

Student Experience and Programme Quality as Determinants of Student Satisfaction and Employability in Technical and Vocational Education and Training Institutions: Evidence from the Technical University of Mombasa, Kenya

Anwar H. Ahmed*

School of Business, Technical University of Mombasa, Kenya

**Corresponding Author*

William Kingi

School of Business, Technical University of Mombasa, Kenya

Abstract

Technical and Vocational Education and Training (TVET) is widely regarded as a core mechanism for building a skilled labour force that can sustain industrial expansion, innovation, and long-term economic development. In Kenya, reform efforts continue, yet there remains limited empirical work showing how multiple aspects of student experience, taken together, relate to student satisfaction and perceived employability in TVET settings. This study assessed how teaching quality and curriculum relevance, learning resources and institutional facilities, student support services and industry exposure, financial constraints, and employability preparedness relate to overall student satisfaction at the Technical University of Mombasa (TUM-TVET Institute). A descriptive cross-sectional design was applied through a mixed-methods strategy, with quantitative data providing the main evidence and qualitative responses offering interpretive depth. Using a structured questionnaire, data were collected from 248 students and analysed through descriptive statistics, thematic analysis, and multiple linear regression. Results indicate generally favourable views of teaching quality, curriculum relevance, institutional standing, and employability preparedness. At the same time, respondents pointed to clear weaknesses in practical training, connections with industry, student support provision, ICT capacity, and financial support. In the regression model, employability preparedness ($\beta = 0.218$, $p < 0.001$), learning resources and institutional facilities ($\beta = 0.102$, $p = 0.011$), and student support services and industry exposure ($\beta = 0.066$, $p = 0.031$) emerged as significant predictors of overall student satisfaction. Teaching quality and curriculum relevance, along with financial constraints, did not show statistically significant independent effects once other factors were controlled. The study therefore argues that satisfaction in TVET settings is driven mainly by employability confidence, access to adequate learning resources, and effective institutional support, more than by classroom teaching alone. Strengthening industry linkages, widening experiential learning, upgrading infrastructure, improving student support systems, and embedding continuous quality improvement are recommended to raise educational quality and graduate employability across Kenya's TVET sector.

Key Words: Technical and Vocational Education and Training (TVET); student experience; programme quality; student satisfaction; employability; curriculum relevance; higher education; quality assurance; Kenya; Technical University of Mombasa

Doi: 10.61250/ssmj/v1.i4.1

1. Introduction

TVET has increasingly assumed a central role in workforce development, especially as economies seek higher productivity, stronger industrial performance, and greater technological capability. In many contexts, both high-income and low- and middle-income countries treat TVET as

a practical route for reducing youth unemployment, narrowing skills mismatches, and supporting economic competitiveness by ensuring that learners acquire competencies aligned with labour market shifts (UNESCO, 2021; OECD, 2023). With digital transformation and automation altering occupational structures, higher education institutions face rising expectations to produce graduates who combine technical expertise with transferable capacities, including critical thinking, communication, problem-solving, and adaptability (ILO, 2022).

Within Kenya, TVET is positioned as a strategic contributor to Vision 2030, the Bottom-Up Economic Transformation Agenda (BETA), and Sustainable Development Goal 4, which stresses inclusive and equitable quality education. Recent reforms have focused on rolling out Competency-Based Education and Training (CBET), building stronger institution–industry ties, widening digital learning, and improving graduate employability. Still, many institutions contend with limited practical training spaces, weak industry collaboration, inadequate learning inputs, and financial pressures on learners. Each of these conditions can affect student experience, satisfaction, academic attainment, and employment prospects (World Bank, 2022; African Development Bank, 2020).

Student experience has also gained prominence as a marker of institutional quality and educational effectiveness. It captures how learners perceive teaching, curriculum relevance, resources, support services, campus conditions, industry exposure, and readiness for work. When experiences are positive, students tend to show higher engagement, improved outcomes, stronger attachment to institutions, and better employability prospects. Negative experiences, in contrast, are often linked to disengagement, weak performance, and dropout risk (Harvey, 2011; Kahu & Nelson, 2018).

The TUM-TVET Institute operates within a regional economy that is changing quickly, driven by maritime transport, logistics, tourism, manufacturing, digital technologies, and the wider blue economy. Such expansion increases the demand for graduates whose skills fit workplace realities and industry standards. For that reason, understanding student perceptions of programme quality is necessary if institutional offerings are to remain responsive to emerging opportunities and employer needs. Against this context, the present study reviews key dimensions of student experience and programme quality at TUM-TVET, covering teaching and learning, curriculum relevance, learning resources, student support, industry exposure, employability preparedness, financial constraints, and overall satisfaction. The evidence produced is intended to inform quality improvement, curriculum refinement, and policy directions that support the strengthening of TVET in Kenya.

1.1 Background

Across the global policy landscape, TVET is increasingly framed as a driver of economic development, industrial competitiveness, and workforce readiness. Rapid advances in technology, alongside automation and shifting labour market requirements, have intensified calls for education systems that build practical occupational competence while also developing transferable skills. Organisations such as UNESCO, the ILO, the OECD, and the World Bank continue to press for TVET systems that remain closely tied to industry expectations and broader sustainable development priorities (ILO, 2022; OECD, 2023; UNESCO, 2021). Also, attention has expanded toward student learning experience, given its direct connection to quality, graduate outcomes, and institutional performance (UNEVOC, 2022).

Kenya has introduced major changes in the TVET sector through policy reform, institutional growth, CBET, and the Kenya National Qualifications Framework (KNQF). These reforms aim to improve programme standards, boost employability, and tighten alignment between training and labour market needs. Even with these advances, many institutions continue to experience constraints

tied to training equipment, limited industry participation, restricted budgets, and weak student support services, conditions that can reduce the quality of student experiences (World Bank, 2022).

In Mombasa County, growth in maritime transport, logistics, tourism, manufacturing, renewable energy, and the blue economy has intensified demand for technically proficient graduates. As a leading regional provider, TUM carries a key mandate in preparing graduates with relevant knowledge, practical abilities, and professional competence for these sectors. Reviewing how students assess programme quality and their training experience therefore provides useful evidence for institutional improvements, curriculum updates, and policy decisions designed to strengthen TVET relevance and performance.

1.2 Research Objective

General Objective

To evaluate student experience and programme quality at TUM-TVET Institute and determine their influence on student satisfaction and perceived employability.

Specific Objectives

- i. To examine students' perceptions of teaching quality and curriculum relevance at TUM-TVET (X_1) on the level of overall student satisfaction with programme quality and institutional services (Y).
- ii. To assess the adequacy of learning resources and institutional facilities available to students (X_2) on the level of overall student satisfaction with programme quality and institutional services (Y).
- iii. To evaluate the effectiveness of academic support services, career guidance, and industry exposure (X_3) the level of overall student satisfaction with programme quality and institutional services (Y).
- iv. To examine the influence of financial challenges on students' academic experiences (X_4) the level of overall student satisfaction with programme quality and institutional services (Y).
- v. To determine students' perceptions of employability preparedness following completion of their programmes (X_5) the level of overall student satisfaction with programme quality and institutional services (Y).

1.3 Research Hypothesis

The null hypotheses were stated as follows:

H₀₁: There is no statistically significant influence of teaching quality and curriculum relevance (X_1) on the level of overall student satisfaction with programme quality and institutional services (Y) at TUM-TVET.

H₀₂: There is no statistically significant influence of learning resources and institutional facilities (X_2) on the level of overall student satisfaction with programme quality and institutional services (Y) at TUM-TVET.

H₀₃: There is no statistically significant influence of academic support services, career guidance, and industry exposure (X_3) on the level of overall student satisfaction with programme quality and institutional services (Y) at TUM-TVET.

- H₀₄: There is no statistically significant influence of financial challenges (X₄) on the level of overall student satisfaction with programme quality and institutional services (Y) at TUM-TVET.
- H₀₅: There is no statistically significant influence of students' perceptions of employability preparedness (X₅) on the level of overall student satisfaction with programme quality and institutional services (Y) at TUM-TVET.

