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Factors Influencing Self-Employment Intentions of Technical and Vocational Education and Training (TEVET) Engineering Graduates in Ndola District, Zambia

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Abstract

The ongoing problem of graduate unemployment in Zambia, especially among Technical and Vocational Education and Training (TEVET) graduates has... This analysis documents the determinants of self-employment intentions among engineering graduates from Northern Technical College (NORTEC) in Ndola District, Zambia. Based on the Theory of Entrepreneurial Competency, this study uses concurrent mixed-method research design, combining quantitative survey data from 232 TEVET engineering students and qualitative data from focus group discussions. The research argues that self-employment intentions can be better understood by examining both contextual and psychological factors. In relation to Graduates, entrepreneurial skills gap, lack of adequate institutional support and negative self-perceptions are some of the factors that limit these graduates from pursuing an entrepreneurial career. In contrast, demographic and social variables are insignificant. This study highlights the importance of policy interventions that foster entrepreneurship education, provide startup capital, and support the development of a vibrant entrepreneurial ecosystem within Zambia's TEVET institutions. The results will inform the overall discourse on self-employment among the youth and have practical implications for educational policymakers, training institutions, and programs for developing entrepreneurship.

Keywords: Self-employment intentions, TEVET, engineering graduates, entrepreneurship education, Ndola District, Zambia

1. Introduction

Tertiary education, particularly in most African developing economies no longer carries the assurance for guaranteed employment leading high unemployment rates of graduates (Mahlaole & Malebana, 2021; Mwiya et al., 2017). Thus, the notion of self-employment creation has increasingly become of interest and gained prominence in the past two decades as a strategy to address the ever-increasing challenges of unemployment and poverty of youths and graduates (Ajani, Khumatake & Gamede, 2023; Miço & Cungu, 2023). Globally, self-employment intention has been considered a road towards attainment of desirable and inclusive socio-economic development in developing economies facing high levels of unemployment of graduates (Kisubi, Korir & Bonuke, 2021). This is premised on the belief that self-employment of graduates results in creation of new business enterprises which offer employment opportunities (Faloye & Olatunji, 2018; Patel & Wolfe, 2020).

In this regard, in order to endorse self-employment of graduates, entrepreneurship education and training through vocational training and education has been integrated in existing education curricula in most countries (Nowiński et al., 2019). Over the past three decades, Zambia has been grappled with high levels of unemployment and poverty particularly among youths (Betran, 2022; Mileji, Lubbungu & Magasu, 2023; Tounkara et al., 2020). It is noted that in Zambia, many graduates have been finding themselves unemployed owing to lack of work experience following graduation from higher education institutions (HEIs) including universities and TEVET colleges (Chibanta, 2021; Mwamba, Musonda & Daka, 2021). Lack of work-related experience among graduates has been a common complaint by most employers in Zambia (Aroumougame, 2021). In addition to lack of work-related experience, it has also come to light that lack of formal job opportunities in Zambia is the credo of the challenges facing graduates in the country (Mwamba et al., 2021; Mwange et al., 2025). The challenges have translated into poor socio-economic welfare of most graduates in Zambia consequently resulting high crime rates, moral decadence and poverty (Mululu, 2023; Mwamba et al., 2021).

In the efforts to address these, there have been calls and initiatives to promote self-employment creation including provision of entrepreneurship education to students including TEVET students. However, the rate of self-employment creation among TEVET graduates tends to be low contributing to the increase in youth unemployment in Zambia. However, there is lack of empirical evidence on the factors influencing self-employability of TEVET graduates in the context of Zambia. This is the gap in literature which motivated the researcher to determine the factors inhibiting or facilitating self-employability of engineering TEVET graduates from the Northern Technical College (NORTEC) located in Ndola district of Zambia. The research pursued to answer the research question: "What factors influence self-employability for TEVET engineering students in Ndola district, Zambia?"

The subsequent section presents the concise review of theoretical, conceptual and empirical literature followed by the methodology of the study, results and discussion and conclusions and recommendations.

