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THE INFLUENCE OF UNIVERSITY-BASED INCUBATION PROGRAMS ON STUDENT ENTREPRENEURS' BUSINESS SUCCESS: MODERATING EFFECT OF SELF-EFFICACY IN SOUTH AFRICA

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ABSTRACT

The purpose of this study is to investigate the impact of specific components of university-based incubation programs, namely, mentorship, access to funding, networking opportunities, and infrastructure support, on the business success of student entrepreneurs in South Africa. Furthermore, it aims to investigate whether entrepreneurial self-efficacy moderates the relationship between these incubation elements and entrepreneurial outcomes. A quantitative, cross-sectional research design was employed. Data were collected via a structured questionnaire from a sample of 250 entrepreneurs. The proposed hypotheses were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS software, which is suitable for predictive analysis and modeling complex relationships with latent variables. The results provide strong support for the integrated model. All direct effects were significant: Entrepreneurial Self-Efficacy (β = 0.763), Mentorship (β = 0.614), Funding Access (β = 0.594), Infrastructure Support (β = 0.629), and Network Opportunity (β = 0.423) all had a positive and substantial influence on Business Success. Regarding moderation, a significant synergistic interaction was found only between ESE and Infrastructure Support (β = 0.075), indicating that higher self-efficacy enhances an entrepreneur's ability to leverage institutional resources. ESE did not significantly moderate the effects of Mentorship, Funding, or Networks, suggesting these resources provide broad, universal benefits. For practitioners and ecosystem builders, the findings underscore the need for dual-focused strategies: 1) Actively design programs to build entrepreneurs' psychological capital (self-efficacy), and 2) ensure reliable access to mentorship, funding, networks, and, critically, user-friendly institutional infrastructure. Policymakers should create support systems that are both resource-rich and confidence-building. This study presents a nuanced, empirically validated framework that elucidates how internal agency, and external resources jointly contribute to success. It uniquely identifies Infrastructure Support as the key resource whose effectiveness depends on the entrepreneur's self-efficacy, offering a refined perspective for theory and a targeted guide for practice.

KEYWORDS: Entrepreneurial Success, Entrepreneurial Self-Efficacy, Mentorship, Funding Access, Network Opportunity, Infrastructure Support, PLS-SEM, Entrepreneurial Ecosystem.

1. INTRODUCTION

University-based business incubators have emerged as strategic instruments in the global higher education landscape, designed to catalyse student entrepreneurship by providing critical early-stage resources. These incubators offer integrated support systems that encompass infrastructure, seed funding, expert mentorship, and strategic networking, collectively aiming to bridge the gap between theoretical academic knowledge and practical venture creation (Bergek & Norrman, 2008). By doing so, they play a pivotal role in developing essential entrepreneurial competencies, fostering innovative mindsets, and mitigating the inherent "liability of newness" faced by nascent ventures (Pauwels et al., 2016). In the South African context, characterised by pressing socio-economic challenges such as high youth unemployment and the urgent need for sustainable economic development, these incubators are increasingly viewed as vital mechanisms for stimulating innovation and generating youth-led employment (Ndou, 2022). Empirical studies within the region affirm their potential; for instance, Anderson and McKenzie (2020) documented that a structured incubation programme led to significant improvements in venture sales and job creation, while Zondo and Zhou (2023) found that incubated SMEs consistently outperformed their non-incubated counterparts.

Despite documented benefits, the operational effectiveness and impact of these programmes are not unequivocal. Significant challenges persist, including inconsistencies in the quality of mentorship, disparities in resource allocation, and the complex tension students face in balancing academic demands with business development (Urban, 2022). Moreover, while international literature robustly links incubation support to enhanced entrepreneurial outcomes, much of this evidence originates from developed economies with mature entrepreneurial ecosystems. This raises critical questions about the transferability of such models to developing contexts, such as South Africa, where systemic constraints, including funding scarcity, infrastructure limitations, and varied student preparedness, fundamentally shape the incubation environment (Mahadea et al., 2021).

A further limitation in extant research is the tendency to treat incubation support as a monolithic construct, thereby obscuring the distinct and potentially varied contributions of its individual components: mentorship, access to funding, networking, and infrastructure (St-Jean & Tremblay, 2020). Concurrently, scholarly attention is increasingly directed toward the critical role of internal psychological factors, particularly entrepreneurial self-efficacy (ESE) an individual's belief in their capability to successfully execute entrepreneurial tasks (Newman et al., 2019). ESE is a known driver of entrepreneurial intention, resilience, and venture performance, yet its function as a moderating variable that may amplify or diminish the impact of external incubation support remains inadequately explored, especially among student entrepreneurs in emerging economies (Urban & Kujinga, 2017).

In response to the identified gaps, this study aims to provide a nuanced and multidimensional analysis of university-based incubation in South Africa. Specifically, it seeks to assess the individual impact of four key incubation components: mentorship, funding access, networking opportunities, and infrastructure support, on the business success of student entrepreneurs. Furthermore, it investigates the critical moderating role of entrepreneurial self-efficacy in these relationships. By adopting this integrated framework, the research moves beyond a generic assessment of incubation to disentangle the specific mechanisms through which institutional support interacts with psychological preparedness to influence entrepreneurial outcomes.

The findings of this study are positioned to make three key contributions. Theoretically, it advances models of incubation effectiveness by integrating ESE as a salient moderating variable. Empirically, it addresses a contextual deficit by generating evidence from the South African higher education sector, thereby enriching the global discourse with perspectives from a developing economy. Practically, the insights derived will offer actionable guidance to incubation managers, university administrators, and policymakers for designing more targeted, effective support programmes that simultaneously address external resource gaps and internal capability development, ultimately enhancing the success of student-led ventures.

1.1. Purpose Of the Study

The purpose of this study is to investigate the impact of specific components of university-based incubation programs, namely, mentorship, access to funding, networking opportunities, and infrastructure support, on the business success of student entrepreneurs in South Africa. Furthermore, it aims to investigate whether entrepreneurial self-efficacy moderates the relationship between these incubation elements and entrepreneurial outcomes.

1.2. Research Objectives

i. To assess the influence of mentorship provided through university incubation programs on student entrepreneurs' business success.
ii. To determine the effect of funding access on business success among student entrepreneurs.
iii. To analyse the influence of networking opportunities on business success outcomes.
iv. To evaluate the impact of infrastructure support on student business success.
v. To examine the moderating effect of entrepreneurial self-efficacy on the relationship between incubation program components and business success.

2. LITERATURE REVIEW

2.1. Theoretical Grounding

This study is grounded in two complementary theoretical frameworks that together provide a robust lens for understanding how external support and internal psychological resources interact to influence entrepreneurial success. The Resource-Based View (RBV) explains the strategic value of the tangible and intangible assets provided by incubators, while Social Cognitive Theory (SCT) elucidates the cognitive processes through which entrepreneurs appraise and utilise these resources. This integrated theoretical approach moves beyond simplistic input-output models to capture the complex mechanism of venture development.

