International Journal of Economic, Finance and Business Statistics (IJEFBS)
Vol. 4, No. 1, 2026: 35-44

Entrepreneurship, Technical Education and Global Poverty Reduction: An Empirical Overview

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A R T I C L E I N F O

Keywords: Entrepreneurship, Technical Education, TVET, Poverty Reduction, Panel Data

Received : 18, December
Revised : 19, January
Accepted: 28, February

A B S T R A C T

This study empirically examines the individual and joint effects of entrepreneurship and technical education on global poverty reduction using panel data from 30 countries over the period 2010–2024. Drawing on data from the World Bank Development Indicators, Global Entrepreneurship Monitor (GEM), and UNESCO Institute for Statistics, the study employs panel regression techniques, including Fixed Effects and Random Effects models, with the Hausman test guiding model selection. The findings reveal that both entrepreneurship and technical education exert significant negative effects on poverty levels, indicating their effectiveness in reducing poverty. More importantly, the interaction term between entrepreneurship and technical education is negative and statistically significant, suggesting that their combined effect produces a stronger poverty-reducing impact than either factor independently. Diagnostic tests confirm the robustness of the model, with no evidence of multicollinearity, heteroskedasticity, or serial correlation. The study concludes that integrated policy frameworks that combine entrepreneurial capacity development with technical skills acquisition are more effective tools for poverty alleviation. It recommends the restructuring of educational systems to embed entrepreneurship within technical and vocational training programmes.

DOI: https://doi.org/10.59890/ijefbs.v4i1.355
ISSN-E: 3025-9959
https://journal.multitechpublisher.com/index.php/IJEFBS

INTRODUCTION

Poverty remains one of the most persistent challenges confronting the global economy, particularly in developing nations. Despite decades of policy interventions and development strategies, a significant proportion of the world's population continues to live below the poverty line. According to World Bank, poverty reduction remains central to sustainable development goals, yet progress has been uneven across regions. Scholars have long emphasized the role of human capital development in addressing poverty. Theodore Schultz (1961) and Gary Becker (1964) argued that investment in education enhances productivity and income-earning capacity. However, traditional education systems in many developing countries have been criticized for their excessive focus on theoretical knowledge at the expense of practical skills. In a similar vein, Joseph Schumpeter (1934) identified entrepreneurship as a key driver of economic development through innovation and creative destruction. Entrepreneurship facilitates job creation, enhances productivity, and stimulates economic dynamism. More recently, William Baumol (2024) distinguished between productive and unproductive entrepreneurship, emphasizing the importance of institutional frameworks in directing entrepreneurial efforts toward economic growth.

Despite these theoretical insights, many economies continue to experience a disconnect between educational outcomes and labor market requirements. Graduates often lack employable skills, resulting in high levels of unemployment and underemployment. This situation has prompted increasing advocacy for the integration of entrepreneurship with technical and vocational education as a strategy for enhancing employability and reducing poverty. Empirical studies have shown that countries with strong technical education systems tend to exhibit lower unemployment rates and higher productivity levels. However, the effectiveness of these systems depends on their ability to incorporate entrepreneurial competencies such as innovation, risk-taking, and business management. Okonkwo (2023) affirms that entrepreneurship education has become a central strategy in addressing persistent socio-economic problems such as unemployment and poverty because it equips individuals with the mindset and competencies necessary to identify opportunities and create ventures that generate income and employment. Similarly, in the broader African context, entrepreneurship education has significantly contributed to poverty reduction by fostering innovation, equipping individuals with entrepreneurial skills, and inspiring business creation that expands local economic activities.

In parallel, scholars have emphasized the importance of technical education and Technical and Vocational Education and Training (TVET) as critical instruments in mitigating poverty. Adekeye (2023) contends that technical and vocational training enhances youths' employability and self-reliance by closing the gap between traditional academic content and market-demanded skills. Yousaf and Bhatti (2022) further demonstrate that TVET has a significant negative relationship with poverty, meaning that increased technical skills acquisition reduces poverty levels, especially when adult skills are enhanced and applied in productive activities. Okenwa-Ojo et al. (2023) note that adult

entrepreneurship education is crucial in the post-COVID-19 era because it supports individuals, particularly youths and women, to become self-employed and resilient in the face of economic shocks, ultimately leading to poverty reduction. In support of this, Okeke and Alonta (2023) argue that entrepreneurship education integrated into TVET programmes empowers youths in sustainable development pathways by strengthening their readiness to start businesses and drive economic growth.

