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Does entrepreneurship education invigorate opportunity recognition and exploitation?

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Background: Entrepreneurship is essential for economic growth and innovation, and educational institutions, particularly technical and vocational education and training (TVET) colleges, play a pivotal role in nurturing entrepreneurial skills.

Aim: This study examined the relationship between entrepreneurship education, opportunity recognition and exploitation.

Setting: The research was conducted among the students at the selected TVET college in the North West province, South Africa. The study focussed on the students enrolled in N5 to N6 levels under business management and marketing management programmes because they have a background in entrepreneurship and business management.

Methods: A quantitative research design was employed, utilising a structured questionnaire. A non-probability sampling technique was used, and the sample size consisted of 151 completed questionnaires. Data were analysed using Statistical Package for the Social Sciences and Smart-PLS software to identify correlations between the constructs.

Results: The findings indicate a positive correlation between the quality of entrepreneurship education and the ability to recognise and exploit opportunities. The results imply that the students who receive comprehensive entrepreneurship education, demonstrate a higher propensity to identify and act on entrepreneurial opportunities.

Conclusion: The results emphasise the importance of entrepreneurship education in equipping TVET college students with skills critical for opportunity recognition and exploitation. Efforts should be vested in the integration of entrepreneurship education into other non-business-related study programmes.

Contribution: This research adds to literature by providing empirical evidence on the impact of entrepreneurship education in TVET colleges, emphasising the importance of collaboration between educational institutions, businesses and policymakers in fostering entrepreneurial development.

Keywords: entrepreneurship; entrepreneurship education; opportunity recognition; opportunity exploitation; TVET college.

Introduction

Technical and vocational education and training (TVET) colleges hold a unique position within the educational landscape, often acting as incubators for developing a diverse pool of talent, including aspiring entrepreneurs (Winberg & Nomgauza 2023). However, the question of whether the curricula and pedagogical approaches employed within TVET colleges effectively foster entrepreneurial skills remains a significant concern (Sibanda & Naidoo 2023). According to Sibanda and Naidoo (2023) in the 21st century, students face increasingly complex and ever-evolving challenges that require innovative and entrepreneurial solutions, highlighting the importance of entrepreneurship as a critical skill. Entrepreneurship plays a crucial role in fostering economic development, reducing unemployment and driving innovation (Opute et al. 2021; Sagar et al. 2023). In South Africa, where youth unemployment rates remain alarmingly high, entrepreneurship education offers a potential solution by equipping young people with the skills to identify and exploit business opportunities (Ijeoma & Ndedi 2021; Radebe 2019). Technical and vocational education and training colleges are increasingly recognised as key platforms for providing such education (Sibanda & Naidoo 2023). The role of education in shaping entrepreneurial outcomes has garnered attention in both academic and policy circles in recent

years (Gianiodis & Meek 2020). Entrepreneurship education, defined as the structured provision of knowledge, skills and attitudes that promote entrepreneurial activities, is believed to contribute to the development of entrepreneurial intentions and behaviours (Almawishir & Messen 2021). Such education is not only concerned with technical skills but also focusses on fostering creativity, resilience and problem-solving abilities – skills that are vital in recognising and exploiting entrepreneurial opportunities (Ndou 2021). However, the effectiveness of entrepreneurship education in fostering opportunity recognition and exploitation remains under-researched, particularly within the TVET sector.

Within the context of TVET colleges, entrepreneurial education has the potential to bridge the gap between opportunity recognition and opportunity exploitation by providing students with both the mindset and the practical skills necessary to act on identified opportunities (Cui, Sun & Bell 2021; Ratten & Jones 2021). There is a growing recognition of the importance of integrating entrepreneurial training within institutions of higher learning, specifically in TVET colleges (Ncube & Matlala 2024). This integration has the potential to generate employment opportunities for individuals, thereby serving as a catalyst for industrialisation and technological advancement in the contemporary era (Gamede & Uleanya 2017). Numerous studies have determined that the provision of entrepreneurship education contributes to enhancing the self-confidence in entrepreneurial abilities among both students (Kubberød & Pettersen 2017; Nowiński et al. 2019; Sánchez 2013) and the broader public (Kerrick, Cumberland & Choi 2016). Students who receive entrepreneurship education demonstrate greater motivation for entrepreneurship compared to their counterparts (Solesvik 2013). Research indicates that entrepreneurial education plays a significant role in shaping entrepreneurial intentions, enhancing the knowledge and skills of individuals (Almawishir & Messen 2021).