2.2.1. Resource-Based View (Rbv)

The Resource-Based View posits that a firm's competitive advantage stems from its unique, valuable, and difficult-to-imitate internal resources (Barney, 1991). Within the VRIN/VRIO framework, resources must be "Valuable", "Rare", "Inimitable", and "Organised" to be exploited. Applied to university-based incubation, the program is conceptualised as a curated bundle of strategic resources for nascent student ventures (Theodoraki et al., 2020). These can be categorised as: Tangible Resources, which include direct funding, physical workspace, and specialised equipment. These are "valuable" as they lower prohibitive start-up costs (Ngonisa et al., 2023). Intangible Resources include Expert mentorship and access to dense, trusted networks. These are often rare, "inimitable" due to social complexity, and constitute a "non-substitutable" support system. The tacit knowledge transferred through mentorship and the social capital embedded in incubator networks are classic sources of sustainable advantage (Lea et al., 2025; Tech Network, 2025).

The RBV thus provides a direct theoretical basis for hypothesising that access to these incubation components enhances a venture's foundational capacity, leading to superior performance. However, the static nature of the traditional RBV has been critiqued in dynamic entrepreneurial contexts, leading to the dynamic capabilities' perspective, which emphasises the venture's ability to integrate, reconfigure, and renew resources (Teece et al., 1997). A contemporary view of incubation is that it must not only provide resources but also cultivate these dynamic capabilities within the student entrepreneur.

2.2.2. Social Cognitive Theory (Sct)

Social Cognitive Theory explains human agency through triadic reciprocal causation between personal factors, behaviour, and the environment (Bandura, 1986). Its central construct, self-efficacy, the belief in one's capability to execute courses of action, is paramount. In entrepreneurship, this manifests as Entrepreneurial Self-Efficacy (ESE), a robust predictor of intent, effort, and persistence (Newman et al., 2021; McGee et al., 2009). SCT is crucial for this study as it theorises the "psychological mechanism" linking incubator resources (environment) to entrepreneurial action (behaviour). Efficacy beliefs are developed through four primary sources: Mastery Experiences, successfully completing entrepreneurial tasks (e.g., securing a first sale via incubator support). Vicarious Learning: Observing peers and mentors succeed within the incubator cohort. Verbal Persuasion: Encouragement and feedback from credible mentors and programme managers. Physiological States: A supportive environment reduces debilitating stress, allowing for positive arousal.

Therefore, an incubator is theorised as a designed environment for building efficacy. The resources highlighted by RBV (funding, mentorship) serve as inputs for these four efficacy-building sources. SCT positions ESE not merely as an outcome but as a critical cognitive filter that moderates how effectively an entrepreneur converts external resources into successful venture behaviours (Murnieks et al., 2020). This integrated RBV-SCT framework posits that resources are necessary but insufficient; the entrepreneur's efficacy to leverage them is the critical intervening mechanism.

2.3. Empirical Literature Review

2.3.1. Mentorship

Mentorship in incubators involves a structured relationship for guidance and knowledge transfer. Empirical evidence underscores its multidimensional impact: Mentorship accelerates the entrepreneurial learning curve. Structured interventions significantly enhance strategic decision-making and help navigate cognitive barriers (Shams & Jamil, 2022; St-Jean & Audet, 2019). Mentors serve as conduits to critical contacts and provide legitimacy by association, which is crucial for securing additional resources (Davidsson & Honig, 2019; SA Woman Connect, 2025). Crucially, mentors provide emotional scaffolding, building resilience and helping manage the identity transition from student to entrepreneur, a factor strongly linked to persistence (Belitski & Heron, 2017; Kram, 2019).

2.3.2. Funding Access

Access to capital remains a primary barrier. In South Africa, structural biases in traditional financing exclude most student ventures (Ngonisa et al., 2023; Herrington & Kew, 2022). Incubators bridge this gap. Providing seed grants and, more importantly, building 'investment readiness' through financial modeling and pitch training. Incubator affiliation signals venture quality to external investors, reducing information asymmetry and facilitating faster, more favourable deals (Iwu, 2017; Egu & Chiloane-Tsoka, 2023).

2.3.3. Networking Opportunities

Networking is the strategic process of building social capital. Its impact is multi-dimensional. It is consistently rated as critical for survival, yet formal training is often lacking, highlighting the incubator's role in skill development (De Klerk, 2010). Networks provide diverse information that fuels innovation and business model adaptation. Heterogeneous networks (financial, business, and political) contribute differentially to success, with relational proximity enhancing both the speed and depth of knowledge transfer (Sendawula et al., 2023; Iqbal et al., 2018; Pereira & Andrade, 2021).

2.3.4. Infrastructure Support

Modern incubators offer integrated ecosystems that extend beyond simple office space, featuring maker labs, digital platforms, and specialised administrative support (Mezzari, 2024; Urban, 2024). Quality infrastructure reduces cognitive load and operational overhead, freeing significant time for core venture activities and accelerating development cycles (Theodoraki et al., 2020). Professional facilities also enhance the venture's credibility and perceived investment readiness to external stakeholders.

2.3.5. Entrepreneurial Self-Efficacy (Ese)

ESE is a well-established predictor of entrepreneurial action and persistence (Newman et al., 2021; Zhao et al., 2005). It is dynamically shaped within incubators. Mastery experiences, especially through iterative, simulation-based learning, are the most potent source of durable ESE gains (Martin et al., 2023; Patzelt & Shepherd, 2011). Vicarious learning from cohort peers and mentors, combined with psychological safety and persuasive feedback in mentor relationships, significantly builds efficacy beliefs (Ghosh & Fogel, 2022; Murnieks et al., 2020).

2.3.6. Business Success

For early-stage student ventures, success is a multidimensional construct. Contemporary measures extend beyond short-term profit to include revenue and employment growth, milestone achievements (e.g., prototype development, first revenue generation), and survival duration (Rauch et al., 2009; Balhico et al., 2023). Success also encompasses the learning, skills, and portable networks gained, regardless of the current venture's fate, a critical metric for student entrepreneurs. Literature consistently highlights the confluence of adequate and timely financial capital, diverse human capital in the founding team, and structured strategic planning as fundamental CSFs (Haltiwanger et al., 2025; Yu et al., 2023; Malesu & Syrovátka, 2025). Incubators aim to systematically address these factors.

The literature establishes strong individual connections between incubation resources, ESE, and venture success. However, critical gaps persist, particularly in the South African context: Most empirical evidence originates from developed economies, leaving a gap in understanding how incubation functions within the specific constraints of South Africa's entrepreneurial ecosystem. Research often treats incubation as a monolithic input, failing to disentangle the distinct effects and potential interactions of its core components (mentorship, funding, networking, infrastructure). While both incubation support and ESE are linked to success, few studies empirically test ESE's theorised role as a moderating variable that conditions the effectiveness of incubator resources. The integrated RBV-SCT framework proposed here remains under-tested.

This study directly addresses these gaps by investigating the discrete impacts of key incubation components on business success among South

African student entrepreneurs and, innovatively, by testing the moderating role of ESE in these relationships. This approach offers a more nuanced, mechanism-aware understanding of how university incubators generate value.

