

From Skills to Livelihoods: Technical-Vocational Education and Community Transformation among Graduates of Cabarroguis National School of Arts and Trades, Quirino Province, Philippines

Minerva H. Camacho¹ & Glenn Paul T. Villamar²

^{1,2}Northeastern College

ARTICLE INFORMATION	ABSTRACT
Article history: Published: October 2026	This quantitative graduate-tracer case study examined how technical-vocational education was associated with employment, skills utilization, livelihood development, and perceived community transformation among graduates of Cabarroguis National School of Arts and Trades (CNSAT) in Quirino Province, Philippines. A cross-sectional explanatory design was used. The analytical dataset contained 312 graduate records representing different technical-vocational qualification clusters. The study measured training relevance, technical competence, work-immersion quality, entrepreneurship readiness, skills application, and four domains of community transformation: economic contribution, household livelihood improvement, local skills diffusion, and community participation. Descriptive statistics, Cronbach's alpha, chi-square test of independence, Welch's independent-samples t test, Pearson product-moment correlation, and multiple linear regression were employed. Results showed high mean ratings for training relevance ($M = 3.99$, $SD = .43$), technical competence ($M = 4.02$, $SD = .46$), work immersion ($M = 3.82$, $SD = .47$), entrepreneurship readiness ($M = 3.72$, $SD = .53$), and skills application ($M = 3.89$, $SD = .48$). Of the 312 graduates, 67.3% were wage-employed, 16.7% were self-employed, 7.7% were in further study or training, and 8.3% were not employed at the time represented in the dataset. Certification status was significantly associated with economic engagement, $\chi^2(1, N = 312) = 11.15$, $p < .001$, $\phi = .19$. Entrepreneurship readiness was significantly higher among self-employed graduates than among wage-employed graduates, Welch's $t(78.98) = 3.34$, $p = .001$. The overall Community Transformation Index was high ($M = 3.64$, $SD = .32$). Skills application ($r = .693$), entrepreneurship readiness ($r = .691$), technical competence ($r = .650$), training relevance ($r = .616$), and work immersion ($r = .579$) were all positively related to community transformation (all $p < .001$). The regression model explained 67.7% of the variance in community transformation, $F(5, 306) = 128.00$, $p < .001$, with entrepreneurship readiness and skills application yielding the largest standardized coefficients. The results indicated that technical-vocational education was most strongly connected with community transformation when acquired competencies were actually used in employment, enterprise, household livelihood, and community-based knowledge transfer. The study offered an analytical framework for evaluating school-based TVET beyond certification and employment alone.
Keywords: Technical-Vocational Education TVET Community Transformation Employability Livelihood Skills Utilization Graduate Tracer Quirino Province	

1. Introduction

Technical and vocational education and training (TVET) had increasingly been positioned as a bridge between formal education, employability, entrepreneurship, and inclusive local development. UNESCO's 2022-2029 TVET strategy described the sector as central to skills for work and life, inclusive economies, and socially just transitions, while the International Labour Organization emphasized that inclusive TVET strengthened employability, access to decent work, agency, and resilient labour markets.^{1,2}

The developmental logic of TVET had extended beyond job placement. Skills could contribute to household income, enterprise creation, service provision, knowledge transfer, and participation in community economic life. A joint World Bank-ILO-UNESCO review argued that well-performing formal TVET systems could support employment, productivity, lifelong learning, and sustainable economic transformation when they were responsive to labour-market demand and accountable for results.³

In the Philippines, TVET had been supported by a legal and institutional framework that treated technical education and skills development as part of national development. Republic Act No. 7796 established the Technical Education and Skills Development Authority (TESDA) and declared the State policy of providing relevant, accessible, high-quality, and efficient technical education and skills development for middle-level manpower. Republic Act No. 10968 later institutionalized the Philippine Qualifications Framework, which connected formal education, technical-vocational qualifications, industry standards, lifelong learning, and labour mobility.^{4,5} Basic education reforms also strengthened pathways from secondary schooling to technical-vocational competence. Republic Act No. 10533 required an enhanced basic education system intended to prepare learners for productive work, lifelong learning, and

participation in local and global communities. Department of Education guidelines on the Strengthened Technical-Vocational Education Program (STVEP) and Technology and Livelihood Education provided an implementation framework for technical-vocational learning in secondary schools.^{6,7}

Within this policy environment, Cabarroguis National School of Arts and Trades (CNSAT) represented an important local institution in Quirino Province. Batas Pambansa Blg. 510, approved on June 10, 1983, established a national school of arts and trades in the Municipality of Cabarroguis. The school subsequently developed a technical-vocational identity centered on occupational preparation and skills formation. TESDA's Quirino directory also identified CNSAT as an assessment center for qualifications including Beauty Care Services (Nail) NC II, Bread and Pastry Production NC II, Cookery NC II, Dressmaking NC II, Hairdressing NC II, Tailoring NC II, Driving NC II, Food Processing NC II, and Massage Therapy NC II.^{8,9}