Despite the growing body of literature on entrepreneurship education, there is limited empirical evidence on its impact within the South African TVET context (Ploum et al. 2018). This study aims to fill this gap by investigating the influence of entrepreneurship education on TVET students' ability to recognise and exploit entrepreneurial opportunities. Following the introduction, this article outlines the study's objectives and provides a review of the relevant literature. Next, it addresses the theoretical framework and offers a detailed description of the methods used for data collection and analysis. The results are then presented and discussed in relation to the existing literature. Finally, the conclusion draws insights from the findings and suggests directions for future research.

Objectives of the study

- To determine the relationship between entrepreneurial education and opportunity recognition
- To establish the correlation between entrepreneurial education and opportunity exploitation

Literature review

Entrepreneurship education has emerged as a critical component in the development of human capital, particularly within TVET colleges (Kuratko & Morris 2018; Ndou 2021). These institutions play a vital role in equipping students with the skills and knowledge necessary to thrive in an increasingly competitive and dynamic economy (Winberg & Nomgauza 2023). The focus on entrepreneurship education within TVET colleges is driven by the recognition that fostering entrepreneurial competencies is essential not only for individual career success but also for broader economic development (Linton & Xu 2021; Martin, McNally & Kay 2013). This literature review explores the theoretical underpinnings of entrepreneurship education through the lens of the human capital theory (HCT) and examines its practical implications within the context of TVET institutions.

This study is significant as it examines the role of entrepreneurship education in fostering human capital by enhancing students' capability to identify and capitalise on business opportunities. Literature highlights opportunity recognition and exploitation as essential components of entrepreneurial success. Although TVET colleges globally are integrating these concepts into their curricula, the effectiveness of such educational initiatives remains a subject of debate, particularly in resource-limited environments such as South Africa. Through a critical analysis of existing research, this review seeks to provide a comprehensive understanding of how entrepreneurship education influences the entrepreneurial mindset of TVET students and the challenges that impede its effective implementation.

Human capital theory

One of the foundational theories that explains the role of entrepreneurship education is the HCT. This theory suggests that individuals accumulate valuable skills, knowledge and abilities through education and training, which, in turn, enhance their productivity and economic potential (Becker 2009; Linton & Xu 2021). Within the context of entrepreneurship education, the theory posits that the development of entrepreneurial skills – such as opportunity recognition, risk management and innovation – contributes to the formation of human capital, which is critical for successful business ventures. Entrepreneurship education provided by TVET colleges plays a crucial role in developing students' human capital by equipping them with the essential knowledge and skills needed to recognise and capitalise on business opportunities within their respective industries. The link between entrepreneurship education and human capital development is particularly important in developing economies, where young people often lack the skills needed to enter the labour market or start their own businesses. Within the context of this study, the HCT highlights the role of education in building the skills and knowledge needed for business success.

Entrepreneurship education in technical and vocational education and training colleges

Entrepreneurship education has become an essential part of the curriculum in TVET colleges worldwide, aiming to equip students with the skills necessary to thrive in a competitive and dynamic economy. Within these institutions, entrepreneurship education focusses on nurturing an entrepreneurial mindset, fostering innovation and building the capacity to recognise and exploit business opportunities (Kuratko & Morris 2018; Linton & Xu 2021). It plays a pivotal role in bridging the gap between vocational skills and business acumen, preparing students to either start their own businesses or apply entrepreneurial thinking in existing organisations (Kuratko 2020; Ndou 2021). The design of entrepreneurship education in TVET institutions typically integrates both theoretical and practical learning. Theoretical components cover fundamental business concepts such as finance, marketing and strategic planning. On the other hand, practical elements – such as simulations, internships and hands-on projects – allow students to engage with real-world business scenarios, enhancing their problem-solving and decision-making capabilities (Jones, Penaluna & Matlay 2019; Sibanda & Naidoo 2023). This blend of theory and practice is critical for developing the entrepreneurial competencies that students need to navigate the challenges of starting and managing a business.