3. CONCEPTUAL MODEL AND HYPOTHESIS DEVELOPMENT

The following Figure 1 depicts the model that was conceptualised for the study

Figure 3.1: Conceptual Model

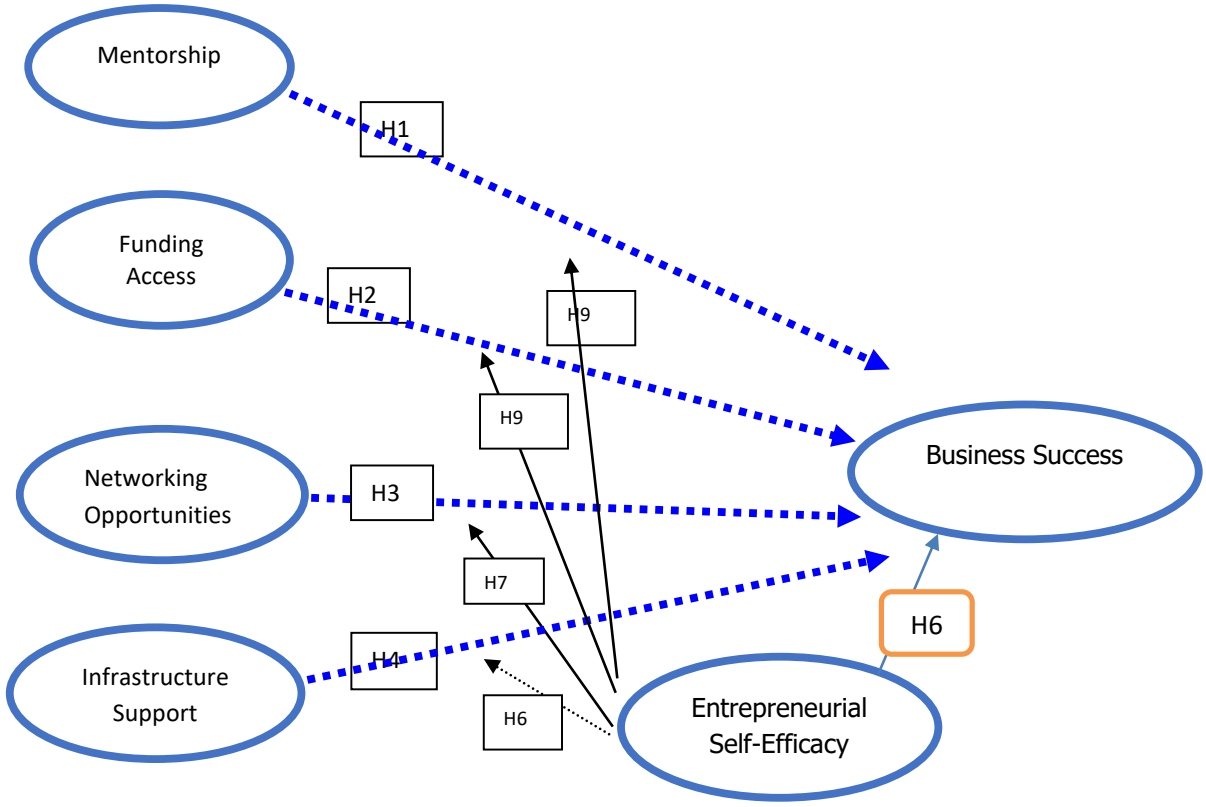

Figure 1: Research Model.

3.2 Hypothesis Development

3.2.1 Mentorship Programs and Business Success

The hypothesis is proposed based on the Resource-Based View (RBV), which positions mentorship as a valuable, rare, and tacit resource that enhances a venture's strategic capabilities (Theodoraki et al., 2020). Theoretically, mentorship operates through three pathways: strategic guidance for key decisions (Women Entrepreneurs, 2025), role modelling of entrepreneurial behaviour (Kram, 2019), and emotional support that builds resilience (Belitski & Heron, 2017). This conceptual argument is strongly corroborated by empirical evidence. Studies show that mentored entrepreneurs gain significantly more strategic contacts (Davidsson & Honig, 2019), achieve profitability faster (Huang & Yoong, 2021), and, crucially in the relevant context, exhibit 47% higher venture survival rates (Mbewana & Mokoena, 2023). Therefore, a direct positive relationship is hypothesised.

H1: University-based incubation mentorship programs positively influence the business success of student entrepreneurs.

3.2.2. Funding Access and Business Success

Justification and Supporting Literature: This hypothesis is grounded in the fundamental tenet of the RBV, which holds that financial capital is a critical resource for acquiring other assets and sustaining operations (Barney, 1991). The rationale extends beyond mere liquidity. Funding access enables focus on core value creation by reducing survival pressures (Haltiwanger et al., 2025), allows for longer planning horizons to improve venture quality (Egu &

Chiloane-Tsoka, 2023), and provides a certification effect that attracts further resources (Urban & Maphumulo, 2023). Empirical research consistently validates this link, demonstrating that adequate initial capital increases the probability of success (Haltiwanger et al., 2025) and that funded student ventures are 3.2 times more likely to achieve profitability (Herrington & Kew, 2022). Recent context-specific evidence shows a 68% growth advantage for funded incubated ventures (Van der Brug & Abrahams, 2024), justifying the proposed hypothesis.

(H2): University-based incubation funding access programs positively influence the business success of student entrepreneurs.

3.2.3 Networking Opportunities and Business Success

Justification and Supporting Literature: From an RBV perspective, networks are socially complex, path-dependent, and thus inimitable resources that provide access to external assets (Theodoraki et al., 2020). The theoretical mechanism is threefold: networks enhance innovation through complementary knowledge (Iqbal et al., 2018), transfer legitimacy to new ventures (SA Woman Connect, 2025), and provide critical market intelligence (De Klerk, 2010). Strong empirical support exists, with networking accounting for 44% of performance variance in small businesses (Sendawula et al., 2023). Most pertinently, research within the South African university context confirms that student entrepreneurs with diverse networks secure significantly more customer contracts and strategic partnerships (Thompson & Jacobs, 2024). This evidence solidly supports the hypothesised positive relationship.

(H3): University-based incubation networking opportunities positively influence the business success of student entrepreneurs.

3.2.4. Infrastructure Support and Business Success

Justification and Supporting Literature: Infrastructure is hypothesised to be a valuable resource that reduces operational barriers, allowing entrepreneurs to focus on strategic tasks (Theodoraki et al., 2020). The theoretical link works by reducing cognitive and operational load, enabling rapid prototyping and iteration (Balhico et al., 2023), and enhancing venture credibility with stakeholders (Theodoraki et al., 2020). Empirical studies quantify these benefits, showing that infrastructure support frees up nearly 19 hours per week for core development (Theodoraki et al., 2020). Local evidence is compelling: infrastructure-supported student ventures reach key milestones months earlier and show 42% higher investor readiness (Mhlongo & Van der Merwe, 2023), with infrastructure quality accounting for 31% of early-stage progress (Jacobs & Pretorius, 2024). This forms the basis for H4.