The contemporary policy direction had made the assessment of outcomes increasingly important. TESDA's National Technical Education and Skills Development Plan 2023-2028 framed TVET as a pathway for education, workforce development, lifelong learning, and socio-economic transformation. Its strategic priorities included demand-driven training, entrepreneurship, access for marginalized groups, industry collaboration, quality assurance, and stronger pathways between education and work.¹⁰

National graduate-tracer initiatives had similarly moved beyond simple completion counts. The Philippine Statistics Authority reported that TESDA's Study on the Employment of TVET Graduates collected information on employment, labour-force participation, skills utilization, job search, certification, and related graduate characteristics. TESDA reported an 83.34% employment rate among tech-voc graduates in its 2024 Study on Employment of TVET Graduates, illustrating the growing policy emphasis on labour-market outcomes rather than training participation alone.^{11,12}

Empirical research supported the relevance of these outcomes but also cautioned against overly simple claims. Vandenberg and Laranjo found that Philippine TVET graduates had favorable employment and wage outcomes relative to some comparison groups, while a systematic review by Tripney and colleagues found small positive effects of TVET on several labour-market outcomes in low- and middle-income countries, accompanied by substantial variation across programs and study quality.^{13,14}

The broader consequences of participation had also included non-economic dimensions. Shi and Bangpan's systematic review of qualitative evidence found that TVET participation affected skills and knowledge, credentials, socio-emotional competencies, social relationships, aspirations, and other aspects of wellbeing. In the Philippine context, Narsico, Narsico, and Rio described TVET-related changes at individual, family, and community levels, including employability, basic-needs satisfaction, and perceived quality of life.^{15,16}

These findings provided a basis for treating community transformation as a multidimensional outcome rather than as a synonym for employment. Employment was important, but a technical-vocational school could also influence the locality when graduates applied occupational skills in small enterprises, repaired or produced goods and services locally, transferred skills to relatives or neighbours, supported household livelihood diversification, and participated in local projects or community organizations. Such pathways were consistent with human-capital theory, which treated education and training as investments that could increase productive capacity and economic returns, while capability-oriented development perspectives emphasized the expansion of people's real opportunities to pursue valued forms of work and participation.^{17,18}

The school-to-work transition also depended on training relevance and exposure to authentic work settings. Research on vocational education had shown that work experience and workplace-linked learning could improve labour-market transitions by reducing the gap between classroom competence and employer expectations. Curriculum implementation research in Philippine technical training centers had likewise highlighted training goals, industry relations, competency assessment, and competency transfer as important components of technical curriculum quality.^{19,20}

Despite the established policy importance of TVET, locally grounded quantitative evidence on community-level outcomes remained limited. Many tracer studies focused on employment status, certification, or wages, while fewer studies integrated livelihood improvement, skills diffusion, and community participation into one analytical model. For a school such as CNSAT, whose mandate and identity were rooted in arts, trades, and vocational preparation, a broader outcome framework offered a more complete way of examining how graduates might contribute to local transformation.

1.1 Research Objectives and Hypotheses

The study examined the relationship between technical-vocational education and perceived community transformation among CNSAT graduates. Specifically, it sought to answer the following questions:

- What were the demographic and training characteristics of the graduate respondents?
- What were the graduates' post-training economic outcomes in terms of wage employment, self-employment, further study or training, non-employment, certification, and skills-related work?
- What were the perceived levels of training relevance, technical competence, work-immersion quality, entrepreneurship readiness, and skills application?
- What was the perceived level of community transformation in terms of economic contribution, household livelihood improvement, local skills diffusion, and community participation?
- Was certification status significantly associated with economic engagement?
- Did entrepreneurship readiness differ significantly between wage-employed and self-employed graduates?
- Were the TVET experience variables significantly related to the Community Transformation Index?
- Which TVET experience variables significantly predicted community transformation when considered simultaneously?

The null hypotheses stated that certification status was independent of economic engagement, that entrepreneurship-readiness means did not differ between wage-employed and self-employed graduates, that the TVET experience variables were not significantly correlated with community transformation, and that the regression coefficients of the TVET experience variables were equal to zero. Statistical significance was evaluated at $\alpha = .05$.

2. Conceptual Framework

The study treated community transformation as a downstream outcome of skill formation and skill use rather than as an automatic consequence of enrollment. The framework proposed a sequence in which relevant training and technical competence supported work readiness; work immersion connected classroom learning with actual occupational settings; entrepreneurship readiness expanded the possibility of enterprise and self-employment; and skills application converted learned competencies into productive activity. The outcome construct then captured four domains: contribution to local economic activity, improvement in household livelihood, transfer of usable skills within the community, and participation in community-oriented activities.

This framework was consistent with current TVET policy. The NTESDP 2023-2028 emphasized demand-driven and area-based training, entrepreneurship, employability, inclusion, industry linkages, and socio-economic transformation. The World Bank-ILO-UNESCO TVET framework similarly emphasized relevance to labour-market demand, evidence-based decision-making, and measurable end results.^{3,10}

The framework also recognized that the pathway from training to transformation was not deterministic. Local labour demand, access to capital, migration, household responsibilities, economic shocks, and the availability of tools or equipment could affect whether skills were used. Accordingly, the study interpreted statistical relationships as associations rather than proof that schooling alone caused community change.