Despite the efforts of integrating theory and practice, several challenges continue to hinder the effective implementation of entrepreneurship education within TVET institutions, particularly in South Africa. One of the primary challenges is resource constraints. Many TVET institutions operate under tight budgets, limiting their ability to offer comprehensive entrepreneurship programmes that include the necessary tools and resources for practical learning (Nkondo & Motsepe 2021; Sibanda & Naidoo 2023). This lack of resources often affects the quality of education, especially in terms of providing access to technology and real-world business experiences.

Opportunity recognition

Opportunity recognition involves an individual's capacity to determine, uncover or formulate patterns and ideas. Research indicates that this cognitive phenomenon plays a role in an individual's decision-making process in entrepreneurship (Hassan et al. 2020). Manesh and Rialp-Criado (2019) found, in their study, that entrepreneurship education strengthens the impact of opportunity recognition on entrepreneurial intention. According to Shane and Venkataraman (2000), opportunity recognition is a core focus of entrepreneurship research, as the entrepreneurial journey begins with identifying a potential business idea that can be explored and transformed into a new product, service or process. Consequently, the idea of opportunity recognition has become a key concept in entrepreneurship studies (Filser et al. 2023; Hoang et al. 2022; Khanin et al. 2022).

Opportunity exploitation

Once an opportunity is recognised, the next crucial step is opportunity exploitation, which involves taking action to realise the identified potential. The transition from recognition to action is a complex process that includes decision-making, resource allocation and risk management (Kuckertz et al. 2017; Linton & Xu 2021). Opportunity exploitation refers to the capacity to improve, extend and apply the existing organisational processes and routines, competencies and technology to create new or improved products or services, as needed by the market (Zobel 2017). Opportunity exploitation facilitates knowledge acquisition and enables acting upon the knowledge to produce tangible results. Ultimately, opportunity exploitation entails enabling implementation, applying assimilated capabilities and combining resources to unlock commercial potential (Mathafena & Msimango-Galawe 2023).

Based on insights from the literature review, the following hypotheses are proposed. The conceptual model for the study is illustrated in Figure 1.

Entrepreneurship education and opportunity recognition

Entrepreneurship education plays a fundamental role in enhancing individuals' ability to recognise and capitalise on business opportunities (Othman et al. 2020b). By imparting essential knowledge and fostering critical skills, such programmes equip students with the tools necessary to identify viable market gaps and innovative solutions (Adejoke 2025; Sarkar & Jena 2022). Nabi et al. (2017) found that entrepreneurship education positively influences students' entrepreneurial intentions and their capacity for opportunity identification. Similarly, Guo et al. (2017) indicates that opportunity recognition significantly mediates the relationship between entrepreneurial orientation and performance of small and medium-sized enterprises. These findings suggest that structured educational interventions in entrepreneurship can effectively cultivate an opportunity-oriented mindset, thereby facilitating the successful launch and sustainability of new ventures. Hence, the following hypothesis is formulated:

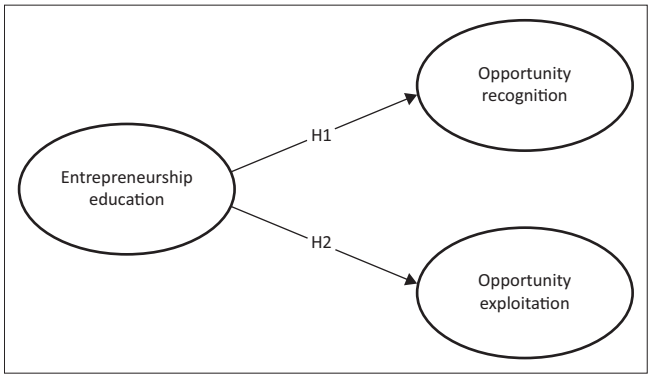


FIGURE 1: Conceptual model and hypothesis development.