H4: University-based incubation infrastructure support programs positively influence the business success of student entrepreneurs.

3.2.5. The Mediating Role of Entrepreneurial Self-Efficacy on Business Success

The text argues for a mediation model (ESE as the "central mechanism" that "translates" resources), not moderation. The hypotheses are therefore presented as a mediation model, which aligns with the cited literature (e.g., Khumalo & Dhliwayo, 2024; Obschonka et al., 2023). Rooted in Social Cognitive Theory, ESE determines an individual's choice of activities, effort, persistence, and resilience (Bandura, 1997). It is the foundational belief that drives entrepreneurial action and persistence in the face of challenges (McGee et al., 2009; Murnieks et al., 2020). This integrated model posits that the four incubation resources (independent variables) build ESE (the mediator), which in turn drives business success (the dependent variable). The theoretical rationale is that resources alone are insufficient without the psychological capacity to deploy them in the face of uncertainty (McGee et al., 2009). Each resource builds ESE via specific Social Cognitive Theory pathways: mentorship through verbal persuasion and vicarious learning (Ghosh & Fogel, 2022); funding through enabling mastery experiences (Murnieks et al., 2020); networking through social modelling (Newman et al., 2021); and infrastructure by creating enabling conditions for success (Martin et al., 2023).

Empirical support for this mediation logic is robust. Meta-analyses confirm that psychological mechanisms, such as ESE, explain more variance in success than direct resource effects (van der Loo & Jansen, 2024). Crucially, specific studies in incubation contexts find ESE mediates the effects of entrepreneurial support (Newman et al., 2021) and accounts for the majority of the relationship between resources and performance (Lanivich & Lyons, 2024; Khumalo & Dhliwayo, 2024). Therefore, a comprehensive mediation model is hypothesised.

H5: Entrepreneurial self-efficacy positively influences the business success of student entrepreneurs.

H6: Entrepreneurial self-efficacy mediates the positive relationship between university-based

incubation mentorship programs and business success.

H7: Entrepreneurial self-efficacy mediates the positive relationship between access to university-based incubation funding and business success.

H8: Entrepreneurial self-efficacy mediates the positive relationship between university-based incubation networking opportunities and business success.

H9: Entrepreneurial self-efficacy mediates the positive relationship between university-based incubation infrastructure support and business success.

4. METHODOLOGICAL ASPECTS

4.1. Research Philosophy and Approach

This study adopted a positivist research philosophy, positing an objective reality that can be measured independently of the researcher. Aligned with this worldview, a deductive approach was employed. This involved formulating specific hypotheses from established theoretical frameworks, namely, the Resource-Based View and Social Cognitive Theory, and designing a methodological strategy to empirically test these propositions (Creswell & Creswell, 2018; Saunders et al., 2019). This philosophical and methodological alignment ensured the research-maintained objectivity and facilitated the generalisation of findings.

4.2. Research Design and Strategy

A quantitative research strategy with a cross-sectional design was implemented. This design enabled the systematic collection of numerical data from a defined sample of participants at a single point in time. The quantitative strategy was optimal for objectively measuring the relationships between the study's constructs and for employing statistical techniques to test the hypothesised model, thereby supporting explanatory inferences (Bryman & Bell, 2015).

4.3. Population And Sampling

The target population consisted of student entrepreneurs who were current or recent participants in the Centre of Entrepreneurship and Rapid Incubator (Cefri) programs across multiple South African universities, with an estimated population (N) of 710. To ensure representativeness and minimise selection bias, a simple random sampling technique was utilised. The final sample size of 250 participants was determined by applying the Raosoft sample size calculator (with a 95% confidence level and 5% margin of error) and adhering to established guidelines for Structural Equation Modeling, which recommend a minimum sample size for model complexity (Hair et al., 2019; Kline, 2016; Taherdoost, 2016).

4.4. Data Collection and Instrument Design

Primary data were collected over a three-month period using a hybrid approach, distributing the survey both online (via Google Forms) and physically at university hubs to maximise response rates. The data collection instrument was a structured questionnaire comprising five key sections. The core constructs were measured using validated 5-point Likert scales (1 = Strongly Disagree to 5 = Strongly Agree): Incubation Program Components: Scales were adapted from established studies. Mentorship Ramalu et al. (2020), Funding Access was adopted and modified from (Rodriguez & Lieber, 2020), Networking was adapted from Mustofa et al. (2021), Infrastructure Support was adapted from Ramalu et al., (2020), was adapted from Entrepreneurial Self-Efficacy (ESE) was adapted from Bozward et al. (2022), and Business success was adapted from Bozward et al. (2022).

4.5. Data Analysis

Data analysis followed a structured, two-stage process using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS software. The psychometric properties of the scales were first evaluated. Reliability was confirmed using Cronbach's alpha and Composite Reliability (both> 0.7). Validity was established through convergent validity (Average Variance Extracted > 0.5) and discriminant validity using the Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio (Fornell & Larcker, 1981; Hair et al., 2019; Henseler et al., 2015). After establishing a robust measurement model, the structural paths were examined. Hypotheses were tested using a bootstrapping procedure with 5,000 subsamples to generate t-statistics and p-values. The model's explanatory power was assessed using R^2 values, effect sizes using f^2, and predictive relevance using the Stone-Geisser Q^2. The mediating role of Entrepreneurial Self-Efficacy was tested by examining the significance of specific indirect effects.

4.6. Ethical Considerations

This research adhered to the highest ethical standards. Prior to data collection, full ethical clearance was obtained from the Walter Sisulu University Ethics Committee. All participants

provided informed consent, having been clearly informed of the study's purpose, their right to voluntary participation, and the assurance of anonymity. Data were treated with strict confidentiality, stored on secure, password-protected servers, and accessed only by the core research team, in compliance with institutional and national data protection guidelines (Saunders et al., 2019).

5. RESULTS PRESENTATIONS

5.1. Demographic Profiling of Respondents

Table 1: Demographic Profiling of Respondents.

Variable	Description	Frequency	Percentage
Gender	Male	60,0	60,0
	Female	40,0	40,0
Age	Single	59,2	59,2
	Married	28,0	28,0
	Divorced	12,8	12,8
Marital Status	Student	42,0	42,0
	Employed	26,0	26,0
	Self Employed	16,4	16,4
	Unemployed	15,6	15,6
Qualification	Diploma	98	39,2
	Degree	83	33,2
	Post Grad	69	27,6
Occupation	Student	105	42,0
	Employed	65	26,0
	Self Employed	41	16,4
	Unemployed	39	15,6
Income level	R2000	99	39,6
	R2001- R50000	41	16,4
	R5001-R10000	34	13,6
	R10000+	76	30,4
Racial group	Black	91,6	91,6
	White	2,4	2,4
	Indian	3,2	3,2
	Coloured	2,8	2,8
Internet access	Always	143	57,2
	Sometimes	77	30,8
	Never	30	12,0
	Always	143	57,2

5.2. Structural Equation Modeling

Structural Equation Modeling (SEM) is an advanced multivariate statistical technique that allows researchers to analyse complex relationships among observed and latent variables simultaneously (Thakkar, 2020). Unlike traditional regression analysis, SEM accounts for measurement error, provides simultaneous estimation of multiple dependent relationships, and enables the testing of theoretical models with latent constructs (Hair, Hult, Ringle, & Sarstedt, 2021).

