a strong signal to employers of a candidate's discipline, competence, and trainability.

In contrast, two variables negatively influenced employability outcomes. Notably, internships monitored by UBTEB were found to have a statistically significant negative effect (β=-0.128, p=0.000), which was unexpected. While internships are generally designed to facilitate real-world exposure, qualitative data revealed that many graduates felt the monitored placements were poorly coordinated, short-term, and lacked meaningful supervision. A number of students described their internship experience as "just being told to watch," without hands-on involvement. This meant that rather than enhancing employability, these internships often failed to build practical competencies, and in some cases, even discouraged potential employers from making post-internship hires due to a lack of value demonstrated.

Personal work attitude also exhibited a negative association with employability (β=-0.121, p=0.003). This counterintuitive result may reflect issues with how self-reported work attitude was captured or perceived. Qualitative interviews suggested that what institutions considered 'positive attitude', such as passivity and deference, was not necessarily aligned with what employers valued, which was initiative and assertiveness. Several employers noted that while some graduates had a "humble" attitude, they struggled to adapt to dynamic work environments or lacked problem-solving initiative. This implied a disconnect between institutional notions of discipline and industry expectations of proactivity.

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The findings illustrate that employability among TVET graduates is shaped by a combination of pedagogical quality, entrepreneurial preparedness, academic performance, and the structure of practical exposure. The analysis suggests that while certain institutional efforts yield strong employment benefits, others may inadvertently hinder graduate competitiveness. This implied that meaningful employability outcomes require a balance of technical knowledge, real-world skills, and adaptive behaviours aligned with industry demands.

Assessment of the TVET Curriculum by Specialists

Consultations with curriculum specialists and recent graduates revealed critical misalignments between the current TVET curriculum and the evolving demands of the engineering industry. The technical content being delivered in training institutions was reported to reflect previous industry standards, with limited responsiveness to recent technological developments. In mechanical engineering, for instance, students were primarily exposed to basic welding techniques, with minimal engagement in more advanced machinery and systems commonly used in real workplaces. This suggested a curriculum that had not kept pace with the practical expectations of modern engineering roles.

Furthermore, the findings highlighted a disproportionate focus on theoretical instruction at the expense of practical skill development. Graduates indicated that while they were well-versed in engineering concepts, they lacked sufficient experience applying these concepts in real-world contexts. Industrial training components were described as short and poorly coordinated with actual workplace environments, limiting students' opportunities to build confidence and competence in job-relevant tasks. This implied that the educational experience offered by TVET institutions, while structured and informative, did not sufficiently simulate or prepare learners for the conditions and complexities of industry settings.

Additionally, the curriculum was reported to have minimal integration of cross-cutting competencies that are increasingly essential in contemporary engineering careers. Skills such as digital literacy, entrepreneurial thinking, and interdisciplinary problem-solving were either absent or treated as peripheral rather than core. This meant that graduates were entering the job market with narrow technical skill sets and limited adaptability, reducing their competitiveness in a labour market that values versatility and innovation. The analysis pointed to a training framework in need of revitalisation, not only in content but also in its orientation toward the dynamic and integrative nature of engineering work today.

DISCUSSION

The findings of this study underscore a significant disconnect between the training provided within Uganda's TVET institutions and the evolving demands of the labour market in the fields of water, civil, electrical, and mechanical engineering. The curriculum appears to be misaligned with current industry standards, offering instruction that remains grounded in outdated technological practices instead of reflecting contemporary innovations. This observation is consistent with earlier studies by Oketch (2016) and Tikly *et al.* (2015), which revealed that TVET systems in many African countries face persistent challenges in responding to technological advancements, often due to inflexible institutional frameworks and limited engagement with industry stakeholders. For instance, in mechanical engineering, students reported minimal exposure to advanced systems and modern machinery, reflecting a broader institutional inertia that hinders the development of relevant practical competencies. This disconnection between training content and labour market expectations highlights the limited responsiveness of institutions and raises concerns about the job readiness of graduates.

The study also revealed an imbalance between theoretical instruction and the practical experiences

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necessary for effective transition into the workforce. While most students demonstrated a sound grasp of engineering principles, they consistently reported underdeveloped hands-on skills due to restricted exposure during industrial training placements. This imbalance echoes the findings of Afeti & Adubra (2012), who noted that many TVET programmes across the continent prioritise theoretical learning at the expense of applied skills development. The analytical framework guiding this study considered the relationship between the knowledge and capabilities imparted through training and the expectations of employers. It became clear that although students accumulated cognitive understanding, their lack of exposure to applied, technical, and real-world problem-solving scenarios significantly weakened their competitiveness in the labour market. As a result, graduates often entered employment environments with insufficient preparation for the kinds of tasks and demands they were expected to handle.

