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Determinants of entrepreneurial intentions among postgraduate students: evidence from a University in the Eastern Cape

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Introduction: Entrepreneurship plays an important role in driving innovation, job creation, and economic sustainability, particularly in an under-resourced environment such as South Africa's Eastern Cape.

Methods: This study investigates the factors influencing the development of entrepreneurial mindset, identity, and self-efficacy among postgraduate students, drawing on the integrated theoretical perspectives of the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Human Capital Theory (HCT). Adopting a qualitative case study approach, data were collected through 24 semi-structured interviews with postgraduate students, lecturers, and university managers at a public university in the region.

Results: The findings reveal that entrepreneurship education promotes a shift in perception from a transactional, business-oriented view of entrepreneurship to a mindset characterized by innovation and strategic problem-solving. Experiential learning and mentorship were identified as enablers of self-efficacy and entrepreneurial identity, aligning with SCT's emphasis on social modeling and mastery experiences.

Discussion: However, structural barriers such as limited access to practical training, inadequate funding, and unsupportive institutional policies were found to weaken students' perceived behavioral control, as framed by TPB. While participants acknowledged the value of skill acquisition for personal and economic advancement, the return on human capital was constrained by resource gaps. The study stresses the need for contextually grounded entrepreneurship education, integrated mentorship frameworks, and institutional reform to create an enabling environment that supports student entrepreneurship in disadvantaged communities.

KEYWORDS

entrepreneurship, postgraduate students, entrepreneurial mindset, higher education, entrepreneurship education, student experiences

1 Introduction

Developing an entrepreneurial mindset is increasingly recognized as a vital component in preparing postgraduate students for success across both self-employment and corporate careers (Balogun, 2025). In response, universities globally are embedding entrepreneurship education into their curricula to cultivate critical competencies such as problem-solving and strategic thinking (Guo et al., 2024). Central to this development is entrepreneurial self-efficacy, an

individual's confidence in their ability to perform entrepreneurial tasks, which plays a key role in promoting proactive, opportunity-oriented behavior and innovative thinking (Ferreira-Neto et al., 2023). This study investigates the interrelationship between entrepreneurial mindset, identity formation, and self-efficacy among postgraduate students, aiming to generate insights into how higher education institutions can enhance entrepreneurship education to prepare students for both formal and informal entrepreneurial engagement. However, despite its acknowledged benefits, the cultivation of an entrepreneurial mindset remains challenging. Students often face barriers, including limited access to funding, mentorship, and institutional infrastructure, as well as socio-cultural norms that discourage risk-taking and entrepreneurial experimentation (Gankandage and Jayathilaka, 2025).

Entrepreneurship is more than the mere act of starting a business; it includes the cultivation of an innovative, opportunity-oriented mindset among students. Studies indicate that individuals with an entrepreneurial mindset are more inclined to take calculated risks, demonstrate and contribute to economic development through job creation and value generation (Ndofirepi, 2020). Entrepreneurship education has been shown to enhance essential soft skills such as self-confidence, communication, and leadership, which enhances entrepreneurial self-efficacy and supports a cognitive shift to resolve challenges and failures as opportunities for personal and professional growth (Guo et al., 2024; Asaleye et al., 2023). To clarify terminology, this study defines entrepreneurial mindset as a cognitive and behavioral orientation marked by innovation, adaptability, opportunity recognition, and proactive problem-solving (Iddris, 2025). Entrepreneurial identity refers to the degree to which individuals perceive and define themselves as entrepreneurs, influenced by personal experience, education, and social factor (Mei and Symaco, 2022). These constructs are closely associated with the development of entrepreneurial self-efficacy, or belief in one's capacity to perform entrepreneurial tasks (Wardana et al., 2024).

In South Africa, where persistent unemployment, particularly in regions such as the Eastern Cape, continues to impede socio-economic progress, entrepreneurship is increasingly promoted as a viable solution to economic stagnation (Mgolodela, 2021). The Eastern Cape province is one of the most socio-economically challenged regions in South Africa. As of 2024, it has a youth unemployment rate of 61.2 per cent, the highest in the country (Stats SA, 2024). The province also faces widespread underdevelopment, limited industrial investment, and high educational attrition rates, creating significant barriers to economic participation for young graduates (Department of Higher Education and Training, 2023). In this environment, entrepreneurship is increasingly promoted through higher education as a viable pathway toward self-employment and economic inclusion. Despite the growing emphasis on entrepreneurship education in South African universities, limited qualitative research has been conducted to how such programs influence postgraduate students' internal dispositions and behavioral readiness, particularly in non-business disciplines and under-resourced institutional environment.

Higher education institutions thus have a role to play in nurturing entrepreneurial potential by equipping students with relevant skills, mindsets, and experiential learning opportunities (Oloni et al., 2017). However, a key limitation lies in the nature of entrepreneurship curricula, which frequently overlook the specific socio-economic realities of locality; this disconnect can result in a gap between theoretical instruction and practical application, reducing the effectiveness of entrepreneurship education in addressing regional

development needs (Ajani, 2024). This study is significant on two key fronts: (i) its practical contribution to addressing socio-economic and institutional challenges in postgraduate entrepreneurship, and (ii) its theoretical advancement through the application and extension of TPB, SCT, and HCT frameworks; these are explained below.

The practical significance of this study lies in its potential to inform evidence-based policies and institutional strategies aimed at addressing the socio-economic and structural barriers that constrain postgraduate entrepreneurial activity, particularly within the historically marginalized and economically underdeveloped Eastern Cape region of South Africa. Students in this area face a confluence of challenges, including limited access to financial resources, underdeveloped mentorship networks, and the non-inclusion of entrepreneurship education within non-business academic disciplines. These obstacles hinder the development of entrepreneurial competencies and restrict students' perceived feasibility and desirability of pursuing entrepreneurship. The current study tends to offer insights for higher education institutions, government agencies, and development stakeholders seeking to cultivate a more enabling entrepreneurial. In doing so, the study contributes to the development of policies such as expanded experiential learning opportunities, cross-disciplinary entrepreneurship integration, and improved support infrastructure, which can empower students to transform entrepreneurial aspirations into viable ventures, thereby promoting inclusive economic growth and long-term regional economic sustainability.

This current study contributes to theoretical advancement by extending and contextualizing three foundational frameworks: the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Human Capital Theory (HCT). While TPB has been widely utilized to explain entrepreneurial intentions through individual attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991), it insufficiently captures the broader socio-cognitive and structural forces influencing intention in under-resourced regions. To address this limitation, we integrate SCT (Bandura, 2001), which foregrounds self-efficacy and learning through social modeling, and HCT (Becker, 1964), which emphasizes the role of education and skills acquisition as forms of entrepreneurial capital. Situated within the unique socio-economic and educational landscape of the Eastern Cape, characterized by high youth unemployment, resource constraints, and institutional inequalities, this study proposes a hybrid model where SCT enhances the motivational and cognitive processes underlying TPB, and HCT provides the structural foundation that enables or inhibits entrepreneurial intention formation.

Despite a growing body of literature on entrepreneurship education and entrepreneurial intention, empirical studies have predominantly focused on undergraduate populations, urban universities, or developed countries, often treating students as a homogeneous group (Bahaw et al., 2025; Alshibani et al., 2025; Aure, 2025). Few studies have examined postgraduate students in under-resourced environments, who face unique socio-economic constraints, identity transitions, and cognitive developments influencing their entrepreneurial trajectories (Killingberg, 2024; Watts and Hetherington, 2024). Moreover, while individual theories such as the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Human Capital Theory (HCT) have been applied in isolation, integrated theoretical approaches remain rare in empirical investigations. This fragmentation may limit understanding of how mindset, identity, and self-efficacy co-evolve in response to entrepreneurship education within an environment with high

unemployment, institutional barriers, and resource scarcity, such as South Africa's Eastern Cape.