H1: Entrepreneurial education has a positive effect on opportunity recognition

Entrepreneurship education and opportunity exploitation

The contribution of entrepreneurship education has been identified to prepare individuals with the necessary skills and knowledge to identify and exploit business opportunities effectively (Boldureanu et al. 2020; Sánchez 2013). Through nurturing an entrepreneurial mindset, such education enhances one's ability to recognise potential ventures and navigate the complexities of starting and managing a business (Kuckertz et al. 2017). Experiential learning approaches within entrepreneurship education have been shown to significantly improve opportunity identification and exploitation capabilities (Corbett 2005). Moreover, the development of self-regulation and decision-making heuristics through targeted education further facilitates the successful exploitation of identified opportunities (Bryant 2007). Based on the assertion, the following hypothesis is proposed:

H2: Entrepreneurial education has a positive effect on opportunity exploitation

Research methods and design

The study adopted a positivist paradigm that allowed for the quantitative and empirical nature of the study. The study aimed to investigate the relationship between entrepreneurship education, opportunity recognition and exploitation at the selected TVET college in the North West province of South Africa. The positivist philosophy aligns with the hypothetical-deductive scientific model, which involves validating pre-established hypotheses through testing by defining variables and measures. The outcomes of these hypothesis tests are then utilised to inform and advance scientific knowledge (Park, Konge & Artino 2020).

The data were collected through a structured questionnaire with measurement items on entrepreneurship education, opportunity recognition and exploitation. The study was conducted in the TVET college sector, with a focus on the Vuselela TVET college, in the North West province of South Africa. The college consists of five campuses and only three are offering business studies. The TVET college offers Entrepreneurship as a subject to the Business Studies students enrolled for Business Management (N4–N6) and Marketing Management (N4–N6).

Study population and sampling strategy

The study population consisted of 240 students from the Vuselela TVET college, on the three campuses offering business studies programmes. The study was conducted using a sample of students studying Business Management and Marketing Management at the N5 and N6 levels of study. Students doing N4 were excluded because they do not have Business Management and Marketing Management background. The sample size included students registered for full-time and part-time studies.

A non-probability sampling method, that is the convenience sampling technique, was used to collect the cross-sectional data. The questionnaires were distributed to the students by the researchers during class time at the three campuses of Vuselela TVET college. Out of the total of 240 questionnaires distributed to students, 151 questionnaires were completed and used for data analysis.

Data collection

The study used valid measurement items previously employed in entrepreneurship studies. The measurement items were adopted from the previous studies on entrepreneurship education, opportunity recognition and opportunity exploitation. Questionnaires were distributed to the students during class time at the three campuses offering Business Studies. The process of data collection was administered by the researchers involved in the study. All the completed questionnaires were captured in MS Excel and later imported to Statistical Package for the Social Sciences (SPSS) (IBM Corp., Armonk, NY, United States) and SmartPLS (SmartPLS GmbH, Bönningstedt, Germany) for processing. Confirmatory factor analysis (CFA) was used to ensure the reliability and validity of all the constructs and structural equation modelling (SEM) was used to test the proposed hypotheses.

Ethical considerations

Ethical approval to conduct this study was obtained from the University of Johannesburg School Research Ethics Committee (JBSREC) (No. JBSREC2024194). In addition, the Principal of Vuselela TVET college granted permission to the researchers to conduct the study at the college. Respondents were comprehensively briefed on the study's purpose, the voluntary nature of their participation and their right to withdraw at any point without any repercussions. Prior to data collection, informed consent was obtained from each participant. The consent form clearly detailed the study's objectives, methodology and potential benefits. Confidentiality and anonymity were rigorously upheld throughout the research process. Access to the data was restricted exclusively to the research team, with all data securely stored and utilised solely for the purposes of this study. To further safeguard participants' privacy, all responses were aggregated and findings were reported in a manner that ensured individual participants could not be identified.