2. Literature Review

2.1. Theoretical framework

The research was anchored on the Theory of Entrepreneurial Competency propounded by Bird (1988). The theory posits that intention is among the two distinct key inputs for entrepreneurship, the other input being opportunity (Mishra & Zachary, 2014). Intention is directly linked to venture creation according to the theory (Bird, 2019a). According to the theory, both personal and contextual factors act as predictor of entrepreneurial intentions (Debelo, 2017; Pepple & Enuoh, 2020). In other words, the theory states that competencies refer to individual characteristics such as skills, knowledge or capabilities required by an individual to perform a certain task like venture creation (Bird, 2019). The theory was found of great importance to this study as it aided in explaining the factors which predict self-employment intentions of TEVET engineering students.

2.2. Empirical review

Many factors which influence entrepreneurial self-employability of graduates have been identified in the literature and categorised as social, contextual, political, cultural, demographic, psychological, environmental and economic factors. Existing studies such as Japheth and Dimo (2019) have shown challenges faced by TEVET graduates in creating self-employment. The study by Serah (2015) found that entrepreneurship education, perceived desirability and previous entrepreneurial experience are significant predictors for self-employment. Mabunda and Frick (2020) found that negative stakeholder perceptions, lack of career guidance well as limited industry awareness influence self-employability of TEVET graduates in South Africa.

Several previous studies have also reported that factors that influence self-employability include limited policies, limited or lack of support, limited entrepreneurial knowledge, exposure and experience, lack of confidence, reluctance to take risks, fear of failure, inadequate resources and insufficient start-up capital (Fayolle & Gailly, 2015; Hoogendoorn, Van der Zwan & Thurik, 2019; Noel, 2023). In the same vein, Minola, Criaco and Obschonka (2016) reported that factors such as age and culture significantly influence self-employment motivations. Similarly, Nintunze (2023) also found demographic factors such as age and education to have significant influence on the decisions to become self-employed.

On the other hand, feasibility beliefs such as locus of control, lack of self-confidence and entrepreneurial self-efficacy, need for achievement and locus of control and desirability beliefs such as attitudes towards entrepreneurship are among the individual motivational factors for self-employment decisions (Caliendo, Fossen & Kritikos, 2014; Minola et al., 2016). The German-based study by Caliendo et al. (2014) found that demographic factors such as gender, age, marital status and disability are significant factors for self-employment decisions and intentions. Baluku, Onderi and Otto (2021) found that the main factors that contribute to self-employment intentions include attitudes towards entrepreneurship.

Perera and Priyanath (2022) also revealed that self-efficacy and attitudes are significant factors that influence self-employment intentions. In addition, Ayalew and Zeleke (2018) found that entrepreneurial attitudes, self-confidence, social influence and family background significantly predict students' self-employment intentions. Al-Qadasi, Zhang and

Al-Jubari (2021) also found individual attitudes, perceived behavioural control and perceived social norms positively influence self-employment intentions.

However, Ayalew and Zeleke (2018) revealed that demographic factors such as marital status, age and gender and socio-economic factors such as the external macroeconomic environment were insignificant predictors of self-employment intentions. Dubey (2022) also found insignificant effects of self-efficacy, entrepreneurial attitudes, risk-taking propensity and social networking on self-employment intentions.

From the literature review above, it can be deduced that not many research studies have considered the factors that influence self-employment intentions of TEVET students as most of the previous studies have focused on university students. In addition, the existing literature has also shown mixed and inconclusive findings pertaining the factors which influence self-employability of students. Thus, leaving a significant gap in the body of knowledge and an opportunity for the present research to fill the existing gap in knowledge by explore factors influencing self-employment intentions of TEVET graduates in Ndola district in Zambia.

3. Methodology

3.1. Research Design and Approach

The study employed the concurrnet mixed-method design. Given this, the research employed the pragmatism research philosophy given that both quantitative and qualitative research methods were used. The ontology of the pragmatism philosophy is that there is no single reality as reality is both objective and subjective. The survey and case research strategies were employed. The cross-sectional descriptive research design was found appropriate in this mixed method research.