From the foregoing, the main objective of this study is to examine how entrepreneurship education influences the development of entrepreneurial intentions, mindset, identity, and self-efficacy among postgraduate students at a South African university situated in a region characterized by high unemployment and institutional constraints. The specific objectives are to:

- i Examine how postgraduate students' perceptions of entrepreneurship evolve through engagement with entrepreneurship education.
- ii Explore the role of experiential learning and mentorship in influencing students' entrepreneurial identity and self-efficacy.
- iii Assess how institutional support and barriers affect students' perceived behavioral control and their capacity to pursue entrepreneurial ventures.
- iv Investigate the extent to which skills acquired through entrepreneurship education are perceived as transferable and economically empowering.
- v Identify resource-based constraints that hinder the translation of entrepreneurial skills and intentions into actual venture creation.

2 Theoretical framework

Entrepreneurship education for postgraduate students is underpinned by multiple theoretical perspectives that explain the development of entrepreneurial identity and self-efficacy; this study employs an integrated theoretical framework drawing on the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Human Capital Theory (HCT) to analyze the formation of entrepreneurial mindset, identity, and self-efficacy among postgraduate students. While these frameworks offer distinct insights ranging from behavioral intention and psychological development to economic returns on education, they also exhibit conceptual overlaps, particularly between TPB's notion of perceived behavioral control and SCT's concept of self-efficacy. The following section explains each theory, including its relevance, limitations, and how it contributes to the analysis used in this study.

2.1 Theory of planned behavior (TPB)

Ajzen's (1991) Theory of Planned Behavior (TPB) is one of the most widely applied models for understanding entrepreneurial intentions. TPB posits that an individual's intention to engage in a specific behavior is influenced by three interrelated components: attitude toward the behavior, subjective norms, and perceived behavioral control. The attitude toward entrepreneurship refers to an individual's positive or negative evaluation of entrepreneurial activity. Entrepreneurship education has been shown to enhance these attitudes by exposing students to success stories, practical skills, and opportunities for innovation (Ncanywa et al., 2022). Positive attitudes are further cultivated through experiential learning mechanisms, such as startup incubators, business simulations, and case-based learning, that help students perceive entrepreneurship as both achievable and personally rewarding (Man et al., 2024).

Subjective norms represent the perceived social expectations or pressures to engage in or refrain from entrepreneurial behavior. For postgraduate students, these norms may arise from peers, family, mentors, or institutional culture. Evidence suggests that when universities actively foster an entrepreneurial ecosystem through events, mentorship, and peer role models, students are more likely to perceive entrepreneurship as a socially legitimate and desirable career path (Valencia-Arias et al., 2022). Perceived behavioral control reflects an individual's belief in their capacity to perform entrepreneurial tasks effectively (Markowska, 2018). Entrepreneurship education plays a role in strengthening this perception by equipping students with concrete skills in business planning, financial literacy, opportunity evaluation, and risk management (Ncanywa and Dyantyi, 2022). Importantly, high levels of perceived behavioral control are closely linked to entrepreneurial self-efficacy, which is a central focus of this study. The application of TPB within this study demonstrates that the entrepreneurial mindset developed through education significantly influences postgraduate students' emerging entrepreneurial identity and self-efficacy; this occurs by influencing their attitudes, aligning social expectations with entrepreneurial goals, and strengthening their confidence in their capabilities. However, TPB also acknowledges barriers such as societal skepticism toward entrepreneurship or limited access to startup resources that can weaken perceived behavioral control and, in turn, hinder the formation of entrepreneurial intentions.

2.2 Social cognitive theory (SCT)

Bandura's (2001) Social Cognitive Theory (SCT) emphasizes the relationship between personal factors, environmental influences, and behavior. It is particularly relevant for understanding the development of entrepreneurial self-efficacy among postgraduate students through mechanisms such as observational learning, mentorship, and experiential engagement. Observational learning, a core element of SCT, shows the influence of role models in influencing entrepreneurial behavior. Postgraduate students often draw inspiration from successful entrepreneurs, faculty, or peers who demonstrate resilience, creativity, and innovation in practice. Entrepreneurship education that incorporates guest lectures, case studies, or exposure to entrepreneurial success stories provides vicarious experiences through which students internalize entrepreneurial competencies and norms (Zhao et al., 2022).

Central to SCT is the concept of self-efficacy, an individual's belief in their capability to achieve specific goals. In an entrepreneurial context, self-efficacy is strengthened when students actively participate in hands-on learning experiences such as designing business plans, engaging in startup simulations, or pitching ideas. These experiences promote confidence by providing mastery opportunities and strengthening the belief that entrepreneurial success is attainable (Ratten and Jones, 2021). Mentorship further enhances self-efficacy by offering personalized guidance, encouragement, and validation of potential. Interactions with mentors, particularly those with real-world entrepreneurial experience, help students navigate uncertainty and perceive challenges as surmountable rather than deterrents. SCT also introduces the concept of reciprocal determinism, which refers to the bidirectional interaction between cognitive beliefs, behavior, and environmental conditions. For instance, when universities provide

access to resources such as startup funding, incubator programs, or supportive faculty, they cultivate environments that enable students to translate self-belief into entrepreneurial action. Conversely, the absence of institutional support can erode self-efficacy and inhibit entrepreneurial engagement, despite internal motivation.

Social Cognitive Theory thus aligns closely with this study's focus on entrepreneurial identity formation and self-efficacy. It provides a framework for examining how external influences, such as experiential learning and mentorship, shape internal beliefs and behavioral performance. Moreover, it demonstrates how supportive ecosystems can mediate the negative effects of resource constraints, thereby enabling entrepreneurial development even in a high-unemployment environment.

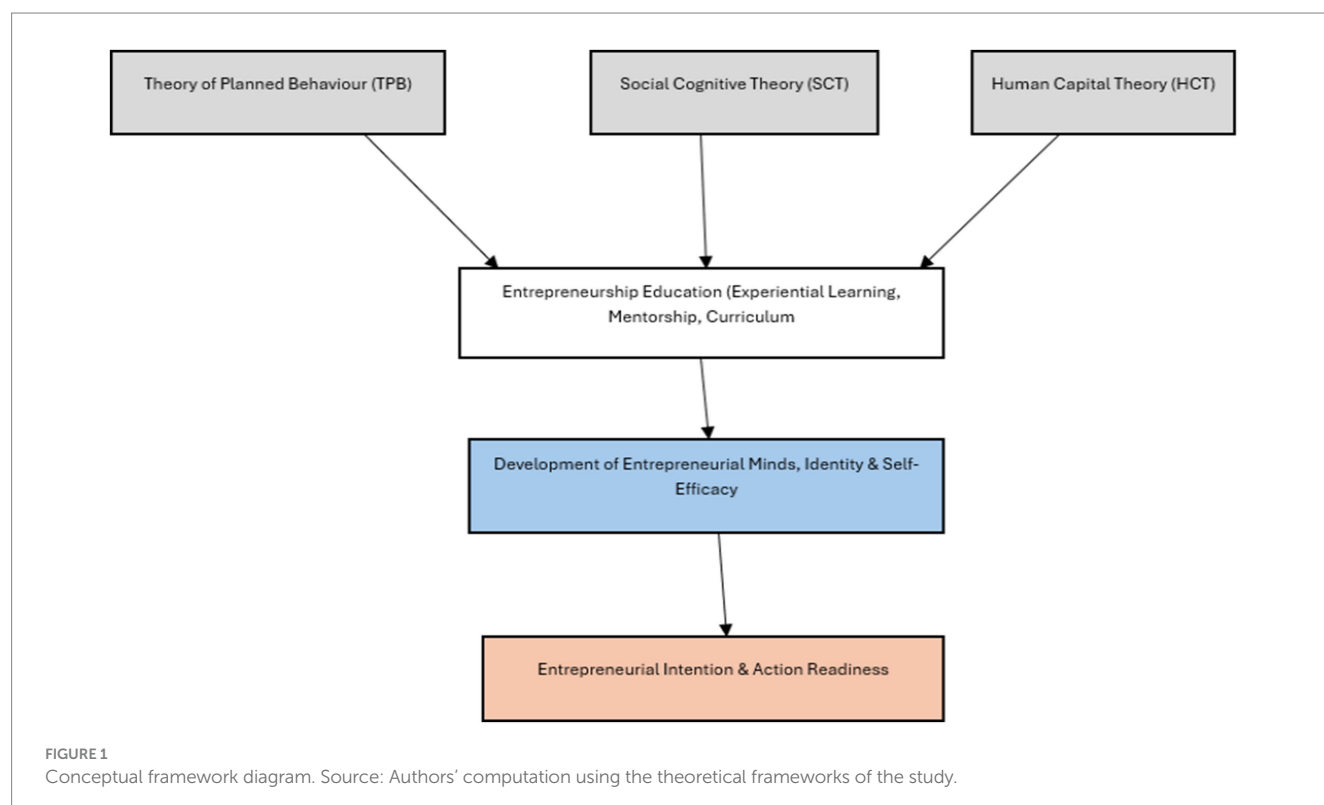
2.3 Human capital theory (HCT)