2. Literature Review and Conceptual Framework

Student experience is now widely used as a proxy for educational quality in higher education and TVET settings. It reflects student judgements of teaching effectiveness, curriculum relevance, resource availability, institutional support, employability preparation, and learning conditions. Unlike quality measures that depend primarily on grades and completion, student experience offers a broader view of how institutional practices shape learning, satisfaction, and outcomes. Institutions increasingly rely on student experience data for quality assurance, curriculum revision, and planning, given the link between positive experiences, sustained engagement, continuation, and employability (Harvey, 2011; UNESCO, 2021).

The conceptual framework proposes that student satisfaction is shaped by five dimensions: teaching quality and curriculum relevance, learning resources and facilities, student support and industry exposure, financial challenges, and employability preparedness. Improvements in these areas are expected to strengthen educational experience, satisfaction, and employability perceptions. Weaknesses in any dimension are expected to reduce satisfaction and weaken TVET effectiveness. The framework therefore guided hypothesis testing through multiple regression.

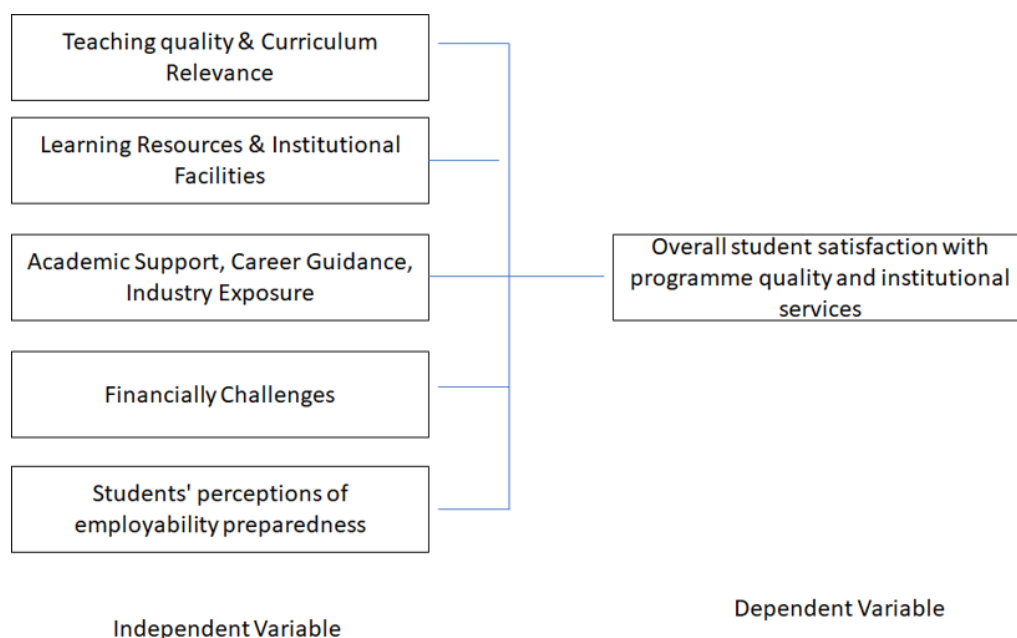


Figure 1: Conceptual framework

2.1 Teaching Quality and Curriculum Relevance

Teaching quality and curriculum relevance form the first independent variable. Ramsden (2003) describes effective teaching as extending beyond content transmission to include preparation, interactive methods, timely feedback, and support for active learning. Biggs and Tang (2011) also stress that quality learning is more likely when teaching activities, learning outcomes, and assessment are constructively aligned. In TVET, curriculum relevance is equally central because programmes are expected to develop competencies tied to present labour market demands. The construct was measured through students' ratings of lecturer readiness, interactive delivery, technical competence, curriculum alignment with industry, adequacy of practical learning, inclusion of digital skills, frequency of hands-on sessions, and programme relevance for employment. Together, these items assessed whether teaching and curriculum implementation support professional practice and continued learning.

2.2 Learning Resources and Institutional Facilities

Learning resources and institutional facilities represent the second independent variable. The quality of both physical and digital learning spaces influences how effectively students acquire practical competence and participate in academic activities. UNESCO (2021) points out that modern TVET requires workshops, laboratories, libraries, classrooms, ICT, and reliable internet to sustain competency-based learning. The World Bank (2022) similarly links investment in training infrastructure with improved skill development and graduate readiness. Here, the construct included classroom adequacy, workshop and laboratory capacity, library services, ICT provision, equipment modernity, and internet reliability. These factors jointly shape experiential learning conditions and student confidence in programme quality.

2.3 Student Support Services, Career Guidance and Industry Exposure

Student support services, career guidance, and industry exposure constitute the third independent variable. Tinto's (1993) Student Integration Theory argues that success is more likely when learners receive sustained academic and social support. Astin's (1993) Student Involvement Theory adds that meaningful engagement in institutional activities improves learning outcomes and satisfaction. For TVET, exposure to industry through attachments, internships, guest talks, mentorship, and field visits connects classroom content with workplace expectations (Jackson, 2015). This construct was measured through perceived access to academic support, career guidance availability, opportunities for industrial placement, and contact with industry professionals. Strong support helps improve academic experiences and eases school-to-work transitions.

2.4 Financial Challenges

Financial challenges, the fourth independent variable, affect participation and performance by influencing fee payment, access to learning materials, transport, and practical activities. Johnstone (2018) identifies financial pressure as a major contributor to delayed completion and attrition. Financial challenges were measured through sources of funding, awareness of support options, financial difficulties faced, effects on performance, household capacity, and barriers to bursaries, scholarships, and HELB support. These items capture how financial conditions shape experiences and satisfaction.

2.5 Employability Preparedness

Employability preparedness is the fifth independent variable. Yorke (2006) frames employability as an integration of knowledge, technical competence, transferable skills, and personal attributes that support obtaining and maintaining meaningful work. Current TVET systems give emphasis to practical, digital, entrepreneurial, communication, leadership, teamwork, and problem-solving abilities aligned with employer expectations (OECD, 2023). The study measured employability preparedness using perceptions of skills gained, programme readiness for work, self-rated workplace preparedness, and areas needing further development. These measures reflect students' confidence in competing in the labour market.

2.6 Overall Student Satisfaction

Overall student satisfaction, the dependent variable, captures students' overall judgement of their educational experience. Elliott and Shin (2002) define satisfaction as the extent to which educational services meet or exceed expectations. It is commonly treated as an outcome of teaching quality, curriculum relevance, resources, support services, and learning conditions. Satisfaction was measured through programme satisfaction, satisfaction with learning conditions, perceived academic support, institutional reputation, and willingness to recommend the institution.

2.7 Research Gap

While educational quality and satisfaction are well studied in university settings, fewer empirical studies in Kenya have examined TVET student experience using multidimensional constructs that simultaneously capture teaching, curriculum relevance, resources, industry exposure, employability preparation, financial constraints, institutional support, and satisfaction. Much of the existing evidence isolates issues such as employability, curriculum implementation, or infrastructure, leaving the combined influence of these factors less clear. Evidence from coastal Kenya remains especially limited, including research focused on TUM, despite its key role in preparing human capital for maritime, logistics, tourism, and manufacturing. The study responds by presenting an institution-wide assessment of student experience and programme quality using both quantitative and qualitative evidence, contributing to TVET quality assurance literature while offering recommendations for institutional improvement, policy development, and curriculum enhancement.

3. Methodology

3.1 Research Design

A descriptive cross-sectional survey design was adopted through a mixed-methods approach. Quantitative results were treated as the main evidence base, and open-ended responses were analysed to complement and clarify statistical patterns. Cross-sectional designs allow data collection at a single point, offering a snapshot of prevailing conditions without manipulating the setting, a common approach in educational studies examining attitudes and relationships among variables (Creswell & Creswell, 2023). The study examined how multiple dimensions of experience and programme quality relate to overall satisfaction in a TVET institution. Given that these dimensions are multi-layered, combining numeric evidence with student narratives strengthened the findings. Quantitative data offered measurable patterns in perceptions of teaching quality, curriculum relevance, resources, support, employability preparedness, and financial constraints. Qualitative responses added

explanatory context, improving interpretation of statistical results. Such integration is increasingly advised in educational evaluation, as it yields a more complete picture than relying on a single approach (Saunders et al., 2023).