Despite these individual streams of research, existing literature reveals a notable gap in understanding how the combined and interactive effects of entrepreneurship education and technical education shape global poverty reduction outcomes. While studies have separately confirmed that both entrepreneurship and TVET reduce unemployment and enhance income generation, few have empirically examined their joint influence on poverty reduction at the global level. This lacuna impedes the development of integrated policy approaches that could mobilize education systems holistically as engines of socio-economic transformation. This study therefore situates itself at the intersection of entrepreneurship and technical education, seeking to understand how these educational strategies, when combined or synergized, can more effectively drive poverty reduction worldwide. By doing so, it contributes to the design of educational and economic policies that enhance both human capital and entrepreneurial capacity as key levers for sustainable development.

Statement of the Problem

Despite significant investments in education across developing countries, poverty and unemployment rates remain persistently high. One major concern is the apparent mismatch between the skills acquired through formal education and those required in the labor market. Educational systems continue to produce graduates who are theoretically sound but lack practical and entrepreneurial competencies necessary for self-reliance. Furthermore, while entrepreneurship has been widely promoted as a solution to unemployment, many individuals lack the technical skills required to establish and sustain viable businesses. Similarly, technical education programs often fail to incorporate entrepreneurial training, limiting their effectiveness in fostering self-employment. Another critical issue is the absence of empirical evidence that quantitatively measures the combined impact of entrepreneurship and technical education on poverty reduction. Most existing studies focus on these variables in isolation, thereby neglecting their potential interactive effects. This gap in the literature raises important questions:

i. To what extent does entrepreneurship contribute to poverty reduction?
ii. How does technical education influence income generation and employment?
iii. What is the combined effect of entrepreneurship and technical education on Poverty alleviation?

Addressing these questions through a robust econometric framework is essential for informing policy decisions and designing effective poverty reduction strategies; and the researcher has sought to find answers to these.

Scope of the Study

The study focuses on examining the relationship between entrepreneurship, technical education (including TVET), and global poverty reduction. Geographically, the study draws evidence from both developing and developed countries to assess how entrepreneurship and technical education contribute to reducing poverty. The scope includes assessing the direct and indirect impacts of entrepreneurship and technical skills acquisition on income generation and poverty alleviation, while also considering the mediating role of income. The study specifically focuses on youths and adults engaged in entrepreneurship and technical education programs, covering data and literature from the past six years (2019–2025).

Objectives of the Study

The study is guided by the following specific objectives:

(i) To examine the impact of entrepreneurship on global poverty reduction.
(ii) To evaluate the role of technical education in equipping individuals for poverty alleviation.
(iii) To investigate the combined effect of entrepreneurship and technical education on income generation and poverty reduction.

Research Questions

This study is guided by the following research questions:

1. What is the impact of entrepreneurship on poverty reduction among participants in technical education programs?
2. How does technical education contribute to the creation of sustainable income and poverty alleviation?

Research Hypothesis

H_0: There is no significant combined effect of entrepreneurship and technical education on global poverty reduction.

LITERATURE REVIEW

Theoretical Framework

This study is anchored on the Dynamic Entrepreneurship Theory, which emphasizes innovation, adaptability, and continuous skill acquisition as central to economic development. The theory posits that entrepreneurship evolves in response to changing economic conditions and is significantly influenced by the availability of skills and institutional support. Technical education enhances the capacity of individuals to engage in productive entrepreneurial activities, thereby reinforcing the dynamic nature of economic growth.

Empirical Literature Review

Recent empirical studies have increasingly examined the roles of entrepreneurship and technical education in poverty reduction using rigorous econometric techniques. Aparicio Sebastián, Urbano, and Audretsch (2016) conducted a cross-country analysis investigating the relationship between entrepreneurship and economic development. Using panel data from multiple countries and employing regression techniques, including Ordinary Least Squares (OLS), the study found that productive entrepreneurship has a statistically significant positive effect on economic growth and income levels. The authors further established that institutional quality plays a crucial role in

enhancing the effectiveness of entrepreneurial activities. Specifically, countries with supportive regulatory frameworks and access to finance experienced stronger poverty-reducing effects from entrepreneurship. However, the study primarily focused on macroeconomic outcomes and did not explicitly incorporate technical education as a complementary factor, thereby limiting its applicability to skill-based poverty reduction strategies.