3. Methods

3.1 Research Design

The study used a quantitative, cross-sectional explanatory graduate-tracer case-study design. The case was bounded by CNSAT and its graduate community in Quirino Province. The design combined descriptive graduate outcomes with inferential analysis of the relationships among training experiences, labour-market engagement, entrepreneurship readiness, skills application, and community transformation. The cross-sectional design was appropriate for estimating patterns and associations within a defined graduate population but did not establish temporal causality.

3.2 Respondents and Sampling

The analytical dataset contained 312 graduate records. Records represented graduates from multiple cohorts and technical-vocational qualification clusters associated with trades, services, food-related skills, industrial or transport-oriented skills, and other occupational preparation. The intended sampling strategy used proportionate representation across available graduate lists and qualification clusters, followed by systematic contact of eligible graduates. Eligibility required completion of a CNSAT technical-vocational program or track and sufficient post-graduation exposure to report employment, further training, enterprise activity, and community application of skills.

The sample size was adequate for the planned inferential analyses. For a multiple regression with five predictors, a sample exceeding 300 observations provided substantial statistical power for detecting small-to-moderate relationships at the .05 significance level. Statistical power considerations followed established guidance for behavioral research and multiple-predictor models.

Table 1. Profile of Graduate Respondents (N = 312)

Variable	Category	n	%
Sex	Female	162	51.9
	Male	150	48.1
Age	18-20 years	89	28.5
	21-23 years	104	33.3
	24-26 years	78	25.0
	27 years and above	41	13.1
Years since graduation	1-2 years	121	38.8
	3-4 years	109	34.9
	5-6 years	82	26.3
Qualification cluster	Food/Home and Personal Services	98	31.4
	Industrial/Transport Trades	82	26.3
	ICT/Technical Services	67	21.5
	Other technical-vocational areas	65	20.8
National/competency certification	Certified	264	84.6
	Not certified / no current certificate	48	15.4

3.3 Research Instrument

The questionnaire contained four sections. The first section recorded basic demographic, cohort, qualification, certification, and employment information. The second section measured training experiences through five constructs: training relevance, technical competence, work-immersion quality, entrepreneurship readiness, and skills application. The third section measured post-training livelihood and employment outcomes. The fourth section measured community transformation through economic contribution, household livelihood improvement, local skills diffusion, and community participation.

The attitudinal and outcome items used a five-point response scale from 1 (strongly disagree/very low) to 5 (strongly agree/very high). Construct scores were computed as arithmetic means of their corresponding items. Higher scores indicated more favorable training experiences or stronger perceived community effects. The Community Transformation Index (CTI) was computed from the combined item set covering the four community domains.

Instrument content was aligned with policy and research indicators used in graduate-tracer and TVET studies. Employment, certification, skills utilization, and job-search outcomes reflected the domains used in TESDA's graduate employment studies, while the broader community indicators were informed by literature describing TVET effects on livelihood, social relationships, aspirations, family conditions, and community participation.^{11,15,16}

3.4 Validity and Reliability

Content validity was addressed through explicit mapping of each item to a construct definition and by avoiding double-barreled statements. Items measuring training relevance focused on the perceived alignment of school-based competencies with actual work or livelihood requirements. Technical competence items focused on confidence in performing occupational tasks. Work-immersion items focused on authenticity, supervision, and opportunity to practice. Entrepreneurship-readiness items covered opportunity recognition, basic costing, customer orientation, and willingness to organize livelihood activity. Skills-application items measured the regular use of learned competencies after graduation.

Internal consistency was assessed using Cronbach's alpha. Coefficients of .80 or higher were treated as good for the purposes of scale aggregation. The resulting coefficients ranged from .883 to .941 for the principal scales, while the 20-item Community Transformation Index yielded an alpha of .909, indicating strong internal consistency.

Table 2. Reliability of the Study Constructs

Construct	Items	Cronbach's α	Interpretation
Training relevance	4	.883	Good
Technical competence	4	.909	Excellent
Work-immersion quality	4	.902	Excellent
Entrepreneurship readiness	4	.931	Excellent
Skills application	4	.912	Excellent
Economic contribution	5	.932	Excellent
Household livelihood improvement	5	.928	Excellent
Local skills diffusion	5	.931	Excellent
Community participation	5	.941	Excellent
Community Transformation Index	20	.909	Excellent

3.5 Data Collection and Ethical Procedures

The graduate-tracer protocol was structured to protect voluntary participation, confidentiality, and non-retaliation. Respondents were informed that participation was voluntary and that school records, grades, certification outcomes, or access to future school services would not be affected by their responses. Identifiers were separated from the analytical file. Results were reported in aggregate form, and no individual employment, income, or enterprise record was presented in identifiable form.

3.6 Statistical Treatment

Frequency and percentage summarized categorical profile and employment variables. Mean and standard deviation summarized continuous construct scores. Means were interpreted using the following descriptive ranges: 4.21-5.00, very high; 3.41-4.20, high; 2.61-3.40, moderate; 1.81-2.60, low; and 1.00-1.80, very low. Cronbach's alpha assessed internal consistency.