3.2 Study Area and Population

The research took place at TUM-TVET Institute, a public institution offering TVET programmes across Engineering, Business and Management, ICT, Maritime Studies, Hospitality and Tourism, Applied Sciences, and related areas. Located within Kenya's coastal region, TUM-TVET contributes to workforce development in maritime transport, logistics, manufacturing, tourism, renewable energy, and the blue economy. The target population comprised all registered, academically active students during the data collection period, including those pursuing Diploma, Certificate, Craft Certificate, Artisan, and related vocational qualifications. Only active students were included to ensure that opinions reflected current programme delivery and services. Students who had graduated, deferred, withdrawn, or were inactive were excluded.

3.3 Sampling Procedure and Sample Size

A quota-controlled proportional strategy combined with systematic random sampling was applied to obtain representation across programme areas and study levels. Proportional allocation ensured each area contributed participants in line with enrolment size, reducing sampling bias. Quotas also ensured representation from Diploma, Certificate, Craft Certificate, and Artisan programmes, supporting comparison across levels. The process began with verified enrolment lists from institutional records. After selecting a random starting point, every k th student was chosen until the required numbers within each quota cell were reached. Where selected students were unavailable or declined, replacements were drawn within the same programme area and level to preserve proportional balance. The initial plan proposed at least 160 respondents plus a reserve for non-response, yet fieldwork produced 248 fully completed questionnaires. The larger sample improved statistical precision and analytical power, supporting more stable regression estimates when multiple predictors are analysed simultaneously (Hair et al., 2022).

3.4 Research Instrument

Primary data were gathered using a structured questionnaire developed for this study after reviewing literature on educational quality, student satisfaction, graduate employability, CBET, and TVET quality assurance. The instrument captured multiple dimensions of student experience and programme quality through closed items and open-ended prompts. The questionnaire included eleven sections covering demographic characteristics, admission experiences, teaching quality, curriculum relevance, learning resources and facilities, student support, career guidance, industry exposure, employability preparedness, financial challenges, overall satisfaction, future aspirations, and open-ended items on institutional challenges and suggested improvements. Most attitudinal items used five-point Likert scales tailored to each construct, such as Strongly Disagree to Strongly Agree, Very Poor to Excellent, or Very Dissatisfied to Very Satisfied. Standardised response formats supported consistent measurement and simplified analysis.

3.5 Validity and Reliability of the Research Instrument

Instrument validity and reliability were addressed prior to the main survey. Content validity was supported through literature review and expert review by specialists in educational research, quality assurance, strategic management, and TVET administration. The reviewers assessed clarity, relevance, sequencing, and coverage, and their feedback informed revisions that improved readability and content alignment. Construct validity was tested using Exploratory Factor Analysis (EFA). Internal consistency reliability was assessed with Cronbach's alpha for each construct. Values at or above 0.70 were treated as acceptable, above 0.80 as good, and above 0.90 as excellent. Corrected item-total correlations and the "alpha if item deleted" statistics were reviewed to identify items weakening reliability.

3.6 Data Collection Procedure

Ethical and administrative approval was obtained from the National Commission for Science, Technology and Innovation (NACOSTI), and relevant authorities granted permission to conduct the study. Participation was voluntary; respondents were informed of study purposes, confidentiality protections, and the right to withdraw without consequences. Written informed consent was obtained before questionnaire administration. Data were collected during scheduled classes to maximise participation and reduce disruption. Trained research assistants administered questionnaires after orientation on objectives, ethics, sampling, and standardised procedures. Students completed questionnaires individually without lecturer or administrator involvement, reducing response bias. After collection, questionnaires were checked for completeness and consistency. Where minor omissions existed, respondents were asked to correct them while still present. Each questionnaire was coded with a unique identifier before entry into IBM SPSS Statistics Version 29. Double-entry verification, random spot checks, and daily reconciliation were used to reduce entry errors.

3.7 Data Analysis Techniques

Analysis was conducted in IBM SPSS Statistics Version 29, following a structured process. The dataset was first screened for missing values, outliers, coding issues, and assumption violations to ensure suitability for multivariate analysis (Field, 2024). Descriptive statistics were produced using frequencies, percentages, means, and standard deviations, while skewness and kurtosis offered a first check on normality. Cross-tabulations compared responses across programme areas and levels. Multiple linear regression was used to estimate combined and individual effects of predictors on satisfaction. Statistical significance was evaluated at $\alpha = 0.05$ ($p < 0.05$). Open-ended responses were analysed thematically and integrated with quantitative findings.

3.8 Ordinary Least Squares (OLS) Regression

The model estimated is: $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \epsilon$

Where:

Y = Overall Student Satisfaction

X₁ = Teaching Quality and Curriculum Relevance

X₂ = Learning Resources and Institutional Facilities

X₃ = Student Support Services (including career guidance and industry exposure)

X₄ = Financial Challenges

X_5 = Employability Preparedness

β_0 = Constant (intercept)

β_1 – β_5 = Regression coefficients

ε = Error term

The model estimated how changes in each predictor explained variation in satisfaction while holding other predictors constant. Coefficient significance was assessed using t-tests, and overall model significance was tested through an ANOVA F-test at $\alpha = 0.05$.

Multiple linear regression under OLS estimation is used to test the influence of the five independent variables on satisfaction. Assumptions were checked to support unbiased and efficient estimates (Hair et al., 2022; Wooldridge, 2020).

Normality of residuals was checked through visual inspection rather than a single numerical test. Histograms of standardized residuals were reviewed alongside normal probability (P–P) plots with the aim of judging how closely the residual pattern aligned with a normal distribution.

To identify multicollinearity, the predictor set was examined using the Variance Inflation Factor (VIF). The resulting VIF statistics were considered as indicators of whether correlations among independent variables were large enough to inflate standard errors and bias the stability of the coefficient estimates.

Error independence was evaluated via the Durbin–Watson statistic. This diagnostic was used to flag autocorrelation in the residuals; values falling within the commonly accepted interval were taken as evidence that serial dependence was not a concern.

For homoscedasticity, constant variance of the error term was assessed using both the Breusch–Pagan test and the White test. Each procedure served to check whether residual variability changed systematically across fitted values.

The linearity condition was examined by plotting standardized residuals against standardized predicted values. These scatterplots were inspected for departures from linear structure, with particular attention to whether residuals appeared randomly dispersed around zero across the prediction range. Taken together, the diagnostics were applied to confirm that the core assumptions of Ordinary Least Squares (OLS) multiple regression were met prior to estimating the model and drawing inferences from the reported coefficients.

4. Results

This section presents findings on student experience and programme quality at TUM-TVET. Results follow the study objectives and conceptual framework, beginning with response rate and respondent characteristics, then moving to OLS diagnostics, descriptive findings, and inferential results. Regression results, hypothesis tests, qualitative findings, and an integrated summary conclude the section.

4.1 Response Rate

A total of 248 questionnaires were returned, screened, and retained for analysis. The achieved sample exceeded the planned minimum, strengthening statistical precision and regression stability, especially given multiple predictors.

Table 1 Response Rate

Description	Frequency
Planned minimum sample	160
Reserve sample	16
Total planned sample	176
Valid questionnaires analysed	248
Response rate used for analysis	100% of returned questionnaires

4.2 Respondent Characteristics

Respondents were described by programme area, programme level, age, and gender.