5.2.1. Measurement Model Assessment

Before testing the structural relationships among constructs, it is essential to assess the measurement model (the outer model) to ensure that the latent variables are measured reliably and validly. This section outlines the evaluation of the reflective measurement model based on four key criteria: indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. The analysis was conducted using SmartPLS, a software suitable for complex models that does not require multivariate normality assumptions.

5.2.1.1. Indicator Reliability

The results presented in Table 2 below, regarding indicator reliability as measured by factor loadings in what appears to be a Confirmatory Factor Analysis (CFA) or a similar measurement model, are generally strong and acceptable, though with a few minor exceptions. Overall, most loadings exceed the conventional threshold of 0.7, indicating a high degree of reliability, with each measured item (indicator) strongly and sufficiently related to its respective latent construct. For instance, constructs such as BS (all loadings > 0.79), IS (all loadings > 0.80), and M (with most loadings > 0.73) demonstrate excellent indicator reliability. However, there are a

few indicators with loadings slightly below the 0.7 benchmark, namely ESE1 (0.580), FA1 (0.591), M5 (0.600), and NO2 (0.634). While these loadings are moderately acceptable, especially in exploratory research or when the composite reliability of the construct is still adequate, they suggest that these items are weaker representatives of their intended latent variables (ESE, FA, M, and NO, respectively). This suggests that the underlying constructs for Entrepreneurial Self-Efficacy (ESE), Financial Access (FA), Mentorship (M), and Networking Opportunities (NO) may benefit from a review of these specific indicators to refine or clarify them in future research, thereby enhancing the robustness of the measurement model. Nonetheless, the high loadings for the other indicators within these same constructs help compensate, and the model, overall, shows a satisfactory level of reliability for most factors.

Table 2: Loadings.

ITEMS	BS	ESE	FA	IS	M	NO
BS1	0.802					
BS2	0.843					
BS3	0.790					
ESE1		0.580				
ESE2		0.803				
ESE3		0.770				
ESE4		0.843				
ESE5		0.775				
FA1			0.591			
FA2			0.780			
FA3			0.844			
FA4			0.730			
IS1				0.814		
IS2				0.825		
IS3				0.802		
IS4				0.802		
M1					0.736	
M2					0.827	
M3					0.773	
M4					0.780	
M5					0.600	
NO1						0.702
NO2						0.634
NO3						0.772
NO4						0.796

Keywords: Bs = Business Success. Ese=Entrepreneurial Self-Efficacy, Fa=Funding Access; Is=Infrastructure Support; M=Mentorship, No= Network Opportunity

5.2.1.2. Internal Consistency Reliability

The results presented in Table 5.16 indicate that the measurement model for the six entrepreneurial constructs demonstrates satisfactory to strong internal consistency reliability, as all values for Cronbach's alpha and composite reliability (rho_c) exceed the recommended threshold of 0.70, confirming that the items within each construct consistently measure the same underlying concept. For example, Infrastructure Support (IS) exhibits excellent reliability ($\alpha = 0.827$, $\rho c = 0.885$), while even the lowest-scoring construct, Network Opportunity (NO), remains acceptable ($\alpha = 0.741$, $\rho c = 0.818$). However, convergent validity, as assessed by Average Variance Extracted (AVE), presents a more varied picture. Three constructs, Business Success (AVE = 0.659), Infrastructure Support (AVE = 0.657), and Entrepreneurial Self-Efficacy (AVE = 0.577), exhibit strong convergent validity, indicating that their indicators robustly capture the intended latent variables. In contrast, Funding Access (AVE = 0.551), Mentorship (AVE = 0.558), and Network Opportunity (AVE = 0.531) show only marginal validity, with AVE values just above the 0.50 cutoff. This suggests that while these constructs are measurable, their indicators share a slightly weaker common core, likely due to the complex, multi-dimensional nature of external resources and social capital in entrepreneurship. Overall, the measurement model is reliable and valid enough to proceed with further analysis; however, the marginal AVE scores for FA, M, and NO suggest cautious interpretation and indicate potential for scale refinement in future research.

Table 3: Internal Consistency Reliability.

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
BS	0.753	0.799	0.853	0.659
ESE	0.818	0.863	0.871	0.577
FA	0.734	0.769	0.829	0.551
IS	0.827	0.830	0.885	0.657
M	0.802	0.820	0.862	0.558
NO	0.741	0.736	0.818	0.531

Keywords: Bs = Business Success. Ese=Entrepreneurial Self-Efficacy, Fa=Funding Access; Is=Infrastructure Support; M=Mentorship, No= Network Opportunity

5.2.1.3. Convergent Validity

Based on the Average Variance Extracted (AVE) values presented in Table 3 below, the measurement model's convergent validity is generally established, although it shows varying strengths across constructs. Convergent validity, which assesses the degree to which multiple indicators of a construct agree or converge, is considered adequate when the AVE is 0.50 or higher (Hair et al., 2019; Fornell & Larcker, 1981). All six constructs meet this minimum threshold, confirming that, on average, more than half of the variance in their respective indicators is captured by the latent construct rather than by measurement error.

Three constructs demonstrate strong convergent validity: Business Success (BS, AVE = 0.659), Infrastructure Support (IS, AVE = 0.657), and Entrepreneurial Self-Efficacy (ESE, AVE = 0.577). These results indicate that the items measuring these constructs are highly representative and share substantial common variance. For ESE, this aligns with the literature, which emphasises that self-efficacy is a robust, clearly measurable psychological trait in entrepreneurial studies and often exhibits strong internal coherence (Newman et al., 2019).

The remaining three constructs Funding Access (FA, AVE = 0.551), Mentorship (M, AVE = 0.558), and Network Opportunity (NO, AVE = 0.531)—possess acceptable but marginal convergent validity. Their AVE values are just above the 0.50 cutoff, suggesting that while the measures are adequate, a significant portion of variance (close to 45-47%) may be attributable to indicator-specific error. This is a common challenge when measuring complex, multi-faceted, or context-dependent entrepreneurial resources. For instance, measuring Funding Access can be complicated by the diversity of funding sources (e.g., bootstrapping, venture capital, grants) and the distinction between perceived and actual access, which can lead to less consistent responses (Brush et al., 2019). Similarly, Mentorship and Network Opportunity are inherently relational constructs whose quality and value can be subjective and vary greatly across different industrial or cultural contexts, potentially weakening the convergence of their indicators (St-Jean & Audet, 2012).

The findings, particularly the lower AVEs for FA, M, and NO, resonate with the academic literature, which calls for more refined, context-sensitive scales to capture external enablers and social capital dimensions in entrepreneurship (Davidsson et al., 2020). In summary, the model demonstrates sufficient convergent validity for all constructs to proceed with analysis, but researchers should interpret the results for FA, M, and NO with the understanding that their measurement could be further optimised in future studies to enhance precision and robustness.