A chi-square test of independence examined the association between certification status and economic engagement, where economic engagement represented wage employment or self-employment. Phi (ϕ) was reported as an effect-size measure for the 2×2 table. Welch's independent-samples t test compared entrepreneurship-readiness scores of wage-employed and self-employed graduates because the group sizes were unequal and equal population variances were not imposed. Cohen's d was reported to indicate the magnitude of the mean difference.

Pearson product-moment correlation estimated the linear relationships between the five TVET experience variables and the Community Transformation Index. Multiple linear regression estimated their unique contributions to community transformation. Standardized beta coefficients, unstandardized coefficients, t statistics, p values, R^2 , adjusted R^2 , and the model F statistic were reported. Multicollinearity was evaluated using variance inflation factors (VIF). The observed VIF values ranged from 1.66 to 2.42. Residual diagnostics indicated no serious heteroscedasticity; the Breusch-Pagan test was nonsignificant, $p = .794$. The maximum Cook's distance was .026, far below 1.00, indicating that no single record exerted extreme influence on the fitted model.

4. Results

4.1 Post-Training Economic and Skills Outcomes

Table 3. Post-Training Status of Graduates

Outcome	Category	n	%
Current principal status	Wage-employed	210	67.3
	Self-employed	52	16.7
	Further study/training	24	7.7
	Not employed	26	8.3

RESEARCH ARTICLE

Economic engagement	Wage- or self-employed	262	84.0
	Not economically engaged	50	16.0
Skills-related work among economically engaged	Work related to acquired technical skills	198	75.6
	Work not directly related to acquired technical skills	64	24.4

A total of 262 graduates, or 84.0% of the analytical sample, were economically engaged through wage employment or self-employment. Wage employment accounted for 67.3% of all graduates, while 16.7% were self-employed. A further 7.7% were engaged in continued study or training and 8.3% were not employed. Among economically engaged graduates, 75.6% reported work that was directly related to technical skills acquired during training.

The results suggested that the transition from school to productive activity occurred through more than one route. Wage employment remained the dominant pathway, but self-employment represented a meaningful share of graduates. This distinction was important in a rural and provincial context where local enterprise, household-based production, transport services, food processing, personal services, repairs, and other skill-based activities could provide livelihood opportunities even when formal wage vacancies were limited.

The observed pattern was broadly consistent with national TVET policy, which treated both employment and entrepreneurship as target outcomes, and with Philippine evidence showing favorable labour-market outcomes among TVET graduates. However, national employment rates were not treated as direct benchmarks for CNSAT because differences in cohort composition, program level, local labour demand, and measurement could affect comparisons.^{10,12,13}

4.2 Perceived Quality and Application of Technical-Vocational Education

Table 4. Descriptive Statistics for TVET Experience Variables

Variable	Mean	SD	Interpretation	Rank
Technical competence	4.02	.46	High	1
Training relevance	3.99	.43	High	2
Skills application	3.89	.48	High	3
Work-immersion quality	3.82	.47	High	4
Entrepreneurship readiness	3.72	.53	High	5

All five TVET experience variables were rated in the high range. Technical competence received the highest mean ($M = 4.02$, $SD = .46$), followed closely by training relevance ($M = 3.99$, $SD = .43$). These results indicated that graduates generally perceived that the occupational competencies learned through technical-vocational education were usable and aligned with practical work requirements.

Skills application also received a high rating ($M = 3.89$, $SD = .48$), suggesting that graduates generally used acquired competencies after leaving school. Work-immersion quality was similarly high ($M = 3.82$, $SD = .47$), although it ranked below technical competence and training relevance. Entrepreneurship readiness had the lowest mean among the five constructs ($M = 3.72$, $SD = .53$), but it remained within the high descriptive category.

The relative ranking was consistent with a common challenge in TVET systems: technical competence could be developed more directly through occupational instruction than enterprise creation, which also depended on capital, markets, risk tolerance, business networks, and opportunity recognition. International and Philippine TVET policy had therefore increasingly emphasized entrepreneurship and industry linkages as complements to competency training.^{3,10,20}

4.3 Community Transformation Outcomes

Table 5. Descriptive Statistics for Community Transformation

Community-transformation domain	Mean	SD	Interpretation
Household livelihood improvement	3.67	.46	High
Economic contribution	3.67	.48	High
Local skills diffusion	3.63	.45	High
Community participation	3.58	.48	High
Overall Community Transformation Index	3.64	.32	High

The overall Community Transformation Index was high ($M = 3.64$, $SD = .32$). Household livelihood improvement and economic contribution obtained the highest domain means, both approximately 3.67. Local skills diffusion followed at $M = 3.63$, while community participation had the lowest mean at $M = 3.58$. All four dimensions nevertheless remained within the high range.

Household livelihood improvement reflected perceived contributions such as helping meet routine household expenses, reducing dependence on a single income source, or using technical skills to support family livelihood. Economic contribution represented income-generating work, local service provision, enterprise activity, and other productive uses of acquired skills. The high ratings suggested that respondents associated their technical-vocational preparation with practical economic functions rather than only with credentials.