Table 2 Distribution of Respondents by Programme Area

Programme Area	Frequency (n)	Percentage (%)
Engineering and Technology	66	26.6
Business and Management	61	24.6
Information and Communication Technology	43	17.3
Applied Sciences	34	13.7
Maritime and Logistics	28	11.3
Other Programmes	16	6.5
Total	248	100.0

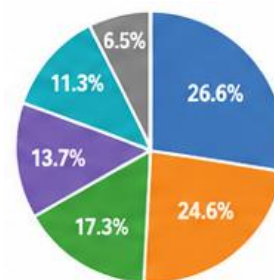


Table 3 Distribution of Respondents by Programme Level

Programme Level	Frequency (n)	Percentage (%)
Diploma	208	83.9
Certificate	32	12.9
Artisan	7	2.8
Other	1	0.4
Total	248	100.0

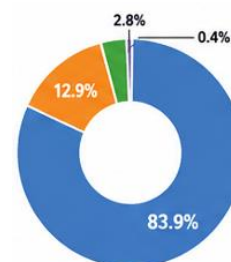


Table 4 Distribution of Respondents by Age Group

Age Group	Frequency (n)	Percentage (%)
18–24 years	206	83.0
25–34 years	39	15.7
35 years and above	3	1.3
Total	248	100.0

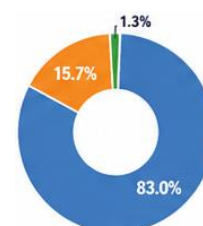
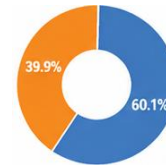


Table 5 Distribution of Respondents by Gender

Gender	Frequency (n)	Percentage (%)
Male	149	60.1
Female	99	39.9
Total	248	100.0



The sample reflects broad representation across programme areas, levels, age groups, and gender. Most respondents were Diploma students aged 18–24, consistent with the institutional profile.

4.3 OLS Assumptions

Before estimating the multiple regression model, several OLS diagnostics were run to check that the model's core assumptions held. The checks focused on whether the residuals were roughly normal, whether predictors showed multicollinearity, whether errors were independent, and whether homoscedasticity and linearity were present. Meeting these conditions supports the reliability, efficiency, and overall validity of the coefficient estimates and the inferences drawn from them (Hair et al., 2022; Field, 2024).

Normality Test

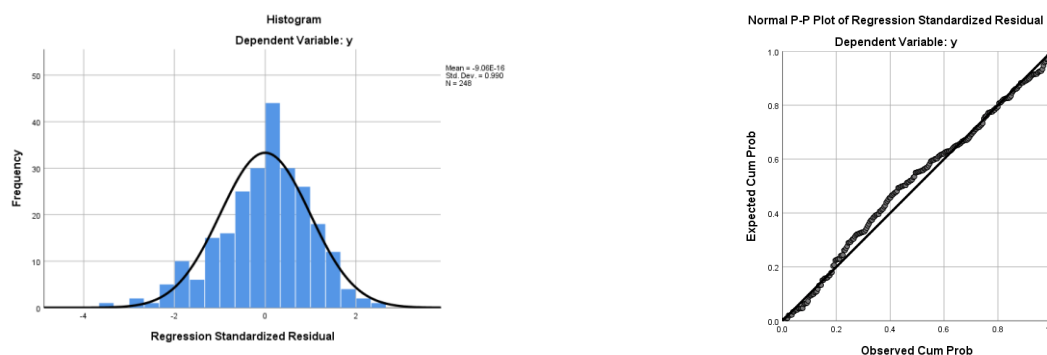


Figure 2: Residual histograms and P–P plots indicated approximate normality.

From the histogram of standardized residuals, the distribution appeared close to bell-shaped. The Normal P–P plot told the same story, with points tracking the diagonal reference line closely. Taken together, these visuals suggest the residuals were approximately normally distributed, so the normality requirement for multiple regression was adequately met.

Multicollinearity Test

Table 6 Multicollinearity Diagnostics

Predictor Variable	Tolerance	VIF	Interpretation
Teaching Quality and Curriculum Relevance (X_1)	0.560	1.786	No multicollinearity
Learning Resources and Institutional Facilities (X_2)	0.540	1.852	No multicollinearity
Student Support Services & Industry Exposure (X_3)	0.747	1.338	No multicollinearity
Financial Challenges (X_4)	0.980	1.020	No multicollinearity
Employability Preparedness (X_5)	0.704	1.421	No multicollinearity

The collinearity statistics showed tolerance values between 0.540 and 0.980, alongside VIF values from 1.020 to 1.852. With tolerances all above 0.10 and VIFs comfortably below 5.0, the results point to no meaningful multicollinearity problems among the predictors. In practical terms, each independent variable appears to contribute its own distinct explanatory signal to the model.

Independence of Errors

Table 7 Durbin-Watson Test for Independence of Errors

Statistic	Value
Sample Size (n)	248
Number of Predictors	5
Durbin-Watson Statistic	1.794
Lower Critical Value (dL)	1.751
Upper Critical Value (dU)	1.833
Decision	No evidence of autocorrelation

A Durbin–Watson value of 1.794 sat within the acceptable band for independent residuals and did not indicate first-order autocorrelation. This supports the independence-of-errors assumption, implying the residuals behaved as if randomly ordered and the coefficient estimates were not distorted by serial dependence.

Homoscedasticity Test

Table 8 Homoscedasticity Tests

Test	Test Statistic	Degrees of Freedom	p-value	Decision
Breusch-Pagan LM Test	5.369	5	0.373	Homoscedasticity satisfied
Breusch-Pagan F Test	1.071	(5, 242)	0.377	Homoscedasticity satisfied
White LM Test	5.472	2	0.065	Homoscedasticity satisfied
White F Test	2.764	(2, 245)	0.065	Homoscedasticity satisfied

Both the Breusch–Pagan and White tests returned non-significant results ($p > 0.05$). This indicates that residual variance stayed stable across the range of fitted values. As a result, there is no sign of heteroscedasticity, and the homoscedasticity assumption can be regarded as satisfied, reinforcing the efficiency of the estimated coefficients.

Linearity Test

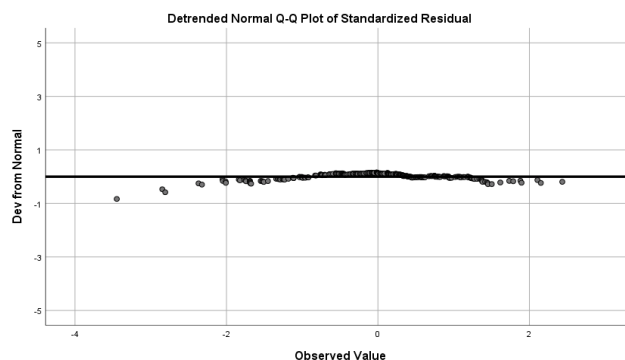


Figure 3: Residual scatterplots showed random dispersion without systematic form.

The standardized residuals scatterplot showed points dispersed in a largely random way around the horizontal axis, without obvious curvature or systematic structure. Such a pattern is consistent with linear relationships between the predictors and the dependent variable, so the linearity assumption underlying the regression is supported.

4.4 Descriptive Analysis of Study Variables

Before moving on to any inferential testing, descriptive statistics were calculated to sketch a clear picture of how respondents viewed the key variables in the study. In practice, the analysis relied on mean values to capture the typical response for each construct, which, in turn, signals how strongly students tended to agree with the items used to gauge teaching quality and curriculum relevance, learning resources and institutional facilities, student support services and industry exposure, employability preparedness, financial challenges, and overall student satisfaction. These means were read against a five-point Likert scale, with larger mean scores taken to represent more positive perceptions. Beyond simply summarising the data, the descriptive results offer useful context, pointing to institutional strengths as well as aspects that appear to need attention, and they also set the stage for the correlation and multiple regression analyses that follow.

Table 9 Study Variables

Construct	Item	Mean	Interpretation
Teaching Quality & Curriculum	Programme prepares students for employment	4.01	High
	Library services adequately support learning	3.77	High
	Programme enhances workplace readiness	3.73	High
	Teaching is engaging	3.69	High
	Curriculum reflects industry needs	3.68	High
Learning Resources & Facilities	Library services	3.77	High
	Classroom facilities	3.61	High
	ICT facilities	3.29	Moderate
	Internet connectivity	3.14	Moderate
	Workshops/Laboratories	3.08	Moderate
	Equipment adequacy	2.98	Moderate
Student Support & Industry Exposure	Academic support services	2.95	Moderate
	Financial support awareness	2.90	Moderate
	Interaction with industry	2.27	Low
Employability Preparedness	Programme prepares students for employment	4.01	High
	Workplace readiness	3.73	High
	Employer reputation	3.95	High
	Skills relevant to employment	3.70	High

Table 9 summarises the descriptive statistics for the study's variables. In general, respondents reported positive views of teaching quality, how well the curriculum matched real-world needs, preparation for employment, and the institution's standing, with most mean scores clustering in the high range. The strongest item was "the programme prepares students for employment" ($M = 4.01$). Close behind were "the institution has a positive reputation among employers" ($M = 3.95$), "library services adequately support learning" ($M = 3.77$), "the programme enhances workplace readiness" ($M = 3.73$), and "the skills acquired are relevant to employment" ($M = 3.70$). Taken together, these

patterns indicate that students largely saw the institution as delivering solid academic programmes and producing graduates with labour-market relevant capabilities.