Becker's (1964) Human Capital Theory (HCT) posits that investments in education and skills development enhance individual productivity and contribute to economic growth (Asaleye et al., 2021). With respect to entrepreneurship education, HCT emphasizes how the acquisition of market-relevant knowledge and competencies equips postgraduate students with the capabilities necessary for entrepreneurial success. Entrepreneurship education functions as a key mechanism for human capital formation by imparting skills such as financial literacy, strategic thinking, opportunity recognition, and business planning (Ghafar, 2020). These competencies prepare students for venture creation and improve their employability across a range of sectors, thus positioning entrepreneurship education as both a career-enabling and economy-strengthening initiative. Importantly, HCT extends beyond individual goals to the societal and

economic value of educational investments. In high-unemployment regions like South Africa's Eastern Cape, where structural barriers impede access to traditional employment, entrepreneurship education serves as a strategic response to systemic joblessness. Therefore, by developing entrepreneurial competencies among postgraduate students, universities can stimulate local enterprise development, support self-employment, and contribute to improved regional economic development.

A core principle of HCT is the importance of practical training in translating theoretical knowledge into applied capability. Entrepreneurship programs that incorporate internships, startup competitions, or business simulations enable students to apply their learning in an authentic environment, thereby enhancing their confidence and preparedness for entrepreneurial action. Such experiential components help maximize the return on educational investment by promoting both competence and self-efficacy. Human Capital Theory thus complements this study's emphasis on entrepreneurship education as a catalyst for identity development and economic empowerment. It provides a macro-level perspective through which to understand how educational institutions can address persistent challenges such as poverty, unemployment, and inequality through deliberate investment in skills-based curricula and innovation-driven learning environments.

Figure 1 illustrates the conceptual framework guiding this study, which integrates the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Human Capital Theory (HCT) to examine how entrepreneurship education influences entrepreneurial development among postgraduate students. These three theories are brought together to accounts for psychological, behavioral, and structural factors in the formation of entrepreneurial intention, mindset, and self-efficacy. TPB informs the motivational component



of the framework by focusing on the role of attitude, subjective norms, and perceived behavioral control in influencing entrepreneurial intentions. In the Eastern Cape, perceived behavioral control is particularly salient, as students often face significant external constraints such as limited access to funding, regulatory restrictions on student ventures, and weak institutional support which may inhibit entrepreneurial action even when attitudes and social norms are favorable.

SCT provides the psychological underpinning of the framework, highlighting how self-efficacy develops through mastery experiences, social modeling, and verbal encouragement. Within the university environment, students gain self-belief by engaging in experiential learning activities such as simulations, pitching sessions, and mentorship. These elements contribute to how students begin to see themselves as capable entrepreneurs, reinforcing identity formation and behavioral readiness. HCT adds an economic and structural perspective, positioning entrepreneurship education as a form of human capital investment. It emphasizes how skill acquisition—such as financial literacy, negotiation, and opportunity recognition—enhances individual productivity and employability. However, in under-resourced regions like the Eastern Cape, where youth unemployment exceeds 61% (Stats SA, 2024), the actual return on educational investment is often constrained by systemic challenges, such as a lack of incubation spaces, inadequate institutional funding, and limited access to entrepreneurial networks.

3 Empirical literature

The entrepreneurial mindset is increasingly recognized as a transformative driver in improving postgraduate students' identity and self-efficacy. It includes a set of attitudes, behaviors, and competencies that empower individuals to identify and act on opportunities, overcome uncertainty, and persist in the face of setbacks (Li et al., 2023). Far beyond business creation, this mindset helps in adaptive thinking and proactive problem-solving qualities essential for success in both entrepreneurial and non-entrepreneurial careers. The entrepreneurial mindset serves as a key outcome of entrepreneurship education, influencing students' intentions to start ventures, self-concept and confidence in their capabilities.

3.1 Review of entrepreneurial mindset and identity formation

The entrepreneurial mindset contributes to identity formation by encouraging students to align their personal values, goals, and aspirations with entrepreneurial pursuits. Through entrepreneurship education, students are exposed to a wide range of business concepts, industries, and innovation-driven opportunities, enabling them to discover domains that align with their interests and passions (Abbas and Uddin, 2025; Ncanywa et al., 2022); this process of exploration and self-discovery cultivates a sense of purpose and facilitates the development of an entrepreneurial identity, one marked by creativity, resilience, and adaptability. Identity formation is closely tied to experiential learning opportunities embedded within entrepreneurship programs. Fieldwork, mentorship, and direct interaction with successful entrepreneurs provide students with opportunities to internalize entrepreneurial traits and behaviors (Vodă and Florea, 2019). Such

experiences allow students to shift from passive recipients of knowledge to active participants in entrepreneurial ecosystems, strengthening their sense of belonging and belief in their entrepreneurial potential.

Social Cognitive Theory (Bandura, 1985) supports this perspective by emphasizing the reciprocal interaction between cognitive factors, such as mindset, and environmental influences in influencing identity. Students who actively engage with entrepreneurship-supportive environments, including startup incubators, peer networks, and mentorship communities, are more likely to adopt an entrepreneurial identity that aligns with their long-term aspirations (Qamariah et al., 2024). In this way, the entrepreneurial mindset supports intention formation and facilitates a deeper transformation of students' self-concept and professional identity.

3.2 Review of entrepreneurial mindset and self-efficacy

Self-efficacy refers to an individual's belief in their capacity to execute tasks successfully and overcome challenges. Regarding entrepreneurship education, self-efficacy is enhanced when students are equipped with practical tools, relevant knowledge, and skills essential for an entrepreneurial process (Ratten and Jones, 2021). Studies consistently show that participation in entrepreneurship programs leads to increased student confidence in identifying opportunities, solving problems, and managing risk (Sun, 2023). Entrepreneurial self-efficacy plays a mediating role between entrepreneurship education and entrepreneurial intention by promoting proactive attitudes and a willingness to engage with uncertainty (Hu and Li, 2025). Students who perceive themselves as competent are more likely to take initiative in academic, personal, or venture-based activities; this sense of capability is often developed through experiential learning such as business simulations, startup projects, and real-world problem-solving tasks, integrated into entrepreneurship curricula (Handayani et al., 2020).