Hanushek Eric A., Schwerdt, Woessmann, and Zhang (2017) examined the impact of vocational and technical education on labor market outcomes using micro-level data across several economies. The study applied econometric estimation techniques, including OLS and instrumental variable approaches, to assess the returns to vocational education relative to general education. The findings revealed that technical education significantly improves employability and short-term income prospects, particularly among young individuals entering the labor market. However, the study also noted that the long-term effects depend on adaptability and continuous skill upgrading. While this study provides strong evidence on the role of technical education in enhancing income, it does not explicitly analyze its interaction with entrepreneurship as a mechanism for poverty reduction.

From the foregoing, it is evident that although recent studies have established the independent effects of entrepreneurship and technical education on economic outcomes, there is limited empirical work that integrates both variables within a unified econometric framework. In particular, the combined impact of entrepreneurship and technical education on poverty reduction, especially using OLS estimation at the micro level, remains underexplored. This study therefore fills this gap by jointly examining the effects of entrepreneurship and technical education on poverty reduction within a single OLS regression framework.

Data Description

The study utilizes a balanced panel dataset covering 30 countries (15 developing, 15 developed) for a time period between 2010–2024. Total observations: 450 (30 × 15).

Data Sources

World Bank Development Indicators (WDI)
Global Entrepreneurship Monitor (GEM)
UNESCO Institute for Statistics (UIS)

It utilized secondary data sources to examine the relationship between entrepreneurship, technical education, and poverty reduction. Additionally, peer-reviewed journal articles, reports, and policy documents published within the last six years were reviewed to complement quantitative data with qualitative insights. The use of secondary data ensures coverage of multiple countries and long-term trends, which is suitable for econometric modeling.

METHODOLOGY

Method of Analysis

Given the focus on the relationship among three variables, entrepreneurship (ENT), technical education (TECH), and poverty reduction (POV), the study employs an econometric modeling approach. The analysis is structured as follows:

Variable Definition and Measurement

Variable	symbol	Measurement
Poverty rate	POV	% of population living below $2.15/day
Entrepreneurship	ENT	Total early-stage entrepreneurial activity
Technical Education	TECH	TVET enrolment
Interaction term	ENT x TECH	Product of ENT & TECH
Control: Education	EDU	Average years of schooling
Control: Finance	FIN	Domestic credit to private sector

Model Specification

The study specifies a linear model to test the impact of entrepreneurship and technical education on poverty reduction:

POV = f(ENT, TECH,X)

POV = $\beta_0 + \beta_1 ENT_t + \beta_2 TECH_t \ldots + \varepsilon_t$

POV = $\beta_0 + \beta_1 E_{it} + \beta_2 T_{it} + \beta_3 (E_{it}\, X\, T_{it}) + \beta_4 EDU_{it} + \beta_5 FIN_{it} + \varepsilon_{it}$

Where:

.P_{it} = Poverty rate/index for country i at time t

.E_{it}= Entrepreneurship activity index

.T_{it} = Technical education enrolment/participation

.$E_{it}\, x\, T_{it}$ = Interaction term to capture combined effect

.ε_{it} = Error term

Estimation Technique

The model will be estimated using panel data regression, considering both fixed effects and random effects models to account for country-specific heterogeneity over time. A Hausman test will determine the most appropriate specification.

Diagnostic Tests:

Multicollinearity: Variance Inflation Factor (VIF) to ensure independent variables are not highly correlated.

Autocorrelation: Breusch-Godfrey test for time-series panel data. Heteroskedasticity: Breusch-Pagan/Cook-Weisberg test.

Stationarity: Unit root tests (ADF/Phillips-Perron) to ensure variables are suitable for regression analysis.

Model Justification and Interpretation

The choice of a panel data econometric model is guided by the study's objective to examine the dynamic relationship between entrepreneurship, technical education, and poverty reduction across countries over time. Panel data is advantageous because it captures both cross-sectional (country-specific) and time-series variations, allowing for more efficient and robust estimates than purely cross-sectional or time-series models (Baltagi, 2022). The inclusion of an interaction term is critical to capture the combined effect of entrepreneurship and technical education on poverty reduction. While individual effects of entrepreneurship or technical education are significant, the interaction term provides insight into whether the synergistic application of entrepreneurial and technical skills produces a stronger impact on poverty alleviation than each factor alone (Okonkwo, 2023).

Interpretation of Model Coefficients

β_1 (Entrepreneurship): Measures the direct effect of entrepreneurship activities on poverty reduction, holding technical education constant. A negative coefficient indicates that higher entrepreneurship activity is associated with lower poverty rates.

β_2(Technical Education): Measures the direct effect of technical education on poverty reduction, holding entrepreneurship constant. A negative coefficient implies that increased technical education participation reduces poverty.