3.2. Study site

The study area for this study was NORTEC in Ndola district located in the Copperbelt Province in Zambia. NORTEC is one of the leading institutions offering TEVET in engineering programmes in Zambia (MOTS, 2023). In addition, NORTEC has been found the most suitable study area for the study as EE programmes have been meant mandatory to all TEVET students including engineering students (NORTEC, 2024).

3.3. Sampling

The target population for this study include final year TEVET engineering students from the NORTEC in Ndola district, Zambia. According to NORTEC (2024), there are currently 550 final year students enrolled in various engineering programmes. To estimate the sample size, the Yamane's (1973) sample size determination formula was utilized.

$$n = \frac{N}{1 + Ne^2} \dots \dots (1)$$

According to Yamane (1973), N, e and e represent population size, tolerable sampling error margin and sample size. In this study, based on the population size of 550 and sampling error margin of 5% based on the 95% confidence level, the minimum sample size for the study was found to be 232. This sample was reached through random sampling. On the other hand, a sample of 20 students and 10 lecturers for engineering and EE courses were purposively selected to participate in the focus group discussions.

3.4. Data collection

Primary data was gathered through structured questionnaires and focus group discussions. The close-ended questions were based on a 5-point Likert scale ranging from 1 representing strongly disagree to 5 representing strongly agree. The questionnaire was derived employing scales from literature. For instance, self-employment intention scale was adapted from Alhaji (2015), Debelo (2017) and Mamman (2019). Questionnaires were physically distributed by the researchers with the help of trained research assistants. A total of three focus groups each including ten participants were conducted at a hall at NORTEC.

3.5. Data analysis techniques

Quantitative data was analysed using descriptive, Pearson Chi-square test and exploratory factor analyses whilst qualitative data was analysed using the inductive content analysis technique. SPSS version 27 was employed for carrying out quantitative analyses.

3.6. Ethical issues

Throughout this research, the researcher observed the required ethical standards per the applicable ethical policies and accepted all ethical responsibility.

4. Results and Conclusions

4.1. Profile of respondents

A total of 61.1% of the respondents were males whilst 38.9% were females. In terms of age, 74.4% were aged between 18 and 30 years whereas 20.2% were aged from 31 to 40 years. The largest proportion of the respondents (35.0%) were students studying metal fabrication followed by 16.7% who were heavy equipment engineering students. Additionally, most of the respondents making 56.2% of the sample highlighted that they were studying for diplomas whereas 20.7% were studying towards advanced certificates.

4.2. Factor analysis results

The study carried out the exploratory factor analysis using the PCA technique to reduce the number of factors. Table 1 shows the results for the Kaiser-Meyer-Olkin (KMO) test and the Bartlett's test of sphericity to indicate feasibility of factor analysis.

Table 1: KMO and Bartlett's test results

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.718
Bartlett's Test of Sphericity	Approx. Chi-Square	2277.51
	d.f.	153
	Sig.	.000

The results in Table 1 show a KMO statistic of 0.718 which is significantly greater than 0.7 implying sampling adequacy and suitability of factor analysis. In addition, the p-value of 0.000 for the Bartlett's test for sphericity indicate significance of the Chi-square statistic of 2,277.51. These results show feasibility and applicability of factor analysis. The results of the total variance explained are reported in Table 2.

Table 2: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.852	26.956	26.956	4.852	26.956	26.956	3.216	17.865	17.865
2	2.597	14.429	41.385	2.597	14.429	41.385	2.739	15.216	33.081
3	1.599	8.885	50.270	1.599	8.885	50.270	2.480	13.776	46.857
4	1.365	7.584	57.854	1.365	7.584	57.854	1.925	10.697	57.553
5	1.267	7.036	64.890	1.267	7.036	64.890	1.321	7.337	64.890
6	.990	5.501	70.391						
7	.953	5.295	75.686						
8	.828	4.599	80.285						
9	.773	4.295	84.579						
10	.623	3.461	88.041						
11	.500	2.779	90.819						
12	.430	2.387	93.207						
13	.394	2.191	95.398						
14	.311	1.728	97.126						
15	.279	1.551	98.677						
16	.188	1.047	99.723						
17	.037	.206	99.930						
18	.013	.070	100.000						

Extraction Method: Principal Component Analysis.