Mentorship also plays a role in strengthening self-efficacy, offering guidance, encouragement, and modeling entrepreneurial behavior. Mentors help students develop confidence in their own decision-making processes (Wilson et al., 2024). The presence of role models who exemplify successful entrepreneurial navigation strengthens students' belief that they, too, can manage ambiguity, recover from failure, and pursue opportunity. Postgraduate students frequently apply entrepreneurial thinking across both academic and personal environments. In academia, the problem-solving skills and innovation capabilities gained through entrepreneurship education to address research challenges, develop interdisciplinary projects, and contribute creatively to their fields. In personal, the same mindset promotes adaptive thinking, enabling students to approach daily problems with creativity and persistence. Studies illustrate that students who embrace entrepreneurial self-efficacy are better prepared to initiate ventures and demonstrate a greater capacity to adapt, persist, and seize opportunities in a rapidly changing environment (Benchirifa et al., 2017).

3.3 Gap identified and contribution to empirical literature

Despite the growing body of literature on entrepreneurial intentions, much of the existing empirical research has centered on

undergraduate populations in urban or developed regions, with emphasis on cognitive models like the Theory of Planned Behavior (TPB) applied in isolation (Yousaf et al., 2021). Studies on postgraduate students, who possess more advanced cognitive and professional experiences, remain limited, especially within under-resourced, high-unemployment regions such as South Africa's Eastern Cape; this omission is given the increasing importance of postgraduate education in developing knowledge-intensive entrepreneurship in emerging economies (Ndofirepi et al., 2018). Another empirical gap identified in this study lies in the fragmented theoretical approaches used to understand entrepreneurial intention and behavior. While TPB remains the dominant approach (Ajzen, 1991), there is growing recognition of the value in integrating complementary theories such as Social Cognitive Theory (SCT) and Human Capital Theory (HCT) to gain a more comprehensive understanding of how self-efficacy, identity, and mindset interact within the educational environment (Baluku et al., 2019; Elnadi and Gheith, 2021). Yet few studies have applied these frameworks in combination, and even fewer have done so using qualitative methods that capture the lived experiences and identity transformations of students (Khezzabadi and Hassani, 2023).

Furthermore, much of the African-based literature tends to generalize findings without accounting for the distinctiveness of regional institutional factors, especially in areas facing constraints such as infrastructural deficits, limited entrepreneurial and restricted access to mentorship and capital (Puni et al., 2018). There is a need to examine how these structural factors influence perceived behavioral control and entrepreneurial self-efficacy, particularly for postgraduate students seeking to transition from education to self-employment or innovation-driven careers (Ndofirepi, 2022). Therefore, this study addresses these gaps by: (i) focusing on postgraduate students in an under-researched, resource-constrained region of South Africa. (ii) Employing a multi-theory framework that integrates TPB, SCT, and HCT to better capture the relationship of mindset, self-efficacy, and identity. (ii) Utilizing qualitative data from students, lecturers, and university managers to uncover the pathways through which entrepreneurship education influences entrepreneurial development. (iv) Indicate institutional barriers such as lack of practical support, unfriendly university policies, and resource gaps as yet often overlooked determinants influencing entrepreneurial performance (Shahab et al., 2019; Liu et al., 2019). In doing so, the study contributes empirical insights into the identity-based formation of entrepreneurial intentions, situating entrepreneurial development as an individual psychological process and socially embedded education-induced transformation influenced by structural and institutional conditions.

4 Research methods

This study adopts a qualitative research design to investigate the perceptions and lived experiences of postgraduate students in relation to entrepreneurship education, with the aim of aligning the methodology with the study's objectives.

4.1 Research design

This study adopts a qualitative case study design, which is particularly suited to investigate social phenomena (Swedberg, 2020).

A case study approach was selected to facilitate the understanding of how entrepreneurship education influences entrepreneurial mindset, identity formation, and self-efficacy among postgraduate students at a single public university in South Africa's Eastern Cape. This region is characterized by underdevelopment, high youth unemployment, and limited entrepreneurial infrastructure conditions that heighten the need for insights into entrepreneurship education. The case study design enabled to examine individual experiences and institutional practices within this distinct; this approach aligns with the study's exploratory objectives, aiming to generate rich, grounded insights into the relationship between educational interventions and the formation of entrepreneurial intentions in disadvantaged environment.

4.2 Population and sampling

The population comprised postgraduate students enrolled at the selected university, along with key academic and administrative stakeholders involved in entrepreneurship education. Purposive sampling was used to select participants based on their direct engagement with entrepreneurship education, either as part of the formal curriculum or through co-curricular activities supported by the institution. Inclusion criteria for student participants were as follows:

- i Enrollment in a postgraduate academic program (Honours, Master's, or PhD).
- ii Demonstrated exposure to entrepreneurship education, defined as participation in one or more of the following: Entrepreneurship coursework or modules; University-sponsored workshops or training sessions; Participation in innovation hubs, pitch competitions, or start-up incubators; Engagement with mentorship or business advisory programs.
- iii Students with no formal or informal exposure to entrepreneurship-related activities were excluded to ensure relevance to the study's focus.

A total of 24 participants were interviewed: Ten postgraduate students representing diverse disciplines and varying levels of entrepreneurial engagement; Seven lecturers involved in the design and delivery of entrepreneurship-related content; Seven university managers or administrators, responsible for policy, funding, and strategic support of entrepreneurship education. This triangulated sample enabled the study to capture multiple perspectives, student-level experiences, instructional strategies, and institutional frameworks, thereby enhancing credibility and contextual depth. Purposive sampling was appropriate given the study's emphasis on information-rich cases and the aim of exploring participants' subjective experiences within a bounded institutional setting (Patton, 2002; Ghafar, 2020).

4.3 Data collection

Data was gathered through semi-structured interviews, a method that balances exploratory depth with consistency across respondents (Adenike, 2021). Interview protocols were designed to explore participants' perceptions, experiences, and challenges related to

entrepreneurship education, with prompts aligned to the core research objectives.

Examples of guiding questions for students included:

- i How has your understanding of entrepreneurship evolved since engaging in university programs?
- ii In what ways has entrepreneurship education influenced your self-identity or sense of self-efficacy?

Interview questions for lecturers and managers explored curriculum design, mentorship approaches, institutional policies, and perceived barriers to supporting entrepreneurial development. Due to geographical and scheduling constraints, interviews were conducted via video conferencing platforms. To investigate the core themes of entrepreneurial mindset, identity, and self-efficacy, the study utilized three tailored semi-structured interview guides, each adapted to the specific role of the participant group. While the overarching themes remained consistent throughout all interviews, the questions were refined to ensure relevance and clarity for each group. For postgraduate students, the interview prompts focused on personal learning experiences, skill development, and evolving perceptions of entrepreneurship. For lecturers, the questions examined curriculum design, pedagogical approaches, and observations of student transformation. For university managers, the guide addressed institutional policy, resource allocation, and strategic initiatives in support of entrepreneurship education. In addition, triangulation was achieved through the integration of data across these three distinct participant groups. Comparing and contrasting narratives from students, lecturers, and managers, the analysis identified areas of convergence. All interviews were recorded with participants' consent and subsequently transcribed verbatim to ensure accuracy during the analytical process.

Interview protocols were developed around the core themes of entrepreneurial mindset, identity, and self-efficacy, with tailored guides for students, lecturers, and managers. Example questions for students included: "How has entrepreneurship education influenced your confidence or sense of identity?" For lecturers: "How do you see your role in influencing entrepreneurial thinking among students?" For managers: "What institutional policies or structures influence student entrepreneurship on campus?"