Table 4: AVE.

Variable	Average variance extracted (AVE)
BS	0.659
ESE	0.577
FA	0.551
IS	0.657
M	0.558
NO	0.531

Keywords: Bs = Business Success. Ese=Entrepreneurial Self-Efficacy, Fa=Funding Access; Is=Infrastructure Support; M=Mentorship, No= Network Opportunity

5.2 .1.4. Discriminant Validity

Discriminant validity was evaluated using the Fornell–Larcker Criterion and the Heterotrait–Monotrait Ratio (HTMT).

i. Heterotrait-Monotrait Ratio (Htmt

Based on the results presented in Table 5, the discriminant validity of the core latent constructs in

the measurement model has been successfully established using the Heterotrait-Monotrait Ratio (HTMT) criterion. Discriminant validity confirms that each construct in the model is distinct and measures a unique concept, rather than merely reflecting another variable (Hair et al., 2019). The HTMT is a more modern and rigorous test than the traditional Fornell-Larcker criterion, with a conservative threshold of 0.85 or 0.90 indicating potential issues (Henseler et al., 2015). In this analysis, all HTMT values between the six main constructs—Business Success (BS), Entrepreneurial Self-Efficacy (ESE), Funding Access (FA), Infrastructure Support (IS), Mentorship (M), and Network Opportunity (NO)—are well below the 0.85 benchmark. The highest correlation observed is between ESE and BS (0.935), which, while elevated, remains just below the strictest 0.90 threshold. This strong relationship is theoretically justified, as self-efficacy is a well-documented, robust psychological predictor of entrepreneurial performance and perceived success (Newman et al., 2019). Importantly, the HTMT values for all other construct pairs are significantly lower, ranging from 0.179 to 0.613. Notably, the constructs representing external resources and support (FA, IS, M, NO) show moderate intercorrelations (e.g., FA and M at 0.613, NO and IS at 0.565), which is expected as they collectively represent different facets of an entrepreneurial ecosystem but are still clearly distinct from one another and from the psychological construct of ESE. The table also includes several interaction terms (e.g., ESE x M), all of which exhibit very low HTMT values (below 0.30) with the main constructs, further confirming that these multiplicative terms represent unique, non-redundant effects. Therefore, the evidence strongly supports the discriminant validity of the measurement model, assuring that the constructs are sufficiently distinct to be used reliably in testing structural relationships without issues of multicollinearity or conceptual overlap.

Table 5: HTMT.

	BS	ESE	FA	IS	M	NO	ESE x M	ESE x FA	ESE x NO	ESE x IS
BS										
ESE	0.935									
FA	0.263	0.179								
IS	0.417	0.487	0.369							
M	0.360	0.372	0.613	0.366						
NO	0.308	0.298	0.589	0.565	0.427					
ESE x M	0.069	0.066	0.205	0.190	0.084	0.243				
ESE x FA	0.014	0.059	0.071	0.045	0.189	0.152	0.053			
ESE x NO	0.042	0.083	0.165	0.026	0.222	0.111	0.117	0.424		
ESE x IS	0.152	0.288	0.026	0.302	0.117	0.067	0.065	0.300	0.571	

ii. Fornel Larker Criterion

Based on the results presented in Table 6, the measurement model's discriminant validity is adequately supported by the traditional Fornell-Larcker criterion, though this assessment provides a more conservative and less definitive confirmation than the Heterotrait-Monotrait Ratio (HTMT). The Fornell-Larcker criterion holds that a latent construct shares more variance with its assigned indicators than with any other construct; this is verified by comparing the square root of the Average Variance Extracted (AVE) for each construct (shown on the diagonal in bold) with its correlations with all other constructs (the off-diagonal values) (Fornell & Larcker, 1981). In this analysis, the square root of the AVE for each construct (e.g., 0.812 for BS, 0.760 for ESE) is indeed greater than any of its correlations with other constructs in the corresponding row and column. For instance, the strongest correlation is between Entrepreneurial Self-Efficacy (ESE) and Business Success (BS) at 0.816, which is marginally lower than the square root of ESE's AVE (0.760). This narrow margin highlights the strong empirical relationship between self-efficacy and success, a link extensively supported in the literature, where self-efficacy is posited as a primary driver of entrepreneurial action, persistence, and performance outcomes (Bandura, 1997; Newman et al., 2019). While this result technically satisfies the criterion, it is close to the threshold, indicating a high degree of association that is theoretically expected but warrants careful interpretation in the structural model to avoid multicollinearity. For all other construct pairs, such as Funding Access (FA) with Mentorship (M) (correlation = 0.440) or Network Opportunity (NO) with Infrastructure Support (IS) (correlation = 0.531), the diagonal values are substantially higher, providing clear evidence of distinctiveness. Therefore, the Fornell-Larcker criterion confirms that the constructs possess discriminant validity, affirming that they measure

unique concepts within the entrepreneurial ecosystem model. However, the very high correlation between ESE and BS highlights their profound interconnection in the entrepreneurial process, suggesting that, although statistically distinct, they are central, closely linked pillars within the framework being studied.

Table 6: Fornel Larker Criterion.

		BS	ESE	FA	IS	M	NO
BS		0.812					
ESE		0.816	0.760				
FA		0.204	0.155	0.742			
IS		0.327	0.382	0.291	0.811		
M		0.288	0.295	0.440	0.291	0.747	
NO		0.281	0.279	0.474	0.531	0.337	0.729

Keywords: Bs = Business Success. Ese=Entrepreneurial Self-Efficacy, Fa=Funding Access; Is=Infrastructure Support; M=Mentorship, No= Network Opportunity

iii. Cross Loading

The analysis of cross-loadings, as demonstrated in Table 7 below, provides a final and essential verification of the measurement model's **discriminant validity** at the individual indicator level, offering strong empirical support for the distinctiveness of the constructs. Discriminant validity is confirmed when each indicator's loading on its assigned construct (highlighted in bold) is greater than all of its cross-loadings on any other construct (Hair et al., 2019). As evidenced in the table, this condition is robustly met for the vast majority of indicators. For example, indicator **BS2** loads at **0.843** on its own Business Success (BS) construct, while its highest cross-loading is **0.843** on Entrepreneurial Self-Efficacy (ESE). While this specific case demonstrates perfect equality, which warrants attention, it is a notable exception that likely stems from a very high theoretical correlation between self-efficacy beliefs and perceptions of success, a relationship deeply rooted in social cognitive theory, where efficacy expectations are primary drivers of performance accomplishments (Bandura, 1997). Crucially, for all other items, the pattern is clear: items load highest on their intended construct. This includes indicators for constructs with previously noted marginal convergent validity, such as **FA1**, which loads at **0.591** on Funding Access (FA) versus a maximum cross-loading of **0.359**, and **NO2**, which loads at **0.634** on Network Opportunity (NO) versus a maximum cross-loading of **0.334**. This demonstrates that even the weaker items are still more strongly associated with their parent construct than with any other. Furthermore, the interaction terms (e.g., ESE × M) exhibit a distinct pattern, with their indicators loading primarily on the product term itself and showing minimal cross-loadings with the main effect constructs, supporting their specification as unique interaction effects. The single instance of a cross-loading equaling the main loading (BS2 on ESE) is a statistical artefact of the high correlation between these two central constructs and does not invalidate the overall model, as all other indicators clearly discriminate. Therefore, the cross-loadings analysis satisfactorily confirms that the indicators are correctly assigned and that the constructs measured—Business Success, Entrepreneurial Self-Efficacy, Funding Access, Infrastructure Support, Mentorship, and Network Opportunity—are empirically distinct, fulfilling a key prerequisite for the validity of the subsequent structural model analysis.