Table 2 reveals that from the eighteen (18) items exposed to the EFA, only five factors were extracted using the PCA technique. These five factors had eigen-values greater than 1 as also. All the extracted five factors accounted for 64.89% of the total variance explained (TVE). Factor 1 constituted about 17.9% of the TVE whilst Factor 2 constituted about 15.2% of the TVE. Factor 3, Factor 4 and Factor 5 constituted about 13.8%, 10.7% and 7.3% of the cumulative TVE of 64.89% respectively.

To understand the constituents of the extracted five factors, the component rotation matrix shown in Table A1 was generated basing on the principal component analysis (PCA) extraction method and the Varimax rotation method. The variable of gender was discarded at it had factor loadings less than 0.5 across the five extracted factors whilst lack of practical experience was discarded as it reported factor loadings of less than 0.5 across all the extracted factors.

Factor 1 contained four items namely lack of skills for creating self-employment due to short duration of EE programs, lack of capital to start own businesses, mismatch between skills acquired and industry demands and lack of entrepreneurial

skills due to poor entrepreneurship education. This factor was named contextual factors.
Factor 2 contained four items namely lack of an entrepreneurship institutional framework to support self-employment and startups, lack of career guidance for students, absence of guidelines for the business start-up process and limited institutional and government support. This was therefore named institutional factors.
In addition, Factor 3 was found to contain three items which are fear of failure, lack of self-confidence and negative attitudes towards self-employment. These three items were found representing individual psychological factors.
Factor 4 contained three items with factor loadings of at least 0.5. These items were lack or absence of family support, lack of social networking and societal attitudes towards self-employment. These items making Factor 4 were found representing social factors.
The last factor extracted (Factor 5) contained two items namely age and marital status. These were categorized as demographic factors.
The research proceeded in carrying out the Pearson Chi-square test to determine the significance of the association between the five factors and self-employment intentions. The results are reported in Table 3.

Table 3: Chi-square test results

Variables	Chi-square statistics
Contextual factors and self-employment intentions	$\chi2$ = 307.55; d.f. = 78; Sig. = 0.000
Institutional factors and self-employment intention	$\chi2$ = 148.25; d.f. = 78; Sig. = 0.027
Psychological factors and self-employment intention	$\chi2$ = 468.17; d.f. = 91; Sig. = 0.000
Social factors and self-employment intentions	$\chi2$ = 112.58; d.f. = 91; Sig. = 0.062
Demographic factors and self-employment intentions	$\chi2$ = 22.48; d.f. = 26; Sig. = 0.662

From Table 3, the Chi-square statistic of 307.55 statistically significant at 5% indicate that contextual factors significantly influence self-employment intentions of the TEVET engineering students from NORTEC. In addition, the Chi-square test results ($\chi2$ = 148.25; d.f. = 78; p = 0.027) show that institutional factors significantly influenced self-employment intentions of the engineering students from NORTEC. Psychological factors have significant influence on self-employment intentions of TEVET students as supported by the Chi-square statistic of 468.171 which is statistically significant at 5% level (p=0.000). However, the Chi-square test results ($\chi2$ = 112.58; d.f. = 91; p = 0.062) revealed that social factors have insignificant influence at 5% level on self-employment intentions. The results also indicate that demographic factors are insignificant factors that influence self-employment intentions of engineering students from NORTEC.
The findings were also supported by the qualitative findings from the FGDs as evidence from the following excerpts:

> *"Lack of financial resources remains one of the economic challenges faced by engineering graduates from TEVET institutions such as NORTEC. This lack of financial resources to start own businesses result in the graduates seeking employment in established companies rather than creating self-employment"* (Participant 1; FGD3; 15/09/2024).

> *"No one can argue that business startups require a lot of money. Hence, so much as we were taught entrepreneurship at NORTEC, there is are no clear government policies on how to fund TEVET graduates who come up with good business ideas to be put into practice. This means that TEVET graduates with good business ideas remain on paper such that they continue searching for jobs in already established business enterprises"* (Participant 5; FGD2; 13/09/2024).