This study was conducted within a single-institution case study, which limits the generalizability of findings. However, the university represents a typical public institution in the Eastern Cape and reflects main challenges common in under-resourced regions. While the findings are not intended to be statistically generalizable, they provide transferable insights into how entrepreneurship education is experienced in similar environments.

4.4 Saturation, sampling justification, reflexivity and bias mitigation

The final sample comprised 24 participants. Thematic saturation was reached after 20 interviews, when no new codes or insights were emerging from the data. Four additional interviews were conducted to ensure depth and confirm the stability of findings; this approach aligns with established practices in qualitative research for achieving

analytical sufficiency rather than statistical generalizability (Guest et al., 2006). As the primary researcher held an academic role at the study site, reflexivity was maintained throughout the research process to identify and minimize potential bias. Sampling decisions were transparently guided by pre-established inclusion criteria. Interview data were triangulated across participant groups to enhance trustworthiness. Peer debriefing, member checking, and a clear audit trail of decisions were employed to strengthen credibility and reduce interpretive bias.

5 Presentation of findings

Data were analyzed using thematic analysis following Braun and Clarke's (2006) six-phase approach. Initial open coding was conducted on a subset of transcripts to identify recurring concepts. Coding was conducted using a hybrid approach, combining deductive codes derived from the theoretical framework (e.g., perceived behavioral control, self-efficacy, skill acquisition) and inductive codes that emerged organically from the data (e.g., informal entrepreneurship, funding bottlenecks, mindset shifts). A codebook was developed to ensure consistency in coding. This included code definitions, decision rules, and illustrative quotes. Themes were developed through constant comparison and reviewed collaboratively to ensure credibility. To enhance transparency and visual clarity, a thematic map (Figure A1) has been included to show the relationship between codes, categories, and overarching themes.

The findings of this study reveal transformative shifts in postgraduate students' entrepreneurial mindset, identity, and self-efficacy shifts largely attributed to their engagement with structured entrepreneurship education. Drawing on insights from 24 semi-structured interviews with postgraduate students, lecturers, and university managers at a university in South Africa's Eastern Cape, the analysis identifies how experiential learning, mentorship, and institutional factors interact with personal development. These findings are interpreted through the integration of the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Human Capital Theory (HCT), offering a perspective on the role of entrepreneurship education in a high-unemployment region. Table 1 presents a summary of key themes and theoretical alignment.

Participant identifiers: PG1–PG10 (Postgraduate Students), L1–L7 (Lecturers), M1–M7 (Managers) (Table 2).

5.1 Entrepreneurial mindset and identity formation

A central finding of this study is the conceptual shift in how postgraduate students understand entrepreneurship. Prior to engaging in entrepreneurship education, most students described viewing entrepreneurship narrowly as the act of starting a business or pursuing profit-driven ventures. However, following program participation, many articulated an interpretation of entrepreneurship as a mindset involving innovation, opportunity recognition, and value creation. This transformation aligns with the Theory of Planned Behavior (Ajzen, 1991), which suggests that changes in attitudes significantly influence behavioral intentions.

TABLE 1 Summary of key themes and theoretical alignment.

Theme	Description	Supporting theories
Transformation of entrepreneurial mindset	Shift from business-centric to mindset-centric view of entrepreneurship; emphasis on innovation, resilience, and value creation.	Theory of planned behavior (TPB), Human capital theory (HCT)
Entrepreneurial identity formation	Entrepreneurship education is a catalyst for redefining self-concept and aligning personal values with entrepreneurial goals.	Social cognitive theory (SCT), TPB
Self-efficacy development	Enhanced confidence through experiential learning, mentorship, and practical engagement; key role of self-belief.	Social cognitive theory (SCT), TPB
Institutional influence and barriers	Institutional constraints, such as a lack of funding, policy resistance, and inadequate practical training opportunities, exist.	Social cognitive theory (SCT), TPB, HCT
Socio-economic impact	Entrepreneurship education is linked to employability, community development, and regional economic empowerment.	Human capital theory (HCT)
Resource gaps and limited impact	Skills gained are not matched by access to funding and networks; calls for ecosystem support and resource allocation.	Human capital theory (HCT), TPB

Source: Authors' computation.

"Before the course, I thought entrepreneurship was just about starting a business. Now, I see it as a way of thinking, a way of approaching problems with creativity and a solutions-oriented approach." (PG2).

"I used to think entrepreneurship was only for businesspeople, but now I understand it's more about identifying opportunities and acting on them, no matter what field you are in." (PG6).

These insights were echoed by other student participants, who described entrepreneurship as a cognitive and attitudinal orientation rather than a purely vocational activity:

"For me, it's become about how I think and solve problems, not just owning a business. It's about creating value wherever you are." (PG10).

This transformation was attributed to experiential pedagogical strategies, including business simulations, innovation challenges, and reflective tasks. Such approaches promoted learning by doing and deeper internalization of entrepreneurial thinking; this aligns with

TABLE 2 Themes/Concepts.

Themes/Concepts	Postgraduate students (10)	Lecturers (7)	Managers (7)
Entrepreneurial mindset and identity	✓ (Perceptions, motivation)	✓ (Curriculum, teaching methods)	✓ (Organizational support)
Self-efficacy and skills development	✓ (Confidence, experiential learning)	✓ (Mentorship, pedagogical strategies)	✓ (Resource provision, policy)
Perceived barriers and constraints	✓ (Funding, access, socio-cultural norms)	✓ (Curriculum limitations, resource gaps)	✓ (Institutional policies, funding)
Mentorship and social modeling	✓ (Exposure to role models)	✓ (Mentorship programs, community engagement)	✓ (Leadership, strategic vision)
Impact of entrepreneurship education	✓ (Knowledge, attitude shifts)	✓ (Curriculum design, experiential learning)	✓ (Institutional initiatives)
Institutional support and policies	✓ (Access to resources, opportunities)	✓ (Curriculum, mentorship support)	✓ (Policy development, infrastructural support)
Resource gaps and opportunities	✓ (Funding, practical training)	✓ (Curriculum resources, networks)	✓ (Funding, infrastructural support)

The checkmarks indicate the involvement or influence of each group in each theme. Source: Authors' computation.

findings from [Man et al. \(2024\)](#) and [Ncanywa et al. \(2022\)](#), which show the impact of entrepreneurial exposure on mindset and self-concept. From the perspective of lecturers, the development of an entrepreneurial mindset was seen as an intentional learning performance. Educators emphasized that the curriculum was designed to reframe entrepreneurship as a transferable, interdisciplinary skillset:

"We do not just teach business plans. We design activities that push students to reflect on their identity and problem-solving approach." (L2).

"It's about building a mindset, encouraging students to take initiative, think creatively, and deal with uncertainty." (L4).

Some lecturers also underscored the normalization of failure as part of mindset development:

"Failure is part of the journey. If students can see that, they are more likely to try." (L3).

This reflects TPB's concept of perceived behavioral control, that is, when failure is seen as a learning opportunity rather than a deterrent, students are more likely to adopt entrepreneurial behavior. At the institutional level, university managers framed entrepreneurial mindset development within broader strategic goals such as

employability, regional development, and social impact. While their emphasis was more systemic, they recognized the importance of cultivating an entrepreneurial outlook across disciplines:

“Critical thinking, innovation, and social impact—those are qualities we strive for across all disciplines.” (M6).

“We want to produce graduates who are not only employable but capable of creating opportunities in under-resourced environments.” (M1).