A different picture emerges for learning resources, facilities, and student support, where ratings were less positive overall. Classroom facilities were viewed favourably ($M = 3.61$), and library services again performed well ($M = 3.77$). Still, several areas settled only in the moderate band: ICT facilities ($M = 3.29$), internet connectivity ($M = 3.14$), workshop and laboratory facilities ($M = 3.08$), equipment adequacy ($M = 2.98$), academic support services ($M = 2.95$), and awareness of financial support opportunities ($M = 2.90$). The lowest mean was recorded for interaction with industry professionals ($M = 2.27$), pointing to limited exposure to industry contacts and fewer chances for career networking. This set of results places infrastructure and student support among the most pressing areas for institutional attention.

Overall, the descriptive results show a clear split: respondents were broadly satisfied with teaching, curriculum relevance, employability preparation, and institutional reputation, yet they also reported shortcomings in learning resources, ICT provision, industry engagement, and financial support arrangements. These descriptive patterns frame the later inferential analyses by clarifying where students perceive strengths and where they see gaps, and by offering an initial view of what might be driving overall student satisfaction and graduate employability.

Financial Challenges

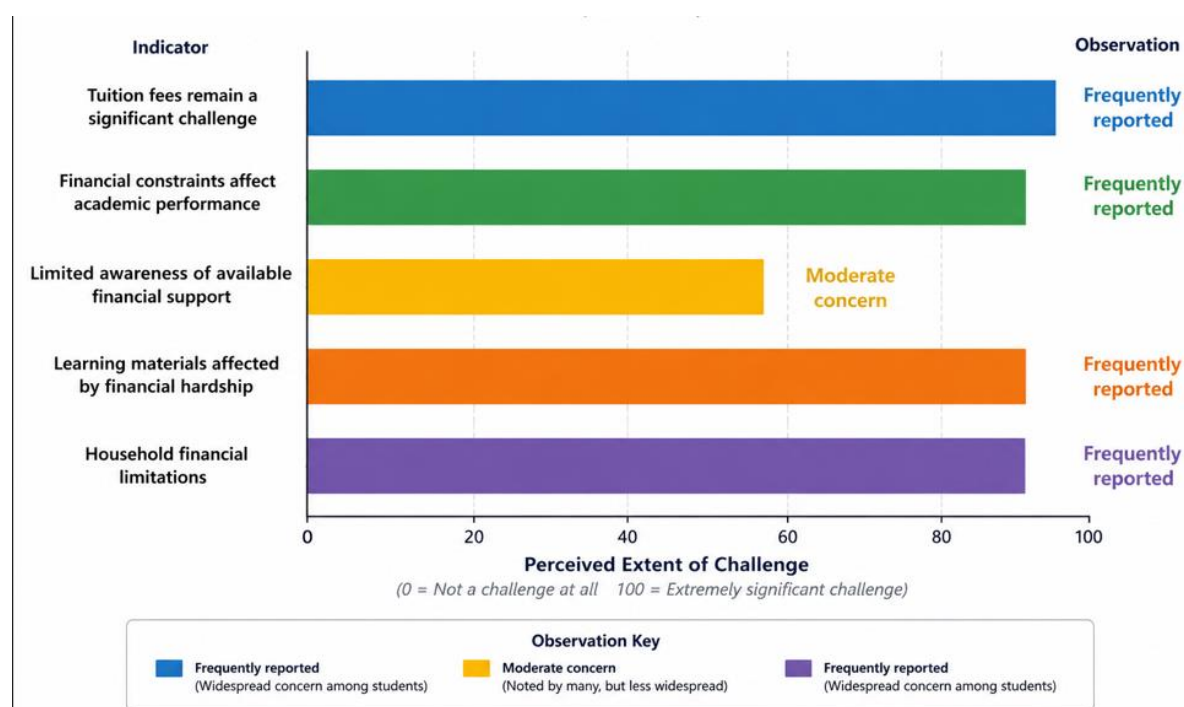


Figure 4: Student perception on financial challenges

Figure 4 presents how students view the financial difficulties that shape their academic experience. Across the responses, financial strain emerges as a dominant issue for most participants. Commonly cited problems include tuition costs and restricted household finances, alongside the way financial hardship limits the purchase of learning materials and influences academic performance.

Taken together, the pattern points to ongoing economic pressure that can reduce students' access to key resources and weaken their capacity to engage fully in academic work. In practice, these pressures can translate into lower participation, poorer academic outcomes, and slower movement through their programmes.

By comparison, inadequate awareness of existing financial support options appears as a mid-level concern. This suggests that some students can find information about assistance, yet communication and visibility of available mechanisms still need strengthening. Overall, the results point to a clear case for institutional action focused on lowering financial obstacles, including clearer promotion of financial aid, broader student support provision, and specific measures that improve access to lower-cost learning resources. Responding to these issues is likely to support student well-being, strengthen academic performance, and raise satisfaction with the institution.

Overall Student Satisfaction

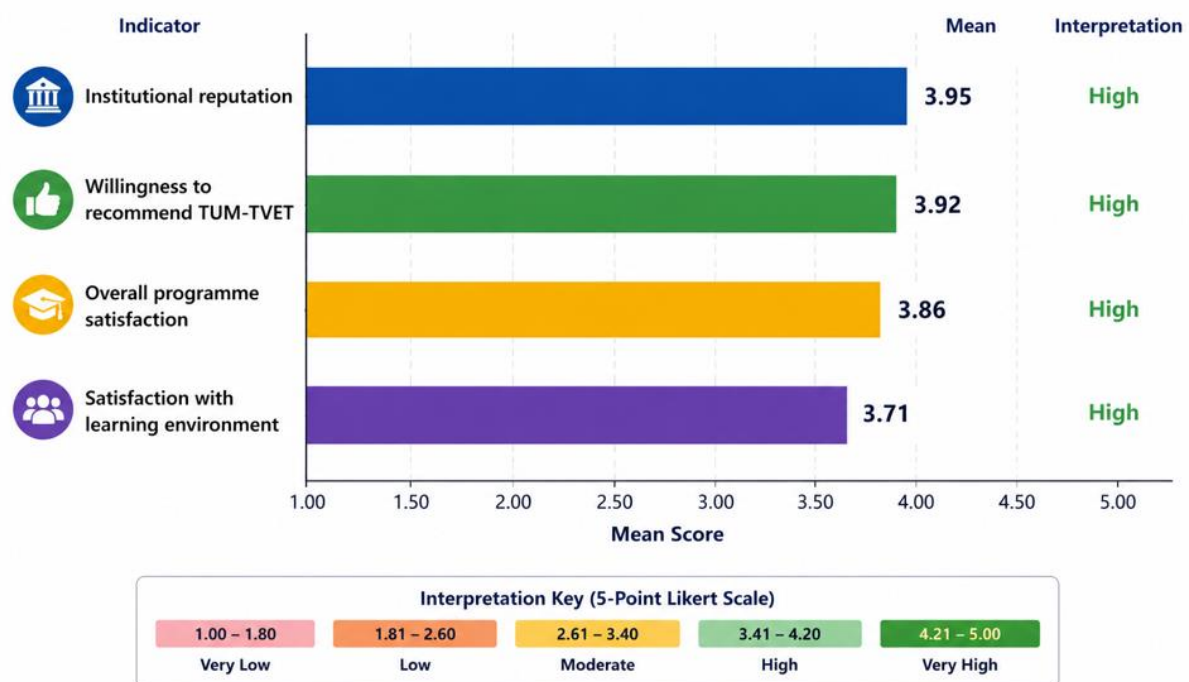


Figure 5: Overall student satisfaction

Figure 5 summarises respondents' overall satisfaction with their learning experience at TUM-TVET. Across the set of satisfaction indicators, the evaluation is uniformly positive, with mean values spanning 3.71 to 3.95, and each score located in the high category. The institution's reputation obtained the strongest rating ($M = 3.95$), which points to a general view of TUM-TVET as credible and well regarded. Closely behind, respondents reported a strong willingness to recommend TUM-TVET to prospective learners ($M = 3.92$), and they also expressed high overall satisfaction with their programmes ($M = 3.86$), indicating confidence in the perceived quality and value of what is offered.