Results

A structured, self-administered questionnaire was used to gather data, consisting of two main sections. Section A focussed on gathering demographic information about the participants, while Section B contained questions related to both dependent and independent variables. The items for measurement were adapted from previous studies in the areas of entrepreneurship education, opportunity recognition and opportunity exploitation. Entrepreneurship education

was measured using an eight-item scale, adapted from Linan and Chen (2009) and Gill (2019). A five-item scale, adapted from Kuckertz et al. (2017), was used to assess opportunity recognition, while opportunity exploitation was measured with a four-item scale adapted from Kuckertz et al. (2017). Data were collected using a 5-point Likert scale, where respondents indicated their level of agreement with each statement, ranging from 1 (strongly disagree) to 5 (strongly agree).

Demographics analysis

Table 1 presents the demographic breakdown of the data collected in the study. Demographic information was gathered from 151 participants using a structured questionnaire, which included details regarding campus location, age, gender, race, level of study and course of enrolment. Among the respondents, 58.3% were from the Klerksdorp Campus. In terms of age, most respondents (70.2%) fell within the 21–30 years age range. The gender distribution comprised 68.2% females (103 respondents). The racial proportion is 90.1% black people, 8.6% Coloured people, and 0.7% white people and Indian people. Regarding the level of study, 67.5% were enrolled in the N5 level. In addition, most participants (78.8%) were enrolled in Business Management courses.

Reliability and validity

The reliability and validity of the measurement tools were assessed using Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE) (Fornell & Larcker 1981; Hair et al. 2010). Reliability refers to the internal consistency of a group of questions intended to measure a particular variable. An acceptable level of reliability is indicated by alpha and CR values of 0.7 or higher and an AVE of at least 0.5 (Hair et al. 2010). The results of the reliability analysis for this study are presented in Table 2. Convergent validity evaluates how well a set of questions accurately measures the intended variable (Hair et al. 2010). Satisfactory convergent validity and internal consistency are demonstrated by factor loadings of 0.5 or above, CR values of 0.7 or higher and an AVE of at least 0.5 (Fornell & Larcker 1981).

Discriminant validity is established when the square root of AVE for a construct exceeds its correlation with all other constructs, as per the criteria established by Ab Hamid, Sami and Sidek (2017) and Fornell and Larcker (1981). The square root of AVE (in **bold** and *italics*) for one construct (EE) was found to be greater than its correlation with another construct in this investigation (Table 3), consequently providing substantial support for discriminant validity.

The SEM model fit's acceptability was evaluated using SmartPLS statistics, which included the standardised root mean residual (SRMR) and the normed fit index (NFI), as well as the global fit index from this study. Using the formula provided by Henseler, Ringle and Sarstedt (2015), the global goodness-of-fit (GoF) statistic for the research model was computed:

$$GoF = \sqrt{AVE * R^2} \quad \text{[Eqn 1]}$$

The global GoF was determined to be 0.381, which surpasses the Khojasteh and Lo (2015) threshold of GoF > 0.36. This investigation concludes that the research model's latent variable relationship is robust, suggesting a satisfactory overall fit.

The variation between the observed correlation and the model's implied correlation matrix is the SRMR. In

TABLE 1: Demographic characteristics.

Variable	Category	*n*	%
Campus	Klerksdorp	88	58.30
	Potchefstroom	42	27.80
	Taung	21	13.90
Age (years)	< 20	31	20.50
	21–30	106	70.20
	31–40	11	7.30
	41–50	3	2.00
Gender	Male	48	31.80
	Female	103	68.20
Race	Black people	136	90.10
	Mixed race people	13	8.60
	Indian people	1	0.70
	White people	1	0.70
Level of study	N5	102	67.50
	N6	49	32.50
Course	Business management	119	78.80
	Marketing management	32	21.20

TABLE 2: Reliability and validity of the measurement scale.