This institutional stance resonates with Human Capital Theory, which positions entrepreneurship education as a means of building adaptable, high-value skills that contribute to economic and social advancement (Auerbach and Green, 2024). Across all three participant groups, there was a shared recognition of the value of mindset transformation though each group approached it from a different angle: Students described internal changes in self-perception and confidence; Lecturers highlighted instructional strategies and pedagogical intentions; Managers contextualized mindset within institutional mission and policy; this triangulated perspective strengthens the credibility of the findings and the role of entrepreneurship education in influencing both individual identity and institutional direction.

5.2 Identity formation and self-efficacy

The development of entrepreneurial identity and self-efficacy emerged as a consistent theme across all participant groups. Drawing on the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Human Capital Theory (HCT), the findings illustrate how entrepreneurship education influences students' evolving sense of who they are and what they can achieve. TPB provides insight into how changes in attitude and perceived behavioral control influence intention formation (Ajzen, 1991). SCT explains the psychological mechanisms particularly social modeling and mastery experiences through which self-efficacy is cultivated (Bandura, 2001). HCT offers a structural lens, positioning skill development and knowledge acquisition as central to the entrepreneurial journey (Becker, 1964).

5.2.1 Student perspectives: confidence through experience

Postgraduate students frequently described a transformation in self-perception, attributing this to experiential learning and mentor engagement. These experiences helped bridge the gap between theoretical learning and real-world application, giving students a sense of entrepreneurial competence and identity.

“The mentorship program was a game-changer for me. Talking to someone who had built a business gave me the confidence to believe I could do it too.” (PG4).

“Working on a real business idea and getting feedback helped me take myself seriously as an entrepreneur. It wasn't just theory anymore.” (PG1).

Several students highlighted the shift from doubt to belief:

“Before, I doubted whether I had what it takes. But once I presented my idea and got support, something shifted.” (PG8).

This aligns with SCT's emphasis on vicarious learning and social persuasion, confirming that structured exposure to entrepreneurial tasks enhances self-efficacy (Ratten and Jones, 2021; Zhao et al., 2022).

5.2.2 Lecturer perspectives: facilitating self-efficacy

Lecturers reported that entrepreneurship education was deliberately designed to cultivate both competence and confidence in students. Their observations affirmed that identity formation often stemmed from students' active involvement in practical tasks.

“We see a noticeable shift when students pitch ideas in front of others. Their posture, language, and belief in their potential start to change.” (L5).

Educators also emphasized their role in normalizing risk and failure as part of learning:

“We try to help them see that uncertainty is normal. Once they internalize that, they start acting more confidently.” (L2).

These reflections suggest that lecturers serve as both content facilitators and social models, reinforcing SCT's proposition that environment and reinforcement shape behavior.

5.2.3 Manager perspectives: institutional support for identity development

Managers viewed self-efficacy and identity development as important of entrepreneurship education, though often from a strategic or policy perspective.

“Leadership, negotiation, and communication—those are skills the program cultivates. But we also want students to believe they can lead projects and drive change.” (M7).

“We want to create an environment where students can try things and fail safely. That's how real confidence grows.” (M5).

Managers acknowledged that skill acquisition and institutional ethos work in tandem to support entrepreneurial identity, supporting HCT's assertion that investing in human potential yields long-term returns (Auerbach and Green, 2024).

Comparative Reflections and Challenges: Across all groups, there was shared agreement that self-efficacy grows through practice, mentorship, and institutional reinforcement. Students focused on the emotional and psychological shift in how they saw themselves. Lecturers emphasized teaching practices that encouraged confidence. Managers underscored the role of ecosystem design and support structures. However, several

participants also noted that institutional barriers could undermine these gains. One student reflected:

“There are times it feels like the university is against student businesses. Informal ventures get shut down.” (PG8).

This perception was confirmed by a lecturer:

“We teach entrepreneurial thinking, but the bureaucracy does not always support students trying to apply it.” (L3).

These accounts for the need for alignment between pedagogy, policy, and institutional culture, particularly in under-resourced environments. Without such alignment, efforts to promote entrepreneurial identity may be undermined by contradictory messages and constraints.

5.3 Institutional influence and barriers

While mentorship and experiential learning were seen as enablers of entrepreneurial development, participants also indicate that institutional constraints that weakened the translation of entrepreneurial intention into action; this theme was especially salient across all three participant groups, who identified gaps between entrepreneurship education and the university environment intended to support it.

5.3.1 Student perspectives: contradiction between theory and practice

Postgraduate students frequently expressed frustration with institutional policies that were seen as inhibiting real-world entrepreneurial practice. Despite being encouraged to think entrepreneurially, students reported facing resistance when attempting to implement business ideas on campus.

“They shut down informal businesses that were doing well. That’s demoralizing.” (PG9).

“We’re told to be entrepreneurial, but when we try to apply it in real life, like selling on campus or testing an idea, they stop us. It feels like a mixed message.” (PG5).

These comments reflect a perceived contradiction between the university’s rhetorical promotion of entrepreneurship and the practical barriers students encounter. According to Social Cognitive Theory (Bandura, 2001), such environmental hostility disrupts reciprocal determinism, weakening the confidence–action loop crucial for building entrepreneurial agency.

5.3.2 Lecturer perspectives: gaps in curriculum and implementation

Lecturers also acknowledged that structural barriers within the university ecosystem limited the effectiveness of entrepreneurship education. Some highlighted the absence of applied learning opportunities and pointed to systemic underinvestment in practical implementation.

“We’re taught concepts, but we do not get to implement them.” (L2).

“More practical experience would help students apply what they have learned in real scenarios.” (L6).

These critiques illustrate a disconnect between theoretical knowledge and real-world readiness, which has implications for Human Capital Theory: when institutions fail to support skill application, the return on educational investment in terms of employability and innovation capacity is diminished (Becker, 1964).

5.3.3 Manager perspectives: policy, funding, and institutional priorities

University managers provided insight into the institutional rationale and constraints behind these limitations. While acknowledging the value of entrepreneurship education, they cited challenges such as limited funding, regulatory issues, and infrastructure gaps as barriers to effective implementation.

“We support entrepreneurship in principle, but we also must manage compliance, space, and student welfare. It’s a balancing act.” (M2).

“We need more funding streams dedicated specifically to student entrepreneurship—not just competitions, but long-term incubation.” (M5).

This institutional viewpoint reveals the structural bottlenecks that contribute to students’ negative perceptions. The Theory of Planned Behavior helps explain this dissonance: even when students develop entrepreneurial intention, perceived behavioral control is reduced by external barriers (Ajzen, 1991), limiting follow-through.

5.3.4 Overcoming constraints: resilience and internal agency

Despite these challenges, many students described a resilient mindset enabled by the internal gains from entrepreneurship education. This was reflected in their ability to reinterpret failure and navigate structural adversity.

“I used to be afraid of failure, but now I see it as part of the process. The course taught me how to learn from my mistakes.” (PG7).

This internalization aligns with SCT’s emphasis on mastery experiences and personal agency, suggesting that educational design can act as a buffer against institutional shortcomings (Vodă and Florea, 2019).

Managers and lecturers also reported observing:

“Students come back with new ideas even after rejection. That’s what we want—persistence.” (L4).

“Some of the most engaged students are those who have failed before and tried again.” (M3).

5.3.5 Recommendations for institutional alignment

Participants across all groups advocated for better alignment between curriculum and ecosystem. Suggestions included creating

university-backed incubation spaces, reducing policy contradictions, and increasing access to seed funding. These findings underscore the need for universities especially in under-resourced regions like the Eastern Cape to build a cohesive entrepreneurial support system that integrates policy, pedagogy, and infrastructure.

“The university needs to stop treating student entrepreneurs like rule-breakers and start seeing them as innovators.” (PG6).