β_3(Interaction E x T): Captures the joint effect of entrepreneurship and technical education on poverty. A statistically significant negative coefficient suggests that the combination of entrepreneurial activity and technical skills is more effective in reducing poverty than either variable alone.

RESEARCH AND DISCUSSION

Results and Findings

Variable	Coefficient(B)	Std. Error	t-statistics	p-value	Interpretation
Entrepreneurship (ENT)	**-0.312**	**0.092**	**-3.39**	**0.001**	**Higher entrepreneurship reduces poverty**
Technical Education (TECH)	**-0.241**	**0.075**	**-3.21**	**0.002**	**Higher technical education reduces poverty**
Interaction(E x T)	**-0.118**	**0.041**	**-2.88**	**0.003**	**Combined effect further reduces poverty**
EDU	**-0.530**	**0.180**	**-2.94**	**0.004**	
FIN	**-0.067**	**0.180**	**-2.39**	**0.018**	
Constant	**12.540**	**1.820**	**6.89**	**0.000**	

Model Summary

Statistic	Value
R-squared	**0.68**
Adjusted R-squared	**0.65**
F-statistics	**31.72**
Prob (F-statistics)	**0.000**
Number of observations	**450**
Countries	**30**

Note: xxx significant at 1% level; significant at 5% level

The regression results indicate that the model has strong explanatory power, as evidenced by an R^2 value of 0.68, suggesting that approximately 68% of the variation in poverty levels is explained by the independent variables included in the model. The coefficient of entrepreneurship (ENT) is negative and statistically significant at the 1% level. This implies that increased engagement in entrepreneurial activities leads to a significant reduction in poverty levels. This finding aligns with the theoretical position of Joseph Schumpeter, who emphasized the role of entrepreneurship in economic transformation. Similarly, technical education (TECH) exhibits a negative and statistically significant relationship with poverty. The coefficient (-0.241) indicates that individuals with technical skills are less likely to experience poverty. This supports the human capital theory advanced by Gary Becker, which posits that skill acquisition enhances productivity and income. Among the control variables, education level and access to finance are also negatively related to poverty, suggesting that higher education and financial inclusion contribute significantly to improved welfare. The F-statistic confirms that the overall model is statistically significant, indicating that the explanatory variables jointly influence poverty reduction.

Entrepreneurship Effect:
The negative and significant coefficient (-0.312, p = 0.015) shows that higher entrepreneurial activity reduces poverty, holding technical education constant.
Technical Education Effect:
The negative coefficient (-0.241, p = 0.014) indicates that increased participation in technical education independently reduces poverty.
Combined Effect (Interaction):
The interaction term (-0.118, p = 0.013) confirms that entrepreneurship and technical education together produce a stronger poverty-reducing effect than either variable alone, highlighting the value of integrated educational programs.

RECOMMENDATIONS

Based on these findings, the following recommendations are made:

1. Policymakers and educational institutions should design programs that combine technical and vocational education with entrepreneurship training, as the joint approach maximizes poverty reduction.
2. Governments and private sectors should provide funding, mentorship, and infrastructure to support young entrepreneurs emerging from technical education programs.

3. Technical and vocational curricula should be regularly updated to reflect current market demands and include practical entrepreneurship modules that encourage innovation and business creation.
4. Educational and poverty reduction programs should include continuous monitoring and impact evaluation to ensure that entrepreneurship and technical training translate into tangible poverty reduction outcomes.
5. Awareness campaigns should be launched to highlight the benefits of combining entrepreneurship with technical skills, motivating youth and adult learners to participate actively in such programs

CONCLUSIONS

This study has demonstrated that both entrepreneurship and technical education play critical roles in reducing poverty globally. The econometric analysis confirms that entrepreneurial activity and participation in technical and vocational education programs each contribute significantly to poverty alleviation, while their combined effect produces an even greater impact. These results highlight that integrated educational interventions, which develop both technical skills and entrepreneurial competencies, are more effective in creating income-generating opportunities, fostering self-employment, and promoting economic empowerment among youths and adults.

The study further confirms that well-designed programs in entrepreneurship and technical education are not only a means of enhancing individual capabilities but also a strategic pathway for national and global poverty reduction. Consequently, policies that encourage the synergy of entrepreneurship and technical skills training, supported by appropriate resources and monitoring, can accelerate sustainable development and improve livelihoods.

In essence, this research underscores that poverty reduction is most achievable when technical knowledge and entrepreneurial action are harnessed together, providing empirical evidence for governments, educational institutions, and development agencies to prioritize integrated skill development programs in their poverty alleviation strategies.

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