Research construct		Scale item		Cronbach's alpha	CR	AVE	Factor loadings
		Mean	SD				
EE	EE1	3.748	0.937	0.890	0.912	0.566	0.733
	EE2	3.662	0.989	-	-	-	0.734
	EE3	4.007	1.058	-	-	-	0.760
	EE4	3.881	0.955	-	-	-	0.806
	EE5	3.980	1.095	-	-	-	0.784
	EE6	3.914	0.983	-	-	-	0.812
	EE7	3.854	0.938	-	-	-	0.708
	EE8	3.762	1.008	-	-	-	0.669
OE	OE1	2.894	1.111	0.885	0.919	0.739	0.883
	OE2	2.834	1.124	-	-	-	0.907
	OE3	2.623	1.041	-	-	-	0.866
	OE4	2.556	1.177	-	-	-	0.777
OR	OR1	3.503	1.048	0.813	0.869	0.571	0.733
	OR2	3.464	0.995	-	-	-	0.742
	OR3	3.523	0.982	-	-	-	0.787
	OR4	3.702	0.912	-	-	-	0.738
	OR5	3.424	1.070	-	-	-	0.778

EE, Entrepreneurship education; OE, opportunity exploitation; OR, opportunity recognition; SD, standard deviation; CR, composite reliability; AVE, average variance extracted.

TABLE 3: Discriminant validity: Fornell and Larcker criterion.

Construct	EE	OE	OR
EE	***0.752***	-	-
OE	0.277	***0.860***	-
OR	0.674	0.362	***0.756***

Note: The square root of AVE is placed in bold and italics.
EE, entrepreneurship education; OE, opportunity exploitation; OR, opportunity recognition.

SmartPLS 4, standard bootstrapping was used. The average difference between observed and predicted correlation is a comprehensive model fit criterion. The NFI is 1 minus the null model Chi-squared. A closer NFI value near 1 indicates better alignment. Hair and Alamer (2022) recommend SRMR and NFI indices of more than 0.90 or less than 0.08. In this study, SRMR and NFI were 0.078 and 0.760, respectively (Table 4). The conceptual model for this study would have fit better with an NFI of 0.90, because the SRMR and global fit were good.

Q-squared (Q^2) was implemented in this investigation to evaluate the predictive relevance of a model. When Q^2 exceeds 0, a model is considered predictively relevant. Therefore, $Q^2 > 0$ is thought to be favourable. In addition, the predictive relevance of endogenous constructs is established by Q^2. The presence of Q^2 values above zero suggests that the model has predictive relevance and that the values have been accurately reconstructed. The Q^2 for the latent and endogenous variables, OE and OR, in this study is 0.061 and 0.438, respectively, as indicated by the results in Table 5. This study model has significant predictive power and relevance, as these values are substantially above zero.

Structural model assessment and path modelling

As the evaluation of the measurement model met the entire criterion, the structural model was then evaluated. In order to achieve this, a path analysis was implemented. Path coefficients were computed for each hypothesis that was proposed, and bootstrapping was employed to generate t-statistics and p-values for the purpose of evaluating the significance level. The theoretical foundations of the study and the significance of the relationship between model constructs were demonstrated and evaluated by this SEM procedure. The p-values and regression coefficients of the study were analysed to assess the structural model. The structural model's outcome for the proposed hypothesis is illustrated in Figure 2.

Hypothesis testing

Path analysis examined the causal relationship between latent variables after evaluating and finalising the measurement and structural models (Hancock, Stapleton & Mueller 2018). Clark and Watson (2019) contend that SEM asserts that specific latent variables have a direct or indirect impact on other variables in the model, as per Nusair and Hua (2010). This results in estimation results that demonstrate the relationship between these latent variables. The estimation results from hypothesis testing for this investigation are presented in Table 6. The table shows the path coefficients, t-statistics and proposed hypothesis, as well as whether the hypothesis is supported or rejected. According to the literature, a significant relationship is indicated by a t-value of greater than 1.96, and a robust relationship between latent variables is indicated by path coefficients greater than one (Zhang 2022).