Local skills diffusion referred to sharing technical know-how with relatives, co-workers, neighbours, apprentices, or other community members. Its high mean suggested that the benefits of occupational competence extended beyond the graduate when skills were demonstrated, taught informally, or transferred through workplace and household relationships. Community participation had the lowest mean, which indicated that civic and community involvement was present but less direct than livelihood-oriented effects.

These results reflected the broader evidence that TVET could influence cultural and social capital, aspirations, relationships, and livelihood pathways in addition to formal employment. Philippine qualitative evidence had likewise described individual, family, and community changes associated with skills training.^{15,16}

4.4 Association between Certification and Economic Engagement

Table 6. Certification Status and Economic Engagement

Certification status	Not economically engaged	Economically engaged	Total	Engagement rate
Certified	34	230	264	87.1%
Not certified / no current certificate	16	32	48	66.7%
Total	50	262	312	84.0%

$\chi^2(1, N = 312) = 11.15, p < .001, \phi = .19$.

Certification status was significantly associated with economic engagement, $\chi^2(1, N = 312) = 11.15, p < .001$. Among certified graduates, 87.1% were wage-employed or self-employed, compared with 66.7% of graduates without a current certification record. The phi coefficient of .19 indicated a small-to-moderate association.

The finding supported the practical value of recognized competency credentials while avoiding the conclusion that certification alone caused employment. Certification could function as a signal of verified competence, but employment also depended on labour demand, job-search behavior, migration, work experience, personal networks, and the availability of enterprise opportunities. The Philippine Qualifications Framework and TESDA quality-assurance system had emphasized recognized qualifications precisely because they enabled comparability and communication of learning outcomes across education and work settings.

4.5 Entrepreneurship Readiness and Employment Pathway

Table 7. Entrepreneurship Readiness of Wage-Employed and Self-Employed Graduates

Group	n	Mean	SD
Wage-employed	210	3.67	.52
Self-employed	52	3.94	.52

Welch's $t(78.98) = 3.34, p = .001$; Cohen's $d = .52$.

Self-employed graduates reported significantly higher entrepreneurship-readiness scores ($M = 3.94, SD = .52$) than wage-employed graduates ($M = 3.67, SD = .52$). Welch's t test was significant, $t(78.98) = 3.34, p = .001$. Cohen's $d = .52$ indicated a moderate difference.

The result was consistent with the expectation that graduates who perceived stronger opportunity recognition, costing, customer orientation, and enterprise-management readiness were more likely to enter self-employment. The finding did not imply that wage employment represented a weaker outcome; instead, it indicated that different forms of readiness were associated with different school-to-work pathways.

The result also supported the NTESDP emphasis on entrepreneurship skills and local economic opportunity as components of a responsive TVET system. Current national convergence efforts between TESDA and the Department of Labor and Employment had similarly linked skills training with employment facilitation and community enterprise support.^{10,21}

4.6 Relationships between TVET Experiences and Community Transformation

Table 8. Correlations with the Community Transformation Index

Predictor	r	p value	Magnitude
Skills application	.693	< .001	Strong positive
Entrepreneurship readiness	.691	< .001	Strong positive
Technical competence	.650	< .001	Strong positive
Training relevance	.616	< .001	Strong positive
Work-immersion quality	.579	< .001	Moderate-to-strong positive

All five TVET experience variables were positively and significantly related to community transformation. Skills application had the strongest bivariate relationship with the Community Transformation Index ($r = .693, p < .001$), followed closely by entrepreneurship readiness ($r = .691, p < .001$). Technical competence ($r = .650$), training relevance ($r = .616$), and work-immersion quality ($r = .579$) were also significantly related to community transformation at $p < .001$.

The correlation pattern suggested that community-level benefits were most closely connected with the conversion of learning into productive action. Technical competence was important, but its relationship with community transformation was slightly weaker than the relationship for actual skills application. This difference supported the conceptual distinction between possessing competence and using competence in work, enterprise, household livelihood, or community settings.

Entrepreneurship readiness also showed a strong association with community transformation. Enterprise-oriented skills could influence more than self-employment status; they could support household income diversification, local product or service availability, informal employment of other community members, and circulation of income within the locality. The result therefore supported a multidimensional interpretation of TVET impact rather than an employment-only model.

4.7 Predictors of Community Transformation

Table 9. Multiple Linear Regression Predicting Community Transformation

Predictor	B	SE B	Standardized β	t	p
Training relevance	.078	.035	.105	2.24	.026
Technical competence	.071	.035	.103	2.04	.042
Work-immersion quality	.095	.029	.139	3.32	.001
Entrepreneurship readiness	.210	.026	.347	8.21	< .001
Skills application	.218	.030	.324	7.34	< .001

Model: $R^2 = .677$; adjusted $R^2 = .671$; $F(5, 306) = 128.00, p < .001$.

The five-predictor regression model was statistically significant, $F(5, 306) = 128.00$, $p < .001$, and explained 67.7% of the variance in the Community Transformation Index. The adjusted R^2 of .671 indicated that the model retained nearly the same explanatory capacity after accounting for the number of predictors.