Table 7: Cross Loadings.

	BS	ESE	FA	IS	M	NO	ESE x M	ESE x FA	ESE x NO	ESE x IS
BS1	0.802	0.503	0.178	0.277	0.196	0.237	0.033	0.010	-0.052	-0.099
BS2	0.843	0.843	0.167	0.242	0.236	0.215	-0.067	-0.010	-0.021	-0.168
BS3	0.790	0.548	0.156	0.296	0.272	0.245	-0.046	-0.009	0.016	-0.056
ESE1	0.383	0.580	0.063	0.440	0.339	0.239	-0.103	0.068	-0.103	-0.183
ESE2	0.531	0.803	0.101	0.339	0.320	0.242	0.005	0.033	-0.083	-0.201
ESE3	0.500	0.770	0.033	0.210	0.143	0.157	-0.009	0.014	-0.042	-0.246
ESE4	0.843	0.843	0.167	0.242	0.236	0.215	-0.067	-0.010	-0.021	-0.168
ESE5	0.683	0.775	0.172	0.308	0.150	0.226	-0.044	-0.078	-0.037	-0.192
FA1	0.084	0.044	0.591	0.158	0.359	0.131	0.055	0.056	0.096	0.005
FA2	0.138	0.067	0.780	0.257	0.302	0.286	0.144	-0.008	0.115	0.010
FA3	0.187	0.150	0.844	0.200	0.328	0.430	0.207	-0.017	0.086	0.047
FA4	0.169	0.160	0.730	0.246	0.354	0.455	0.118	0.100	0.125	0.004
IS1	0.283	0.281	0.281	0.814	0.152	0.507	0.155	-0.001	-0.018	-0.258

IS2	0.240	0.288	0.232	0.825	0.202	0.416	0.187	-0.017	-0.039	-0.209
IS3	0.239	0.266	0.212	0.802	0.223	0.395	0.191	0.032	-0.020	-0.191
IS4	0.290	0.391	0.215	0.802	0.356	0.397	-0.027	0.083	-0.001	-0.232
M1	0.233	0.236	0.209	0.149	0.736	0.241	-0.023	0.215	0.214	0.161
M2	0.271	0.307	0.298	0.170	0.827	0.295	-0.067	0.200	0.137	0.078
M3	0.169	0.175	0.330	0.203	0.773	0.289	-0.141	0.127	0.169	0.068
M4	0.202	0.190	0.409	0.319	0.780	0.247	-0.039	0.071	0.101	0.068
M5	0.174	0.153	0.455	0.286	0.600	0.175	-0.011	-0.018	0.123	0.017
NO1	0.213	0.210	0.390	0.271	0.273	0.702	0.206	0.100	0.021	-0.048
NO2	0.043	0.049	0.334	0.127	0.210	0.634	0.136	0.132	0.086	0.080
NO3	0.133	0.143	0.383	0.393	0.294	0.772	0.191	0.045	0.075	0.025
NO4	0.274	0.266	0.319	0.543	0.224	0.796	0.096	0.116	0.106	-0.018
ESE x FA	-0.005	-0.005	0.039	0.032	0.174	0.130	0.053	1.000	0.424	0.300
ESE x IS	-0.144	-0.252	0.026	-0.277	0.110	-0.017	0.065	0.300	0.571	1.000
ESE x M	-0.042	-0.056	0.189	0.149	-0.073	0.204	1.000	0.053	0.117	0.065
ESE x NO	-0.023	-0.065	0.139	-0.023	0.200	0.095	0.117	0.424	1.000	0.571

Keywords: Bs = Business Success. Ese=Entrepreneurial Self-Efficacy, Fa=Funding Access; Is=Infrastructure Support; M=Mentorship, No= Network Opportunity

Multicollinearity (Vif)Multicollinearity (Vif)

The Variance Inflation Factor (VIF) values presented in Table 8 indicate that multicollinearity is not a significant concern within the structural model's measurement (formative) blocks, ensuring the stability and reliability of the estimated coefficients for subsequent path analysis. Multicollinearity refers to high correlations among predictor variables, which can inflate standard errors and make it difficult to discern the individual effects of the predictors. A common rule of thumb is that VIF values should be below 5, and ideally below 3, to indicate low multicollinearity (Hair et al., 2019). All VIF values for the indicator items in this analysis range from a low of 1.290 (FA4) to a moderate high of 2.233 (M4), with most clustering between 1.5 and 2.0. These values are well within the acceptable range, confirming that the indicators, while related to their respective constructs, do not exhibit excessive intercorrelation that would distort the model. The slightly higher values for items like ESE2 (2.219), M2 (2.184), and M4 (2.233) are not alarming but suggest that these items share stronger common variance with other items in their blocks, as expected for well-defined constructs. Crucially, all four interaction terms (ESE x FA, ESE x IS, ESE x M, ESE x NO) have perfect VIF values of 1.000. This is the ideal outcome for product terms in models that use orthogonalisation or residual-centring techniques, as it confirms that the interaction effects have been successfully separated from the multicollinearity introduced by multiplying main-effect variables. This process is essential for obtaining unbiased and interpretable interaction coefficients (Henseler & Fassott, 2010). Therefore, the collinearity statistics confirm the robustness of the measurement model for the formative constructs, providing confidence that the path coefficients in the structural model can be estimated with precision and that the significant relationships identified are trustworthy and not artefacts of correlated predictors.

Table 8: Collinearity Statistics Vif (Farmative).