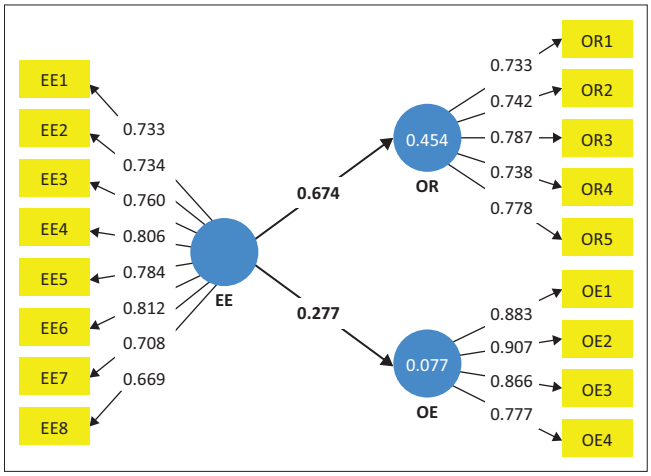
Two hypotheses were formulated to resolve the research questions in accordance with the findings in Table 6. All hypotheses (H1 and H2) were statistically supported and found to be significant ($p = 0.05$, $t > 196$) based on the positive or negative effect of the relationship.

Summary of hypotheses' results

This section presents a discussion of the results extracted from hypothesis testing.

H1: Entrepreneurship education and opportunity recognition

The selected TVET college was evaluated in terms of the relationship between entrepreneurship education and opportunity recognition. The findings suggest that entrepreneurship education has a beneficial impact on the recognition of opportunities. Furthermore, the findings indicate that the correlation between opportunity recognition and entrepreneurship education is robust and significant ($\beta = 0.674$, $t = 12.545$, $p = 0.000$). The hypothesis was



EE, entrepreneurship education; OE, opportunity exploitation; OR, opportunity recognition.

FIGURE 2: Structural model.

TABLE 4: Model fit indices.

Fit indices	Saturated model	Estimated model
SRMR	0.078	0.087
NFI	0.760	0.755

SRMR, standardised root mean residual; NFI, normed fit index.

TABLE 5: Predictive relevance assessment.

Predictor variables	Outcome variables	R-squared (R^2)	F-squared (F^2)	Q-squared (Q^2)
EE	OE	0.077	0.083	0.061
EE	OR	0.454	0.813	0.438

EE, entrepreneurship education; OE, opportunity exploitation; OR, opportunity recognition.

TABLE 6: Hypothesis testing results.

Hypothesised relationship	Hypothesis	Path coefficient (β)	T-statistics (t)	P	Rejected or supported
EE → OE	H1	0.277	3.938	0.000	Significant and supported
EE → OR	H2	0.674	12.545	0.000	Significant and supported

EE, entrepreneurship education; OE, opportunity exploitation; OR, opportunity recognition.

corroborated by the results, which indicated a positive correlation. This suggests that the recognition of opportunities is significantly influenced by entrepreneurship education. Supporting the hypothesis, research conducted by Otache et al. (2024) also demonstrated that entrepreneurship education has a positive and significant impact on opportunity recognition. Their findings corroborate the results of the earlier correlation analysis:

H2: Entrepreneurship education and opportunity exploitation

Opportunity exploitation was evaluated concerning entrepreneurship education. The findings suggested that entrepreneurship education has a positive and significant impact on opportunity exploitation (β = 0.277; t = 3.938; p = 0.000). This suggests that there is a moderate correlation between entrepreneurship education and opportunity exploitation in the selected TVET college. This indicates that the hypothesis is significant and well-supported. In support of this finding, research by Othmanet et al. (2020a) demonstrated that entrepreneurship education positively influenced students' actions in exploiting business opportunities. This highlights the fact that providing individuals with diverse experiences and knowledge can enhance their capacity to capitalise on entrepreneurial opportunities.

Discussion

The aim of this study was oriented towards the two proposed hypotheses, that is entrepreneurship education's effect on opportunity recognition and exploitation in the setting of a selected TVET college in the North West province of South Africa. The findings highlight the significance of entrepreneurship education offered at the TVET college. This emphasises the influence of entrepreneurship curricula on students' desires to start businesses. It should be mandatory at TVET colleges that students should complete their studies and exit the institution with a feasible business plan in hand. The importance of entrepreneurship education enables the students to be self-employed, and, in turn, creates employment for other individuals. In addition, this type of education places students in the favourable position of being employed. Entrepreneurship education capacitates students to be able to generate business ideas, recognise and exploit opportunities, gather relevant resources, compile business plans, marketing plans and financial plans, and to be able to apply for funding from different agencies. Resulting from the teaching and learning delivery and the level of the curriculum content, students are capable of recognising and exploiting business opportunities.