5.4 Socio-economic impact

Participants across all three groups show the socio-economic value of entrepreneurship education, with students, lecturers, and managers connecting skill acquisition to individual empowerment, community upliftment, and national development. These views are closely aligned with Human Capital Theory (HCT), which posits that investment in education enhances individual productivity and contributes to broader economic growth (Becker, 1964).

5.4.1 Student perspectives: empowerment through skill acquisition

Postgraduate students described entrepreneurship education as a tool for economic agency and employability, citing the development of transferable skills such as strategic planning, financial management, and opportunity recognition.

“The skills I learned in the entrepreneurship course have been invaluable. I now have a much better understanding of how to manage finances, develop a business plan, and identify market opportunities.” (PG3).

“Even if I do not start a business right away, I feel more confident applying for jobs because I can demonstrate thinking, planning, and resource management.” (PG7).

“I used to think business skills were only for entrepreneurs, but now I realize these are life skills how to solve problems, pitch ideas, manage money. It changes how I see my career.” (PG6).

For many, entrepreneurship education was seen not just as a business-building tool, but as a platform for social mobility and future readiness.

5.4.2 Lecturer perspectives: capacity building and economic value

Lecturers viewed entrepreneurship education as a means of equipping students with market-relevant competencies, especially in a socio-economic context marked by high unemployment and limited job absorption.

“Entrepreneurship courses give students alternatives. Not everyone will find a job, but they can create something. That’s powerful.” (L1).

“We focus on building thinking, adaptability, and communication—skills that make students valuable in any sector, not just business.” (L3).

Lecturers also emphasized the non-linear career paths of many graduates and saw entrepreneurship education to economic adaptability.

5.4.3 Manager perspectives: entrepreneurship as development strategy

University managers emphasized the macroeconomic implications of student entrepreneurship. They viewed entrepreneurship education not only as a pedagogical tool but as a strategic investment in regional development.

“Entrepreneurship drives economic success—for the entrepreneur and for the country.” (M4).

“In provinces like the Eastern Cape, we need graduates who can create jobs—not just seek them. Entrepreneurship education is a development tool.” (M6).

These statements show a shared belief that entrepreneurship can reduce economic exclusion and support inclusive growth in under-resourced areas. This aligns with HCT’s macro-level framing of education as a driver of national productivity and regional transformation (Auerbach and Green, 2024).

5.4.4 Social impact and community consciousness

Interestingly, several participants particularly students, linked personal empowerment to community upliftment, framing entrepreneurship as a socially conscious practice.

“It’s not just for personal success. It’s for community development and sustainability.” (PG5).

This suggests a growing pro-social orientation among student entrepreneurs, reinforcing the idea that entrepreneurship education can promote economic readiness and civic responsibility. In this sense, HCT’s model of returns on education extends beyond economic output to include social value creation.

5.5 Resource gaps and limited impact

While participants acknowledged the value of entrepreneurship education in influencing mindset and skill development, they also identified persistent resource constraints that limited the practical application of their entrepreneurial capabilities; this theme indicates the tension between individual readiness and unpreparedness, particularly in under-resourced university.

5.5.1 Student perspectives: frustration with implementation gaps

Postgraduate students frequently expressed that despite acquiring valuable skills, they lacked the financial capital, social networks, and institutional support required to launch or sustain entrepreneurial initiatives.

“I have the skills, but I do not have the money or the connections to start my own business. It’s frustrating.” (PG8).

"You come out of the course motivated and ready, but then reality hits. Without funding or someone to open doors for you, your ideas just stay on paper." (PG2).

"We're taught to be innovative, but no one talks about how hard it is to get a loan or find a mentor when you do not come from the right background." (PG10).

These narratives reflect a gap between entrepreneurial intention and execution, confirming findings by Henry et al. (2025), who argue that without an enabling environment, education alone cannot activate entrepreneurial behavior.

5.5.2 Lecturer perspectives: curricular limitations and infrastructure shortfalls

Lecturers also acknowledged this disconnect, noting that while students gained theoretical competence, universities often lacked the infrastructure to support applied learning and venture development.

"We're training them to be entrepreneurial, but we are not giving them the ground to stand on." (L7).

"There's a mismatch between what we teach and what students can do once they leave class. They need more than content, they need platforms." (L5).

This points to a curricular–ecosystem gap, where classroom learning is not complemented by incubators, funding schemes, or community partnerships that facilitate entrepreneurial practice.

5.5.3 Manager perspectives: policy and ecosystem constraints

Managers offered a strategic lens on the issue, linking resource constraints to institutional priorities, policy fragmentation, and external funding dependencies.

"We're limited in how much we can offer. Entrepreneurship funding often competes with other institutional needs." (M4).

"We need more public-private partnerships. Government and industry have a role in helping us build an entrepreneurial ecosystem." (M2).

These insights frame the issue not merely as an internal failure, but as a broader ecosystemic challenge that requires coordinated action across stakeholders.

5.5.4 Structural capital and human capital: a missing link

Across all three groups, the theme of resource dependency emerged as a key constraint. Students, lecturers, and managers recognized that skill acquisition alone was insufficient without structural capital such as funding, mentorship, regulatory support, and dedicated innovation spaces.

"We need support structures not just courses. We need space to try things out." (PG9).

This aligns with Human Capital Theory's assertion that educational returns are dependent on the context in which skills are applied (Becker, 1964). As M1 noted, even when students gain soft skills like negotiation and leadership, the absence of enabling infrastructure results in under-leveraged potential.

"We focus on transferable skills, but they need somewhere to apply them. Otherwise, it ends at the classroom." (M1).

5.5.5 Call for institutional alignment

Participants across groups advocated for a reimagining of university-level entrepreneurship support, including the introduction of seed funding, student incubators, venture mentoring, and policy reforms to support informal entrepreneurial initiatives.

"There's no support if you want to test an idea informally, selling food, offering a service, anything. That has to change." (PG6).

Aligning institutional structures with regional needs, particularly in economically marginalized provinces like the Eastern Cape, may unlock greater returns on educational investments and transform entrepreneurship education from a mindset-building tool to a developmental lever.

5.6 Descriptive summary of key findings

Tables 3 and 4 show the participant profile table and theme-by-group frequency table (Estimated). The narrative summary points are as follows: thematic saturation was achieved by the eighth postgraduate interview, at which point no new core concepts related to mindset, identity, or self-efficacy emerged; this confirms the adequacy of the sample size for qualitative depth and diversity; Notably, 9 out of 10 postgraduate participants described a significant shift in entrepreneurial mindset, while 8 explicitly attributed enhanced self-efficacy to mentorship and experiential learning activities.

6 Conclusion and policy recommendations

This study employed a qualitative case study design to investigate the determinants affecting entrepreneurial development among postgraduate students at a South African university in the Eastern Cape. Through 24 semi-structured interviews with students, lecturers,

TABLE 3 Participant profile table.

Participant type	N	Role/Function
Postgraduate students (PG1–PG10)	10	Participants in entrepreneurship education, across various disciplines
Lecturers (L1–L7)	7	Taught entrepreneurship courses; insight on pedagogy
Managers (M1–M7)	7	Institutional oversight and program support roles

Source: Authors' computation.

TABLE 4 Theme-by-group frequency table (estimated).

Theme	Students (10)	Lecturers (7)	Managers (7)	Notes
Mindset shift	9	6	5	Cited across all groups with strong agreement
Identity formation	8	4	5	Focus on self-concept transformation
Self-efficacy via mentorship	8	6	7	Mentorship is cited as essential by most participants
Institutional barriers	6	3	6	Examples include policy struggles, limited funding
Resource Constraints	7	5	6	Frequently mentioned challenge
Socio-economic impact	5	3	5	Broader developmental framing

Source: Authors' computation.

and university managers, the research examines how entrepreneurship education contributes to the formation of the entrepreneurial mindset, identity, and self-efficacy. Thematic analysis, guided by an integrated theoretical framework comprising the Theory of Planned Behavior (TPB), Social Cognitive Theory (SCT), and Human Capital Theory (HCT), enabled an interpretation of participants' lived experiences within economic precarity and institutional challenges.