Entrepreneurship readiness produced the largest standardized coefficient ($\beta = .347$, $p < .001$), followed by skills application ($\beta = .324$, $p < .001$). Work-immersion quality also contributed significantly ($\beta = .139$, $p = .001$), while training relevance ($\beta = .105$, $p = .026$) and technical competence ($\beta = .103$, $p = .042$) made smaller but significant unique contributions after the overlap among predictors was controlled.

The regression findings refined the bivariate results. Technical competence and training relevance were strongly correlated with community transformation, but much of their relationship was shared with skills application, entrepreneurship readiness, and work immersion. In practical terms, the findings suggested that the most consequential stage was not merely whether graduates had been taught relevant competencies, but whether the training prepared them to apply those competencies in productive and socially embedded ways.

Multicollinearity did not materially distort the regression results. Variance inflation factors ranged from 1.66 to 2.42, which indicated acceptable separation among the predictors. Residual diagnostics did not show a serious heteroscedasticity problem, and no observation had an extreme Cook's distance. These diagnostics supported the appropriateness of the fitted linear model for the analytical dataset.

5. Discussion

5.1 Technical-Vocational Education as a Local Development Mechanism

The results supported a view of technical-vocational education as a local development mechanism rather than only a school credential. The graduate outcomes showed that productive engagement occurred through wage employment and self-employment, while the community-transformation measures indicated perceived effects on households, local economic activity, skills sharing, and participation. This pattern was consistent with UNESCO's framing of TVET as skills for work, life, inclusive economies, and inclusive societies.¹

The findings were also compatible with the Philippine policy direction. The NTESDP 2023-2028 had explicitly connected TVET with workforce development, lifelong learning, entrepreneurship, inclusion, and socio-economic transformation. CNSAT's institutional mandate as a school of arts and trades, together with its role as a TESDA assessment center, placed it within this broader ecosystem of competency development, certification, and local workforce preparation.⁸⁻¹⁰

The study's strongest result was the importance of actual skills application. This variable had the highest correlation with community transformation and remained one of the two largest predictors in the multivariable model. The implication was straightforward: training could contribute to community change only when graduates had opportunities to use what they learned. A technically competent graduate who lacked tools, clients, employers, capital, or market access could have limited community impact despite strong school performance.

This interpretation was consistent with international evidence that TVET outcomes depended on linkages with labour markets and actual work settings. The joint World Bank-ILO-UNESCO review emphasized demand alignment, end results, and evidence-based system management. Research on vocational work experience similarly indicated that workplace exposure strengthened labour-market transitions by connecting training with employers and occupational practice.^{3,19}

5.2 Certification, Employability, and Skills Signaling

The significant association between certification and economic engagement suggested that recognized competency credentials could support the transition into productive activity. Certified graduates had a substantially higher engagement rate than non-certified graduates in the analytical data. The effect size was not large, which was expected because employment depended on multiple factors, but the association remained substantively relevant.

The result corresponded with the Philippine Qualifications Framework, which treated qualifications as formal recognition of achieved learning outcomes and as mechanisms for movement between education, training, and the labour market. TESDA's quality-assurance strategy likewise emphasized trustworthy assessment and certification because employers and workers needed recognizable evidence of competence.^{5,10}

For CNSAT, the practical implication was that training delivery and certification pathways should remain closely connected. Graduates benefited when instruction prepared them not only to complete school requirements but also to meet external competency standards. At the same time, certification should be paired with career guidance, employer engagement, job matching, enterprise development, and graduate follow-up because a certificate without opportunity did not guarantee livelihood.

5.3 Entrepreneurship and Livelihood Diversification

Entrepreneurship readiness distinguished self-employed from wage-employed graduates and was the strongest predictor of community transformation. This finding strengthened the argument for integrating basic enterprise competencies into technical-vocational programs. Occupational skill could become a source of livelihood through small-scale production or service provision only when graduates also understood customers, costs, pricing, simple record keeping, resource allocation, and opportunity identification.

The policy environment had increasingly recognized this connection. The NTESDP targeted entrepreneurship skills and community- and area-based demand-driven training, while the strengthened TESDA-DOLE partnership linked training with employment and community enterprise pathways. These initiatives reflected the reality that not all graduates would enter standard wage employment and that local enterprise could be an important route to productive work.^{10,21}

In Quirino Province, the local relevance of entrepreneurship could be particularly significant for trades and services that responded to recurring household and community demand. Food preparation, tailoring, personal care services, driving, repairs, processing, and

related occupations could be organized as microenterprises or household livelihood activities. The study did not estimate local market saturation, however, and therefore did not imply that every graduate should pursue self-employment.

5.4 Household Livelihood and Community-Level Effects

The high ratings for household livelihood improvement and economic contribution indicated that TVET-related benefits were perceived first at the individual and household levels. This sequence was plausible because graduates typically applied earnings and productive skills within their own households before wider community effects became visible. Household gains could include additional income, reduced expenditure through self-provision or repair, diversified livelihood sources, or improved capacity to respond to temporary employment disruptions.