While the learning environment produced the lowest mean score ($M = 3.71$), it still remained within the high range. This pattern implies that, despite being comparatively less strongly rated than the other indicators, respondents were broadly satisfied with both the physical and academic

conditions under which learning occurs. Taken together, the results show favourable perceptions of the TUM-TVET educational experience, especially in relation to institutional standing and programme quality. Consistently high satisfaction levels also suggest that the institution has created a positive learning experience that is likely to support student engagement, strengthen institutional loyalty, and encourage positive word-of-mouth. In descriptive terms, these outcomes also offer initial support for the inferential analyses that follow, which examine factors associated with overall student satisfaction and graduate employability.

Table 10 Students' Willingness to Recommend TUM-TVET

Response	Frequency	Percentage (%)
Yes	92	37.1
Probably Yes	90	36.3
Not Sure	38	15.3
Probably Not	9	3.6
No	19	7.7
Total	248	100.0

Table 10 summarises respondents' readiness to recommend TUM-TVET to future students, a measure used here to reflect general satisfaction with the institution and the strength of student loyalty. The results indicate that positive referral intentions dominated the sample. A total of 92 respondents (37.1%) reported that they would definitely recommend TUM-TVET, and 90 respondents (36.3%) stated that they would probably recommend the institution. Taken together, these two categories account for 73.4% of all responses, which indicates that close to three-quarters of the students viewed the institution favourably and were prepared to support it through recommendation.

Less affirmative positions were reported by a smaller segment. Uncertainty was evident among 38 respondents (15.3%) who were not sure whether they would recommend TUM-TVET, a pattern consistent with ambivalence that can arise from uneven experiences or expectations that were not fully met. Negative referral intentions were limited in scale, with 9 respondents (3.6%) indicating they would probably not recommend the institution, and 19 respondents (7.7%) reporting that they would not recommend it.

Overall, the distribution points to generally strong student satisfaction, confidence in the institution, and a willingness to act as advocates. At the same time, the presence of uncertainty and a small but meaningful share of negative responses signals the value of sustained attention to improvement, particularly in learning resources, student support provision, industry linkages, and financial aid, so that the student experience is strengthened and institutional reputation further reinforced.

4.5 Multiple Regression Analysis

To determine how far teaching quality and curriculum relevance, learning resources and institutional facilities, student support services and industry exposure, financial challenges, and employability preparedness shape overall student satisfaction among TUM-TVET students, a multiple regression model was estimated. This approach was selected because it allows several predictors to be tested at once against a single outcome, while the effect of each variable is evaluated with the remaining predictors held constant. Before estimating the model, key Ordinary Least Squares (OLS) assumptions, namely normality, multicollinearity, independence of errors, homoscedasticity,

and linearity, were examined. The diagnostics indicated that these conditions were adequately satisfied, supporting the use of regression for the present dataset. Results are reported in two steps: first, the overall statistical significance of the model is evaluated, then the unique contribution of each predictor to overall student satisfaction is examined.

Overall Model Significance

Table 11 ANOVA

Source of Variation	Sum of Squares	df	Mean Square	F	p-value
Regression	26.397	5	5.279	30.408	<0.001
Residual	42.015	242	0.174		
Total	68.412	247			

As reported in Table 11, the ANOVA output shows that the multiple regression equation reached statistical significance, $F(5, 242) = 30.408$, $p < 0.001$. Taken together, the five predictors account for a statistically meaningful share of the variance in overall student satisfaction, indicating that the combined set of variables contributes to explaining differences in the outcome. On this basis, the null hypothesis asserting that the model lacks explanatory capacity is rejected, and the results support the conclusion that the specified regression model fits the observed data adequately and can be used to assess the separate effects of each predictor.

7.6.2 Regression Coefficients

After the multiple regression model was shown to meet the core OLS assumptions, attention shifted to the estimated coefficients, with the aim of identifying what each predictor contributed to students' employability preparedness once the remaining independent variables were held constant. For this purpose, the unstandardized coefficients (β) were reviewed alongside their standard errors, t-statistics, p-values, and Variance Inflation Factor (VIF) values, allowing the direction and size of each association, as well as its statistical reliability, to be assessed. Predictors with p-values below 0.05 were treated as statistically significant and, on that basis, were kept in the final specification of the regression model. By contrast, variables failing to reach this threshold were removed when deriving the most suitable predictive equation. Coefficient estimates are reported in Table 12.

Table 12 Multiple Regression Coefficients

Variable	B	Standard Error	t-value	p-value	VIF	Decision
Constant	1.755	0.151	11.595	<0.001	—	Significant
Teaching Quality & Curriculum Relevance (X_1)	0.059	0.039	1.490	0.138	1.786	Not Significant
Learning Resources & Institutional Facilities (X_2)	0.102	0.040	2.562	0.011	1.852	Significant
Student Support Services & Industry Exposure (X_3)	0.066	0.031	2.166	0.031	1.338	Significant
Financial Challenges (X_4)	-0.029	0.021	-1.370	0.172	1.020	Not Significant
Employability Preparedness (X_5)	0.218	0.034	6.342	<0.001	1.421	Significant

Optimal Regression Model: $Y = 1.755 + 0.102X_2 + 0.066X_3 + 0.218X_5$

4.6 Hypothesis Testing

Table 13 Summary of Hypothesis Testing

Hypothesis	p-value	Decision	Conclusion
H ₀₁ : Teaching quality and curriculum relevance do not significantly influence overall student satisfaction.	0.138	Do not reject H ₀	Not supported
H ₀₂ : Learning resources and institutional facilities do not significantly influence overall student satisfaction.	0.011	Reject H ₀	Supported
H ₀₃ : Student support services, career guidance and industry exposure do not significantly influence overall student satisfaction.	0.031	Reject H ₀	Supported
H ₀₄ : Financial challenges do not significantly influence overall student satisfaction.	0.172	Do not reject H ₀	Not supported
H ₀₅ : Employability preparedness does not significantly influence overall student satisfaction.	<0.001	Reject H ₀	Supported

Table 13 presents the results of hypothesis tests derived from the multiple regression model. Evidence of statistical significance emerged for three out of the five proposed relationships, and these were therefore supported. A positive association with overall student satisfaction was observed for learning resources and institutional facilities (H₀₂; $p = 0.011$), student support services, career guidance and industry exposure (H₀₃; $p = 0.031$), and employability preparedness (H₀₅; $p < 0.001$), which led to rejection of the relevant null hypotheses. By contrast, the coefficients for teaching quality and curriculum relevance (H₀₁; $p = 0.138$) and for financial challenges (H₀₄; $p = 0.172$) were not statistically significant, so the corresponding null hypotheses were not rejected. Taken together, these results indicate that overall satisfaction is driven mainly by students' views of employability preparedness, the availability of institutional resources, and the adequacy of support services, while teaching quality and curriculum relevance, alongside financial challenges, show no independent effect once the other predictors are controlled for.

4.7 Qualitative Findings

Qualitative evidence drawn from the open-ended questionnaire items aligned with the quantitative results while adding texture to how students described their day-to-day study conditions and the learning setting. Through thematic analysis, a set of recurrent concerns became visible, and students repeatedly framed these issues as central to both educational experience and satisfaction. Financial strain was raised most often. Students pointed to tuition fees, the cost of accommodation, transport outlays, and the price of learning materials, and they linked these pressures to reduced participation in academic activities and uneven access to essential resources.