The findings demonstrate that entrepreneurship education plays a significant role in how students conceptualize entrepreneurship. Initially perceived as a business-centric activity focused on profit-making, entrepreneurship was progressively redefined by participants as a mindset oriented toward innovation and problem-solving. This transformation is consistent with TPB's assertion that changes in attitude significantly influence intention formation. Moreover, experiential learning and mentorship emerged as mechanisms through which students developed self-efficacy and a strengthened entrepreneurial identity. These elements align closely with SCT, which emphasizes the importance of mastery experiences, vicarious learning, and social strengthening in influencing behavior. However, the data also reveal persistent institutional and structural barriers that hinder the full realization of entrepreneurship education's potential. Participants identified a lack of practical training, limited access to startup funding, and restrictive university policies as key obstacles that reduce perceived behavioral control and undermine entrepreneurial intention. Although students reported gaining essential competencies such as financial literacy, leadership, and strategic thinking, many expressed frustration over their inability to activate these skills in the real world. These limitations reflect core concerns raised in HCT, particularly the notion that human capital investments yield limited returns without enabling environments.

To address these constraints, the findings point to the need for a more institutional infrastructure that supports entrepreneurial development. Establishing a dedicated entrepreneurship center that provides seed funding, sustained mentorship, and access to entrepreneurial networks would help mitigate resource barriers and promote an environment where entrepreneurial behavior is both supported and normalized. Such improvement would enhance students' agency and intention to pursue entrepreneurial ventures, reinforcing the behavioral components outlined in both TPB and SCT. Curriculum reform also emerges as an area of focus. Embedding entrepreneurship education with real-world relevance through case studies, startup simulations, interdisciplinary projects, and exposure to social entrepreneurship can enhance the practical applicability of knowledge and improve entrepreneurial readiness; this approach aligns with HCT's emphasis on education as a tool for skill-building and economic empowerment. Pedagogy must evolve to incorporate

experiential and participatory methods that allow students to practice entrepreneurial thinking in meaningful, low-risk environments.

Academic staff play a role in this transformation. Strengthening faculty expertise in entrepreneurship education through professional development, industry engagement, and pedagogical innovation is essential to ensure that lecturers are equipped to bridge the gap between theory and practice. Faculty who are actively engaged with entrepreneurial teaching can better facilitate learning with contemporary challenges and opportunities in entrepreneurship. Engaging the community can further support entrepreneurship education's impact. Strategic partnerships with local businesses, government entities, and nonprofit organizations can offer students authentic learning opportunities such as internships, consulting assignments, and collaborative ventures. These engagements may provide experiential depth and contribute to the university's civic mission and the region's socio-economic development. Such external linkages enable the activation of entrepreneurial knowledge, helping to solidify self-efficacy and professional identity. Institutional policies must also evolve to support rather than stifle entrepreneurial aspirations. Reducing bureaucratic barriers, legitimizing informal student ventures, and offering accessible micro-financing mechanisms are essential components of a supportive entrepreneurship. Without such measures, the skillsets and mindsets cultivated through education risk remaining underutilized.

6.1 Limitations and suggestions for future research

This study provides insights into how entrepreneurship education impacts the entrepreneurial mindset, identity, and self-efficacy of postgraduate students in a high-unemployment environment, integrating the Theory of Planned Behavior, Social Cognitive Theory, and Human Capital Theory. However, the study is limited by its single-institution scope and qualitative design, which may restrict the generalizability of its findings. Future research could adopt a mixed-methods approach across multiple institutions or regions to compare how contextual factors affect entrepreneurship. Longitudinal studies tracking students beyond graduation would also be valuable for assessing the long-term impact of entrepreneurship education on venture creation and career trajectories. Likewise, this study did not disaggregate findings by gender, discipline, or socio-economic status. Future research could employ an intersectional lens to explore how different demographic and contextual factors shape students'

entrepreneurial development. Such an approach may reveal important variations in self-efficacy, mindset, or perceived structural barriers across groups.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

Ethics statement

The studies involving humans were approved by the Senate Research Ethics Committee (SREC) of Walter Sisulu University, South Africa. The protocol number for the study is FEDFREC 2454, with authorization granted on 21 October 2024 and valid until 21 October 2027. Prior to participation, written informed consent was obtained from all participants. Participation was voluntary, and respondents were assured of confidentiality and anonymity. All procedures involving human participants were conducted in accordance with the ethical standards of the institutional research committee and the 1964 Helsinki Declaration and its later amendments.

Author contributions

NC: Project administration, Methodology, Visualization, Data curation, Validation, Conceptualization, Software, Writing – original draft, Formal analysis, Resources, Investigation. TN: Data curation, Project administration, Validation, Conceptualization, Methodology, Supervision, Investigation, Funding acquisition, Writing – original draft, Resources, Writing – review & editing, Formal analysis,

Software, Visualization. AA: Funding acquisition, Writing – review & editing, Resources, Methodology.

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

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Appendix

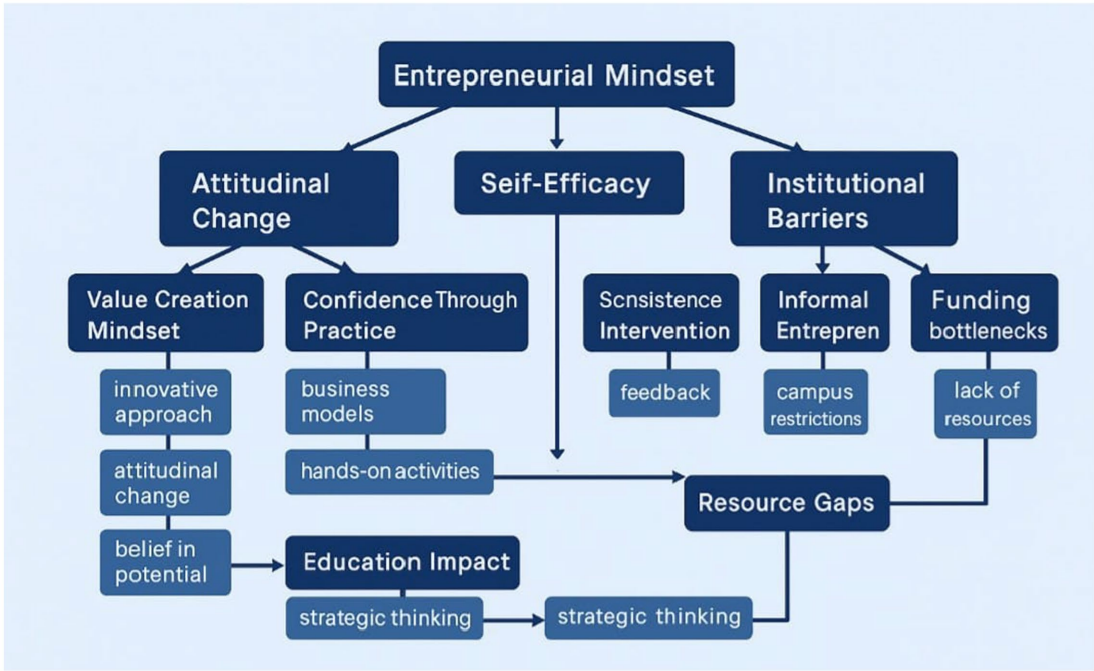


FIGURE A1
Thematic map of entrepreneurial development among postgraduate students.