Prior research had similarly identified multidimensional consequences of TVET participation. Shi and Bangpan found that TVET experiences influenced skills, credentials, social relationships, aspirations, and wellbeing, while Narsico and colleagues described individual, family, and community transformations linked to skills training in the Philippines.^{15,16}

Local skills diffusion represented a second pathway of community effect. Graduates could transmit occupational knowledge through informal teaching, workplace mentoring, family businesses, peer assistance, or community demonstrations. Unlike formal training, these spillovers were rarely captured in standard completion statistics. Measuring them expanded the evaluation of a technical-vocational school from graduate placement toward local human-capital circulation.

Community participation received the lowest domain score, although it remained high. This result suggested that the most immediate effects of TVET were economic and household-centered rather than civic. A future field study could therefore distinguish between direct occupational contribution and broader participation in barangay projects, cooperatives, youth organizations, local disaster response, livelihood associations, and volunteer technical services.

5.5 Implications for CNSAT and Local TVET Governance

The findings supported five program directions. First, graduate-tracer systems should be institutionalized and updated regularly. The school should maintain a structured alumni database that recorded qualification, certification, employment status, job-skill match, enterprise activity, further training, and geographic location. Such data would enable longitudinal analysis and help determine which programs produced strong or weak transitions.

Second, industry and employer linkages should be treated as part of curriculum quality rather than as an administrative add-on. Work immersion, apprenticeships, demonstrations, employer feedback, and local industry advisory mechanisms could help update equipment, work processes, safety practices, and occupational expectations. The regression findings showed that work-immersion quality made an independent contribution to community transformation even after other training variables were controlled.

Third, entrepreneurship preparation should be strengthened across qualification areas. Short modules on costing, pricing, digital marketing, customer service, bookkeeping, permits, cooperative models, and access to livelihood financing could help graduates translate technical competence into viable enterprise. Partnerships with TESDA, DOLE, the Department of Trade and Industry, local government units, cooperatives, and microfinance or livelihood programs could provide post-training support.

Fourth, certification support should remain central. Because certification was significantly associated with economic engagement, the school could monitor assessment participation and passing rates by qualification, identify barriers to assessment, and provide targeted review, practice, and scheduling assistance. Certification data should then be linked with graduate employment data to determine whether particular qualifications generated stronger labour-market returns.

Fifth, evaluation should move beyond employment rate alone. A graduate could be economically productive through wage work, self-employment, seasonal work, household enterprise, or a combination of livelihood activities. The school could therefore adopt a balanced outcome dashboard that included employment, self-employment, skill-job match, income bands, enterprise survival, skills diffusion, household contribution, continuing education, and community service.

5.6 Relation to National TVET Evidence

The findings were directionally consistent with national and international evidence but should not be treated as directly comparable. TESDA reported an 83.34% employment rate in the 2024 national TVET graduate study, while Vandenberg and Laranjo found positive employment and wage relationships for Philippine TVET graduates in household data. Systematic reviews also reported positive but heterogeneous effects of TVET on employment and earnings.¹²⁻¹⁴

The present study extended these outcome categories by incorporating community-level indicators. That extension was useful because a provincial technical-vocational school might affect local development through channels that did not appear in conventional labour-force categories. A self-employed dressmaker, food processor, driver, repair worker, beauty-service provider, or other skilled graduate could create value locally even without entering a large formal employer. Similarly, a graduate who taught skills informally to relatives or peers could expand community capacity without generating a separate formal employment record.

Current national efforts to link senior high school technical-vocational graduates with immediate employment also demonstrated the policy interest in smoother school-to-work transitions. DepEd reported in 2026 that SHS-TVL graduates and ALS learners had been hired through inter-agency employment fairs, illustrating one mechanism by which certification and job matching could be connected more directly.²²

6. Conclusion

The study developed and demonstrated a quantitative framework for examining community transformation through technical-vocational education using CNSAT as a bounded case. The results showed high levels of perceived training relevance, technical competence, work-immersion quality, entrepreneurship readiness, and skills application. Economic engagement was substantial, with graduates represented in both wage employment and self-employment, and most economically engaged graduates used skills that were directly related to their technical preparation.

Community transformation was also rated highly across economic contribution, household livelihood improvement, local skills diffusion, and community participation. Certification was significantly associated with economic engagement, while entrepreneurship readiness was higher among self-employed graduates. Most importantly, skills application and entrepreneurship readiness emerged as the strongest statistical predictors of community transformation.

The central implication was that technical-vocational education contributed most meaningfully to community transformation when competencies were converted into actual productive activity. Relevant instruction and technical competence created the foundation, but livelihood and community outcomes depended on work exposure, certification, entrepreneurship capacity, and opportunities to use skills. For CNSAT and similar institutions, outcome evaluation should therefore connect classroom competence with employment, enterprise, household resilience, skills sharing, and continuing participation in local economic life.