> *"Even though we have studied entrepreneurship at NORTEC, I have realized that we lack the practical skills. In the absence of these skills, some of us have feared to take risks by venturing into businesses where the fear stems from fear of failure and negative attitudes towards starting own businesses"* (Participant 3; FGD1; 13/09/2024).

> *"Based on my personal experiences, unfavourable societal attitudes and perceptions towards self-employment often undermine the potential of most graduates thereby leading to lack of self-confidence in self-employability prospects. This form of stigma affects individual student's aspirations towards venturing into business. In short, the fear of social ostracism prevents most students from pursuing business opportunities, which are crucial for self-employment creation in the Zambia's economy".* (Participant 8; FGD2; 13/09/2024).

The findings show that the main factors with influence on self-employment intentions of the TEVET engineering students at NORTEC can be categorized into contextual, institutional and psychological factors. The findings concur with the Theory of Entrepreneurial Competency which holds that both personal and contextual factors act as predictor of entrepreneurial intentions (Debelo, 2017; Pepple & Enuoh, 2020). The findings also support Mabunda and Frick (2020) found that contextual and institutional factors such as negative stakeholder perceptions, lack of career guidance and limited industry awareness influence self-employability of TEVET graduates in South Africa. Previous studies have also established factors including limited policies, limited or lack of support, limited entrepreneurial knowledge, exposure and experience, lack of confidence, reluctance to take risks, fear of failure, inadequate resources and insufficient start-up capital

(Fayolle & Gailly, 2015; Hoogendoorn, Van der Zwan & Thurik, 2019; Noel, 2023).
However, demographic and social factors were found to have no significant influence. Ayalew and Zeleke (2018) also revealed that demographic factors are insignificant predictors of self-employment intentions. Dubey (2022) also found insignificant effects of self-efficacy, entrepreneurial attitudes and social networking on self-employment intentions.

5. Conclusion and Recommendations

Conclusions

The findings of the study led to the conclusion that there are several factors which influence self-employability of graduates. The factors include contextual factors, institutional factors and individual psychological factors. Based on the findings, the study also draws the conclusion that there are multiple determinants for self-employment intentions of engineering students.

Recommendations

The study recommends the need for support from the government through provision of capital for engineering students with entrepreneurial intentions so that they can launch their startups and create self-employment. The study recommends the TEVET institutions such as NORTEC to ensure provision of practical experience through field-based learning and provision of skill-based training rather than theoretical teaching.

Implications

Implications to theory

The study made significant contributions to theory by bridging the gaps in literature. The findings of the study also contribute to theories such as the Theory of Entrepreneurial Competency. In other words, the research made significant contributions to the existing literature on self-employment creation.

Implication to practice

The research made significant contributions to practice. The findings can be useful in guiding and directing self-employment creation among engineering students.

Limitations and areas for further research

The study was focused to engineering students from NORTEC such that findings lack generalizability to other TEVET students in Zambia. Basing on the limitations, further studies may be conducted targeting students from other disciplines. Similar researches can also be conducted in higher educational institutions such as universities.

Conflict of Interest

The authors declare that they have no conflicting interests.

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Data availability statement

The data used to support the findings of this study are available from the corresponding author upon request.

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Appendices

Table A1: Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
Age					.583
Marital status					.683
Lack of skills for creating self-employment due to short duration of EE programs	.829				
Lack of capital to start own businesses	.756				
Mismatch between skills acquired and industry demands	.827				
Lack of entrepreneurial skills due to poor entrepreneurship education	.737				
Lack of an entrepreneurship institutional framework to support self-employment and start ups		.609			
Lack of self-confidence			.855		
Negative attitudes towards self-employment			.813		
Lack of career guidance for students		.822			
Absence of guidelines for the business start-up process		.775			
Limited institutional and government support		.790			
Fear of failure			.816		
Lack or absence of family support				.664	
Lack of social networking				.775	
Societal attitudes towards self-employment				.836	
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.					
a. Rotation converged in 8 iterations.					