The capacity to recognise and exploit business opportunities is crucial and foundational to the entrepreneurial process (Kuratko & Morris 2018). Without opportunities, entrepreneurship would not exist, as they serve as the starting points for any venture. Therefore, exposure to entrepreneurship education is essential for enhancing the quality of human capital and fostering business creation. Entrepreneurship education can help individuals strengthen their skills and adapt more efficiently to changing environments (Othman et al. 2020a). This study makes a valuable contribution to the literature on entrepreneurship education, opportunity recognition and exploitation by examining the direct connections between these constructs. The findings indicate that entrepreneurship education influences both opportunity recognition and exploitation.

Entrepreneurship education is now broadly recognised as a critical priority for development, helping to manage uncertainty and tackle numerous social, technological and economic challenges, such as those related to health, job creation, education and training systems, living standards and economic development (Ndou 2021). This kind of education plays a pivotal role in nurturing the mindset and skills of students to be able to recognise opportunities that will contribute to solving community challenges and add value to the economic growth of the region or country. Entrepreneurship education is thought to equip students for an entrepreneurial career after completing their studies. In addition, empirical research indicates that students who receive entrepreneurship education are significantly more inclined to identify and seize opportunities compared to those who do not, reinforcing the effectiveness of such education in fostering opportunity recognition and exploitation (Otache et al. 2024).

Limitations of the study

Most of the studies on entrepreneurship education have been conducted within the context of universities, with an emphasis on entrepreneurial intentions, entrepreneurial self-efficacy, entrepreneurial behaviour and other entrepreneurial outcomes. The significance of this study is examining the influence of entrepreneurship education on opportunity recognition and exploitation in the setting of a TVET college. A few studies on entrepreneurship education have been conducted within the TVET college environment.

The first limitation of this study is that it was conducted with a small sample size (n = 151) of students from a single TVET college. The second limitation is that the study focussed solely on students enrolled in business management and marketing management programmes, excluding those from other academic backgrounds. The last limitation is the reliance on quantitative methods for data collection, whereas the use of qualitative or mixed methods could provide an in-depth analysis of entrepreneurship education offered in the college.

Implications

This study presents several implications for both theory and practice. It has been demonstrated that entrepreneurship education improves the ability to recognise and exploit opportunities. Based on the findings, it is recommended that entrepreneurship education be made a compulsory subject across all programmes in the TVET college sector.

This approach would ensure equal access for all students to gain the skills and exposure offered by entrepreneurship education. This provides a chance for future research to increase the sample size and involve a broader range of TVET colleges. Upcoming studies should also incorporate students from disciplines outside of business and management. In addition, future research could explore the impact of entrepreneurship education on various entrepreneurial outcomes within TVET colleges. Alternative research methods could be employed to gain a deeper understanding of entrepreneurship education. A comparative analysis between students from business and non-business backgrounds could be conducted as well. Furthermore, future studies might consider examining the moderating effects of age and gender.

Conclusion

The main aim of this study was to assess the effect of entrepreneurship education on opportunity recognition and exploitation. To achieve this, the relationships between the various aspects of entrepreneurship education, opportunity recognition and exploitation were analysed statistically. The findings offer statistical evidence of the influence of entrepreneurship education on opportunity recognition and exploitation in the setting of a TVET college in South Africa. An entrepreneur's ability to recognise opportunities relies on essential knowledge and skills acquired through entrepreneurship education. The more an entrepreneur is trained, the greater their capacity to recognise opportunities for creating enterprises. Once an opportunity is recognised, the entrepreneur enters the phase of exploiting it. During this exploitation phase, entrepreneurs leverage their networks to find the right individuals to establish the core team, often referred to as the founding team. This study emphasises the significance of entrepreneurship education offered to students in TVET colleges.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

R.K.L. was involved in the conceptualisation of the article, draft work, data analysis and presentation of the results. A.S. and B.N.M. were involved in the introduction and background of the study, the literature review, discussion and conclusion.

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Data availability

The data that support the findings of this study are available from the corresponding author, R.K.L. upon reasonable request.

Disclaimer

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