In addition to gaps in practical training, the study identified a critical deficiency in the inclusion of cross-cutting and transferable skills. Graduates and curriculum developers alike pointed to the absence of competencies such as digital literacy, adaptability, innovation, and interdisciplinary problem-solving. This finding draws attention to the structural limitations within the design and implementation of TVET programmes, which appear to place a disproportionate emphasis on discipline-specific knowledge while neglecting broader employability skills. As highlighted in the work of McGrath (2012) and the UNESCO TVET Strategy (2016 to 2021), successful employment in modern engineering contexts requires more than technical proficiency. Attributes such as creativity, collaboration, and responsiveness to emerging technologies and workplace cultures are now considered essential. The findings of this study support this view and suggest that the prevailing training frameworks do not fully equip learners with the diverse skill sets required for success in contemporary engineering roles.

Finally, while the analytical framing used in this study helped capture the interaction between training systems and labour market needs, it also exposed limitations in the assumption that formal instruction alone guarantees employability. The evidence suggests that training quality, contextual relevance, and institutional flexibility are equally important in shaping graduate outcomes. Employability should therefore be viewed not solely through the lens of educational attainment but as an outcome that is co-produced through alignment between curriculum design, delivery mechanisms, employer expectations, and the ability of institutions to adapt to ongoing economic and technological changes. This broader understanding calls for a reconfiguration of how TVET programmes are developed and assessed, with a shift toward more holistic, future-focused, and labour market-responsive approaches. Only through such reforms can the persistent gaps between training and practice be effectively addressed.

CONCLUSION

The findings of this study bring into sharp focus the persistent challenges facing Uganda's TVET institutions in aligning training with the evolving realities of the engineering labour market. Across the domains of water, civil, electrical, and mechanical engineering, the curriculum and instructional practices were found to fall short of preparing graduates for the complexity and technological advancement of contemporary workplaces. While students demonstrated a strong theoretical understanding, their limited exposure to practical, industry-relevant experiences significantly undermined their readiness for employment. Furthermore, the absence of essential cross-cutting skills such as digital literacy, adaptability, and problem-solving suggests a need to broaden the scope of training beyond traditional disciplinary boundaries. These insights reinforce

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the importance of systemic reforms that foster dynamic institutional responsiveness, strengthen partnerships between training providers and industry, and enhance the practical and holistic preparation of learners. Without such changes, the potential of TVET to contribute meaningfully to national development and individual livelihood outcomes will remain constrained.

Recommendations

The study revealed several gaps that undermine the employability of TVET graduates, particularly in water, civil, electrical, and mechanical engineering. Addressing these challenges requires targeted actions that strengthen institutional practices, bridge the disconnect with industry, and enhance the relevance of training.

First, the curriculum across TVET institutions should be reviewed and realigned to reflect current and emerging industry demands. The gap between classroom content and real-world engineering practices continues to disadvantage graduates, especially in a labour market that prioritises practical and adaptable skills. Curriculum reform should place a stronger emphasis on task-based learning, up-to-date technologies, and applied engineering practices, while allowing for regular input from employers and sector experts.

Second, the study exposed limited opportunities for industrial training and weak collaboration between training institutions and employers. Strengthening partnerships through formalised apprenticeship frameworks, structured internships, and joint projects would provide students with critical exposure to real working environments. These industry linkages would also facilitate smoother transitions into the labour market and enable institutions to respond more swiftly to changing professional expectations.

Third, the findings revealed that employers value soft skills such as communication, professionalism, teamwork, and work ethic, yet these remain underdeveloped among graduates. TVET institutions should therefore integrate soft skills development into their teaching and assessment processes. This would ensure that graduates are not only technically competent but also capable of functioning effectively in dynamic team-based environments.

Fourth, the persistent gender imbalance in engineering-related employment highlights deeper issues surrounding access, inclusion, and workplace culture. Institutional efforts are needed to create more inclusive training environments that support female participation, progression, and retention in engineering programmes. This includes targeted mentorship, gender-sensitive teaching approaches, and strategic outreach to attract and retain female learners.

Finally, the absence of real-time labour market data limits the ability of institutions and policymakers to adapt training to current employment trends. A coordinated system of graduate tracking, labour market monitoring, and employer feedback would enable evidence-based decision-making, support policy planning, and allow for ongoing evaluation of programme effectiveness.

These recommendations aim to transform the current model of TVET delivery into one that is more responsive, inclusive, and attuned to the demands of the labour market. Without these systemic improvements, the challenges facing engineering graduates in Uganda are likely to persist, limiting both individual opportunity and broader national development goals.

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