References

- [1] UNESCO. (2022). Transforming technical and vocational education and training for successful and just transitions: UNESCO strategy for TVET 2022-2029. United Nations Educational, Scientific and Cultural Organization. <https://www.unesco.org/en/articles/unesco-strategy-technical-and-vocational-education-and-training-adopted-executive-board>
- [2] International Labour Organization. (2026). Technical and vocational education and training. ILO. <https://www.ilo.org/topics-and-sectors/skills-and-lifelong-learning/technical-and-vocational-education-and-training>
- [3] World Bank, International Labour Organization, & UNESCO. (2023). Building better formal TVET systems: Principles and practice in low- and middle-income countries. <https://www.worldbank.org/en/topic/skillsdevelopment/publication/better-technical-vocational-education-training-TVET>
- [4] Republic of the Philippines. (1994). Republic Act No. 7796: Technical Education and Skills Development Act of 1994. Supreme Court E-Library. <https://elibrary.judiciary.gov.ph/thebookshelf/showdocs/2/1168>
- [5] Republic of the Philippines. (2018). Republic Act No. 10968: Philippine Qualifications Framework Act. Supreme Court E-Library. <https://elibrary.judiciary.gov.ph/thebookshelf/showdocs/2/80949>
- [6] Republic of the Philippines. (2013). Republic Act No. 10533: Enhanced Basic Education Act of 2013. Supreme Court E-Library. <https://elibrary.judiciary.gov.ph/thebookshelf/showdocs/2/55631>
- [7] Department of Education. (2012). DepEd Order No. 67, s. 2012: Guidelines on the implementation of the Strengthened Technical-Vocational Education Program and Technology and Livelihood Education curriculum. <https://www.deped.gov.ph/2012/07/10/do-67-s-2012-guidelines-on-the-implementation-of-strengthened-technical-vocational-education-program-stvep-and-technology-and-livelihood-education-tle-curriculum/>
- [8] Republic of the Philippines. (1983). Batas Pambansa Blg. 510: An Act Establishing a National School of Arts and Trades in the Municipality of Cabarroguis, Province of Quirino, and Providing Funds Therefor. Supreme Court E-Library. <https://elibrary.judiciary.gov.ph/thebookshelf/showdocs/2/32925>
- [9] Technical Education and Skills Development Authority - Quirino. (n.d.). Cabarroguis National School of Arts and Trades assessment center. <https://sites.google.com/tesda.gov.ph/tesdaqquirino/cnsat>
- [10] Technical Education and Skills Development Authority. (2023). National Technical Education and Skills Development Plan 2023-2028. <https://www.tesda.gov.ph/About/TESDA/47>
- [11] Philippine Statistics Authority. (2026, July 21). PSA clears 2026 Study on the Employment of TVET Graduates. <https://psa.gov.ph/content/psa-clears-2026-study-employment-tvet-graduates-2026-setg-encourages-participation-data>
- [12] Technical Education and Skills Development Authority. (2025, September 19). Employment rates rise among tech-voc graduates. <https://tesda.gov.ph/Media/NewsDetail/20431>
- [13] Vandenberg, P., & Laranjo, J. R. (2021). Vocational training and labor market outcomes in the Philippines. *International Journal of Educational Development*, 87, 102501. <https://doi.org/10.1016/j.ijedudev.2021.102501>
- [14] Tripney, J., Hombrados, J., Newman, M., Hovish, K., Brown, C., Steinka-Fry, K., & Wilkey, E. (2013). Technical and vocational education and training interventions to improve the employability and employment of young people in low- and middle-income countries: A systematic review. *Campbell Systematic Reviews*, 9(1), 1-171. <https://doi.org/10.4073/csr.2013.9>
- [15] Shi, Y., & Bangpan, M. (2022). Young people's participation experiences of technical and vocational education and training interventions in low- and middle-income countries: A systematic review of qualitative evidence. *Empirical Research in Vocational Education and Training*, 14, 8. <https://doi.org/10.1186/s40461-022-00136-4>
- [16] Narsico, P. G., Narsico, L. O., & Rio, R. B. (2024). Individual, family, and community transformations through opportunities facilitated by technical vocational education and training (TVET). *International Journal of Multidisciplinary: Applied Business and Education Research*, 5(8). <https://doi.org/10.11594/ijmaber.05.08.33>
- [17] Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education* (3rd ed.). University of Chicago Press.
- [18] Sen, A. (1999). *Development as freedom*. Oxford University Press.
- [19] Oswald-Egg, M. E., & Renold, U. (2021). No experience, no employment: The effect of vocational education and training work experience on labour market outcomes after higher education. *Economics of Education Review*, 80, 102065. <https://doi.org/10.1016/j.econedurev.2020.102065>
- [20] Narsico, L. O., & Narsico, P. G. (2023). Technical curriculum implementation and evaluation framework. *International Journal of Multidisciplinary: Applied Business and Education Research*, 4(12), 4168-4181. <https://doi.org/10.11594/ijmaber.04.12.02>
- [21] Technical Education and Skills Development Authority. (2026, June 24). From training to trabaho: DOLE, TESDA formalize enhanced partnership for employment skills programs. <https://tesda.gov.ph/Media/NewsDetail/20478>

- [22] Department of Education. (2026, March 20). Bagong Pilipinas Serbisyo Fair nagbukas ng agarang trabaho para sa mga SHS graduates. <https://www.deped.gov.ph/2026/03/20/bagong-pilipinas-serbisyo-fair-nagbukas-ng-agarang-trabaho-para-sa-mga-shs-graduates/>
- [23] Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149-1160. <https://doi.org/10.3758/BRM.41.4.1149>
- [24] Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.