Alongside cost-related difficulties, respondents drew attention to the narrow scope of practical training. Inadequate workshop provision, limited hands-on learning, and constrained access to up-to-date laboratory equipment were described as weakening the applied component of their programmes. Many students also referred to the scarcity of industrial attachment opportunities, internships, employer engagement, and organised educational visits. With fewer openings to enter work settings, students reported less contact with real working environments and fewer chances to build applied competences associated with employability. Other themes appeared repeatedly as well, including insufficient ICT infrastructure, unstable internet services, and gaps in academic guidance and mentoring, which participants associated with obstacles to effective teaching, learning, and academic progress.

In response to these concerns, students outlined a series of institutional actions they believed would raise the quality of the learning experience. The recommendations most often proposed centred on expanding opportunities for practical training, for example by extending laboratory and workshop sessions, updating learning spaces with contemporary equipment, and stabilising and strengthening internet connectivity to better support digital learning. Respondents also argued for wider industrial attachment provision, more internship placements, and closer cooperation with industry so that workplace exposure and graduate employability are strengthened. Calls were also made to reinforce academic support through mentoring, academic advising, and counselling services. At the same time, students asked for broader financial support initiatives, particularly scholarships and bursaries, to reduce monetary barriers and improve access to higher education.

When considered together, the two strands of evidence yield a consistent account of what shapes overall student satisfaction at TUM-TVET. Although students generally reported positive views on teaching quality, curriculum relevance, institutional reputation, employability preparedness, and the overall educational experience, both quantitative and qualitative results converged on the same improvement priorities: practical training, learning infrastructure, ICT provision, industry engagement, and student support. Results from the multiple regression analysis reinforced this pattern, identifying employability preparedness, learning resources and institutional facilities, and student support services combined with industry exposure as the strongest predictors of overall satisfaction. By contrast, teaching quality and curriculum relevance, as well as financial challenges, did not show statistically significant independent effects once other predictors were held constant. This convergence indicates that gains in satisfaction and educational outcomes are most likely to follow from strengthening experiential learning, upgrading institutional infrastructure, expanding industry partnerships, and improving student support systems.

4.8 Discussion

This study assessed how five dimensions of student experience and programme quality relate to overall student satisfaction at TUM-TVET. Students rated teaching, curriculum relevance, employability preparedness, institutional standing, and satisfaction positively. Still, gaps were identified in practical facilities, industry engagement, academic support, digital infrastructure, and financial support. The discussion links findings to relevant literature rather than repeating results. It also considers implications for TVET in Kenya and comparable contexts. The broader implication is that students increasingly evaluate education as a combined experience, where learning resources, institutional support, workplace learning opportunities, and employability expectations weigh heavily alongside teaching.

Teaching Quality and Curriculum Relevance

Students reported strong perceptions of teaching quality and curriculum relevance. They described lecturers as knowledgeable and teaching as reasonably engaging, and they viewed the curriculum as aligned with labour market requirements. These patterns align with Ramsden (2003) and with Biggs and Tang (2011) on the importance of alignment and active learning. Even so, regression results indicate that teaching quality and curriculum relevance did not significantly predict overall satisfaction once other factors were included. This pattern suggests that acceptable teaching may function as a baseline expectation rather than a differentiating factor. In such circumstances, institutional resources, industry exposure, and employability opportunities become more prominent in shaping satisfaction, consistent with the multidimensional view of satisfaction discussed by Harvey

(2011). The findings also suggest that perceived curriculum relevance does not automatically translate into sufficient practical competence, especially where practical sessions and workplace exposure are limited. Strengthening experiential components would therefore reinforce perceptions of quality teaching and relevant curriculum.

Learning Resources and Institutional Facilities

Learning resources and facilities significantly predicted satisfaction. While classrooms and library services were rated positively, weaknesses were noted in workshops, laboratories, equipment, ICT access, and internet reliability. These findings match UNESCO (2021) and the World Bank (2022), both of which emphasise that TVET effectiveness depends on adequate infrastructure, especially for practical competence. Moderate ratings for ICT and internet are especially important given the growing digitalisation of industries such as logistics, manufacturing, maritime operations, and business. Digital capacity is no longer optional; it shapes both learning and future work readiness. As argued by the African Development Bank (2020), investing in TVET infrastructure is an investment in national competitiveness.

Student Support Services, Career Guidance and Industry Exposure

Support services and industry exposure also significantly predicted satisfaction. Students reported only moderate satisfaction with academic support and financial support awareness, while industry interaction was rated low. The findings correspond with Tinto (1993) on the value of integration and Astin (1993) on the role of involvement in strengthening outcomes. Limited exposure to industry suggests missed chances for work-integrated learning, which Jackson (2015) identifies as essential for bridging classroom learning and workplace expectations. The independent contribution of support services in the regression model indicates that strengthening mentoring, career guidance, and employer engagement is likely to improve satisfaction and assist employment transitions.

Employability Preparedness

Employability preparedness emerged as the strongest predictor of satisfaction. Students tended to judge their educational experience in terms of the career value it provides, aligning with Yorke's (2006) view of employability as a combination of competence, skills, attributes, and confidence. A tension remains: students reported high employability confidence but limited industry interaction. That gap indicates that employability perceptions might be shaped mainly by classroom learning rather than workplace exposure. As the ILO (2022) notes, employer evaluations often depend heavily on practical experience and work behaviours developed through workplace settings. Strengthening attachments, apprenticeship arrangements, mentorship, and industry-linked projects would better connect perceived readiness with demonstrated competence.

Financial Challenges

Financial constraints did not show independent statistical significance in the regression model, yet descriptive and qualitative evidence suggests that they remain a major part of student experience. Students identified fees, accommodation, transport, and learning materials as recurring burdens. This reflects Johnstone (2018) and UNESCO (2021), which emphasise financial barriers as constraints on participation and completion. The lack of independent significance may indicate that students separate institutional quality from household economic realities, or that positive experiences in teaching and employability preparation partly offset financial pressures when forming overall satisfaction

judgments. Still, the consistent appearance of finance-related concerns suggests a strong case for improving communication and access to bursaries, scholarships, HELB, and emergency support.

Overall Student Satisfaction

Overall satisfaction levels were high, with institutional reputation and recommendation willingness rated favourably. This aligns with Elliott and Shin (2002), who conceptualise satisfaction as a cumulative evaluation shaped by varied institutional interactions. As Harvey (2011) notes, satisfaction is a strategic indicator linked to engagement, persistence, and institutional reputation. High satisfaction does not mean all dimensions are equally strong. Students remained satisfied while identifying significant gaps, indicating that satisfaction is flexible and can improve through targeted changes, particularly where resources, support systems, and industry connections are strengthened.

Comparison with Previous Studies

The study aligns with UNESCO (2021) and OECD (2023) in recognising teaching and curriculum relevance as essential foundations. It also supports World Bank (2022) and African Development Bank (2020) findings that infrastructure deficits constrain TVET effectiveness. The role of support services and workplace learning mirrors Jackson (2015), while theoretical patterns echo Tinto (1993) and Astin (1993). The study extends prior work by showing that employability preparedness can outweigh teaching quality as a predictor of satisfaction in a contemporary TVET context, implying that students increasingly view educational quality through the lens of career readiness.

Policy and Practice Implications

First, curriculum reforms should be paired with stronger workplace learning through expanded attachments, apprenticeships, employer partnerships, and collaboration on curriculum review. Second, continued investment in laboratories, workshops, ICT, and internet access should be treated as a priority, given its strong link to satisfaction. Third, institutions should strengthen advising, counselling, mentoring, career services, and placement support. Finally, student experience surveys should be embedded within quality assurance systems to track changes and guide evidence-based decisions.

Concluding Discussion

Student satisfaction in TVET reflects a combination of teaching quality, resources, support, and employability confidence. While TUM-TVET shows strengths in teaching, curriculum relevance, employability preparation, and reputation, improvements are needed in practical training, employer engagement, ICT infrastructure, and support services. Employability preparedness emerged as the dominant predictor of satisfaction, indicating that career readiness is central to how students judge programme quality.

5. Conclusions and Recommendations

5.1 Conclusion

This research investigated how student experience and programme quality relate to satisfaction and perceived employability at TUM-TVET, focusing on teaching and curriculum, resources and facilities, support and industry exposure, financial constraints, and employability preparedness. Using

quantitative and qualitative evidence, the study offers a broad account of factors shaping programme quality within a TVET institution and contributes to discussions on TVET quality assurance in Kenya. Students rated teaching, curriculum relevance, reputation, employability preparedness, and programme satisfaction positively, pointing to a credible academic environment. Yet, they also raised concerns about limited practical learning, inadequate workshop and laboratory capacity, uneven internet access, restricted employer engagement, and weak support services. Financial hardship remained a widely reported barrier, especially regarding fees, transport, accommodation, and learning materials. Regression results show that employability preparedness most strongly predicts satisfaction, followed by learning resources and facilities, then student support and industry exposure. Teaching quality and curriculum relevance, though rated highly, did not show an independent effect once other institutional dimensions were considered. The evidence implies that students treat effective teaching as a baseline expectation, while satisfaction increasingly depends on practical learning conditions, institutional support, modern learning resources, and confidence in employment prospects. The study therefore treats TVET quality as inherently multidimensional. Teaching quality alone does not guarantee positive experience; institutions must also provide infrastructure, strong industry ties, student support, and experiential learning. By contributing evidence from coastal Kenya and by analysing multiple dimensions together, the study adds a more integrated understanding of satisfaction and employability perceptions in TVET.

5.2 Recommendations

Findings suggest that improving satisfaction and employability requires institutional strategies beyond classroom delivery.

Recommendations for TUM-TVET Institute

Strengthen Practical and Experiential Learning

Greater emphasis should be placed on practical training through upgrades to workshops, laboratories, simulation spaces, and equipment. Increasing the share of practical sessions and embedding project-based learning and problem-solving tasks would improve competence acquisition.

Expand Industry Partnerships and Workplace Learning

Structured partnerships with employers, professional bodies, county governments, and industry organisations should be strengthened to increase internships, attachments, mentorship, guest lectures, field visits, curriculum review input, and joint innovation projects. Department-level employer advisory committees can support continuous relevance.

Modernize Learning Resources and Digital Infrastructure

Upgrading laboratories, workshops, ICT facilities, and internet access should remain a strategic priority. Wireless coverage and bandwidth should be improved to support blended learning, research, and digital collaboration.

Strengthen Student Support and Career Development Services

Support should extend beyond advising to include mentoring, counselling, career coaching, entrepreneurship training, employability workshops, and placement services. Regular career fairs and employer networking events should be formalised.

Improve Access to Student Financial Support

Awareness efforts on HELB, scholarships, bursaries, and work-study opportunities should be improved. Partnerships with private organisations and development actors could support scholarship schemes and emergency support funds.

Institutionalize Continuous Quality Improvement

Annual student experience surveys, graduate tracer studies, employer satisfaction surveys, and regular curriculum reviews should be embedded in quality assurance processes, with performance indicators tied to satisfaction, employability, and industry engagement. 10.2 Recommendations for Government, TVET Regulators, and Policy Makers National agencies should continue coordinated reforms supporting CBET, infrastructure upgrades, curriculum modernisation, and closer institution–industry collaboration. Funding models should prioritise modernisation of workshops, laboratories, and digital infrastructure. Employer incentives for attachments and apprenticeship participation should also be strengthened.

Recommendations for Industry and Development Partners

Industry involvement in curriculum design, attachments, guest teaching, equipment support, innovation hubs, and applied research should be expanded. Development partners and professional associations can support capacity building, digital transformation, and infrastructure upgrades.

Recommendations for Future Research

Comparative studies across institutions and regions in Kenya are needed to test whether similar patterns hold nationally. Longitudinal designs would allow assessment of changes over time and connections to actual employment outcomes. Future studies should incorporate employer perspectives and broaden stakeholder participation beyond students. Deeper qualitative methods, including interviews and focus groups, could provide richer insight. More advanced modelling approaches, including SEM and mediation or moderation analysis, may also clarify pathways linking programme quality to satisfaction and employability. Limitations Several limitations should be considered. The study focused on one institution, so findings should be read primarily within the TUM-TVET context. The cross-sectional design provides a snapshot rather than capturing change over time. Self-reported data can be influenced by expectations and response bias, even though anonymity was stressed. Employability was measured as perceived employability rather than actual labour market outcomes. Also, stakeholders such as employers, alumni, and staff were not included, and qualitative evidence was limited to open-ended survey responses. The regression model also did not include all possible influences on satisfaction, such as leadership, mental health, motivation, family support, or labour market conditions. Despite these constraints, the study used a large sample, validated measures, appropriate statistical procedures, OLS diagnostics, and triangulation through qualitative responses, supporting the credibility of the conclusions.

5.3 Suggestions for Future Research

Future research should extend this work across multiple TVET institutions and regions to support benchmarking and sector-wide quality strategies. Longitudinal tracking from entry through employment would provide stronger evidence on the relationship between experience and labour market outcomes. Employer assessments should be incorporated to compare student self-ratings with workplace expectations. Studies should also include lecturers, alumni, attachment supervisors,

administrators, and policymakers. Given rapid technological change, research should examine how digital learning, artificial intelligence, virtual laboratories, simulations, and learning analytics affect teaching, engagement, and employability. Attention should also broaden to competencies such as entrepreneurship, leadership, sustainability, communication, and emotional intelligence. Finally, cross-country comparisons could identify effective practices for policy and institutional learning.

References

- African Development Bank. (2020). African economic outlook 2020: Developing Africa's workforce for the future. African Development Bank.
- Astin, A. W. (1993). What matters in college? Four critical years revisited. Jossey-Bass.
- Biggs, J., & Tang, C. (2011). Teaching for quality learning at university (4th ed.). Open University Press.
- Creswell, J. W., & Creswell, J. D. (2023). Research design: Qualitative, quantitative, and mixed methods approaches (6th ed.). Sage.
- Elliott, K. M., & Shin, D. (2002). Student satisfaction: An alternative approach to assessing this important concept. *Journal of Higher Education Policy and Management*, 24(2), 197–209.
- Field, A. (2024). Discovering statistics using IBM SPSS Statistics (6th ed.). Sage.
- Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2022). Multivariate Data Analysis (8th ed.). Cengage Learning.
- Harvey, L. (2011). The nexus of feedback and improvement. In *Student Feedback*. Centre for Research into Quality.
- ILO. (2022). Global employment trends for youth 2022. International Labour Organization.
- International Centre for Technical and Vocational Education and Training (UNEVOC). (2022). Transforming TVET for successful and just transitions. UNESCO-UNEVOC International Centre.
- Jackson, D. (2015). Employability skill development in work-integrated learning. *Studies in Higher Education*, 40(2), 350–367.
- Johnstone, D. B. (2018). Financing higher education: Worldwide perspectives and policy options. Sense Publishers.
- Kahu, E. R., & Nelson, K. (2018). Student engagement in the educational interface: Understanding the mechanisms of student success. *Higher Education Research & Development*, 37(1), 58–71. <https://doi.org/10.1080/07294360.2017.1344197>
- Organisation for Economic Co-operation and Development. (2023). Education at a glance 2023: OECD indicators. OECD Publishing.
- Quality Assurance Agency for Higher Education. (2023). Student engagement toolkit: Improving the student learning experience. QAA.

- Ramsden, P. (2003). Learning to teach in higher education (2nd ed.). RoutledgeFalmer. Republic of Kenya. (2023). Sessional Paper No. 1 of 2023 on education reforms. Ministry of Education.
- Saunders, M., Lewis, P., & Thornhill, A. (2023). Research methods for business students (9th ed.). Pearson.
- Tinto, V. (1993). Leaving college: Rethinking the causes and cures of student attrition (2nd ed.). University of Chicago Press.
- UNESCO. (2021). Reimagining our futures together: A new social contract for education. UNESCO.
- Wooldridge, J. M. (2020). Introductory econometrics: A modern approach (7th ed.). Cengage Learning.
- World Bank. (2022). Skills development in Sub-Saharan Africa: Preparing youth for the future of work. World Bank.
- Yorke, M. (2006). Employability in higher education: What it is – What it is not. Higher Education Academy