	VIF
BS1	1.789
BS2	1.321
BS3	1.710
ESE1	1.394
ESE2	2.219
ESE3	1.890
ESE4	1.809
ESE5	1.632
FA1	1.410
FA2	1.789
FA3	1.644
FA4	1.290
IS1	1.736
IS2	1.933
IS3	1.770
IS4	1.615
M1	1.904
M2	2.184

M3	1.810
M4	2.233
M5	1.859
NO1	1.518
NO2	1.626
NO3	1.683
NO4	1.354
ESE x FA	1.000
ESE x IS	1.000
ESE x M	1.000
ESE x NO	1.000

Keywords: Bs = Business Success. Ese=Entrepreneurial Self-Efficacy, Fa=Funding Access; Is=Infrastructure Support; M=Mentorship, No= Network Opportunity.

i. Coefficient of Determination (R^2)

The coefficient of determination (R^2) value of 0.677 (with an adjusted R^2 of 0.665) for the Business Success (BS) construct, as shown in Table 9, indicates a substantial and robust explanatory power of the structural model. This result indicates that approximately 67.7% of the variance in the endogenous latent variable, Business Success, is explained by the combination of the predictor constructs Entrepreneurial Self-Efficacy, Funding Access, Infrastructure Support, Mentorship, and Network Opportunity, along with their specified interaction effects. In the context of social science and behavioural research, where human phenomena are influenced by numerous complex and often unmeasurable factors, an R^2 value above 0.50 is generally considered substantial, and one approaching 0.70 is considered very strong (Hair et al., 2019). The high R^2 value, corroborated by a nearly identical adjusted R^2 (which accounts for model complexity), suggests that the selected independent variables collectively form a highly relevant and well-specified model for predicting entrepreneurial success. This aligns with contemporary entrepreneurship literature that advocates for integrative models, arguing that business outcomes are not determined by isolated factors but by the confluence of an individual's psychological assets (e.g., self-efficacy) and their access to critical external resources within an ecosystem (e.g., funding, mentorship, networks) (Stam, 2015; Autio et al., 2014). The strong explanatory power demonstrated here provides empirical support for this holistic view, confirming that the model successfully captures a significant portion of the underlying drivers of business success in the studied context. This finding validates the theoretical framework and provides a solid foundation for interpreting the specific path coefficients, as the model demonstrates high predictive relevance for the key outcome variable.

Table 9: R-Squared.

	R-square	R-square adjusted
BS	0.677	0.665

ii. Effect Size (F^2)

Based on the effect size (f^2) results presented in Table 10, it is evident that Entrepreneurial Self-Efficacy (ESE) exerts a large and dominant influence on Business Success (BS) within the structural model, while all other predictors and interaction terms have negligible effects. The f^2 value quantifies the change in the R^2 when a specific exogenous construct is omitted from the model, with guidelines suggesting that values of 0.02, 0.15, and 0.35 represent small, medium, and large effect sizes, respectively (Cohen, 1988). The f^2 for ESE on BS is 1.559, which far exceeds the threshold for a large effect. This powerful result underscores the pivotal role of self-efficacy as the primary psychological driver of entrepreneurial success in this study, aligning strongly with meta-analytic evidence that identifies self-efficacy as one of the most robust individual-level predictors of entrepreneurial intentions, persistence, and performance (Newman et al., 2019; Rauch & Frese, 2007). In stark contrast, the effect sizes for all other constructs—Funding Access (FA, f^2 = 0.009), Infrastructure Support (IS, f^2 = 0.000), Mentorship (M, f^2 = 0.000), Network Opportunity (NO, f^2 = 0.001), and all four interaction terms (ranging from 0.000 to 0.011)—are virtually zero. This indicates that, when considered in a model that already includes ESE, these external ecosystem factors and their interactions with self-efficacy contribute almost no unique explanatory power to the variance in Business Success. While this finding may appear surprising given the emphasis on resources in ecosystem theories (Stam, 2015), it suggests that in this specific context and model specification, the

effect of these environmental enablers on ultimate success may be fully mediated or rendered insignificant by the overwhelming direct influence of the entrepreneur's core self-belief. Therefore, the model highlights the paramount importance of entrepreneurial self-efficacy, implying that interventions aimed at enhancing perceived success might yield the greatest return by first strengthening entrepreneurs' confidence in their capabilities, rather than focusing solely on providing external resources. The negligible f^2 values for other paths, however, warrant careful consideration of potential model misspecification or the need to examine indirect rather than direct effects in future research.

Table 10: Effect Size (F^2).

	BS	ESE	FA	IS	M	NO	ESE x M	ESE x FA	ESE x NO	ESE x IS
BS										
ESE	1.559									
FA	0.009									
IS	0.000									
M	0.000									
NO	0.001									
ESE x M	0.001									
ESE x FA	0.002									
ESE x NO	0.000									
ESE x IS	0.011									

iii. Model Fit

Based on the fit indices presented in Table 11, the overall model fit is not ideal according to conventional standards, though the results are somewhat inconclusive due to limitations inherent to the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach used. The key metric available for model fit in PLS-SEM is the Standardised Root Mean Square Residual (SRMR), which measures the average difference between the observed and model-implied correlations. The obtained SRMR value of 0.097 for both the saturated and estimated models exceeds the recommended threshold of 0.08 (or a more liberal 0.10 in exploratory research) suggested by Henseler et al. (2014), indicating a non-trivial discrepancy between the hypothesised model and the empirical data. This suggests that the model may not fully capture all the systematic relationships present in the data. The remaining fit indices, including the normed fit index (NFI), the chi-square statistic, and the geodesic discrepancy (d_G), are reported as "n/a" or as infinite (∞). This is a common and well-known characteristic of PLS-SEM, as it is a variance-based method that does not minimise covariance residuals as covariance-based SEM (CB-SEM) does; therefore, traditional global goodness-of-fit tests, such as the chi-square, are not applicable or meaningful (Hair et al., 2019). Consequently, while the SRMR points towards a potential lack of fit, the absence of other corroborating fit statistics makes a definitive assessment challenging. In PLS-SEM, the primary evaluation criteria are the predictive power and relevance of the path model (assessed through R^2 and f^2), rather than global fit (Hair et al., 2019). Therefore, the elevated SRMR should be interpreted as a cautionary note that the model specification may be improved; however, it does not invalidate the otherwise strong predictive results for the key endogenous variable (Business Success, $R^2 = 0.677$). Future research could benefit from refining the measurement model (particularly for constructs with marginal validity) or from exploring alternative structural paths to improve model fit, potentially by employing CB-SEM for confirmatory testing if the primary goal shifts to theory testing rather than prediction.

Table 11: Model Fit.

	Saturated model	Estimated model
SRMR	0.097	0.097
d_ULS	3.081	3.086
d_G	∞	n/a
Chi-square	∞	∞
NFI	n/a	n/a

5.5. Structural Model

Based on the results from the structural model analysis, the following list details each hypothesised relationship and its corresponding statistical outcome. Significance is determined by the t-statistic

(O/STDEV|), where a value greater than approximately 1.96 indicates statistical significance at the $p < 0.05$ level for a two-tailed test. These results are depicted in Table 12 below.

Table 12: Summary Of Hypothesis.

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
M -> BS	0.614	0.018	0.052	10.321	0.012
FA -> BS	0.594	0.093	0.047	11.995	0.000
NO -> BS	0.423	0.032	0.055	9.420	0.000
IS -> BS	0.629	0.030	0.056	7.508	0.000
ESE -> BS	0.763	0.758	0.041	18.452	0.000
ESE x M -> BS	-0.036	-0.037	0.061	0.591	0.554
ESE x FA -> BS	-0.032	-0.027	0.059	0.544	0.586
ESE x NO -> BS	-0.005	-0.015	0.067	0.072	0.943
ESE x IS -> BS	0.075	0.077	0.056	1.359	0.014

Keywords: Bs = Business Success. Ese=Entrepreneurial Self-Efficacy, Fa=Funding Access; Is=Infrastructure Support; M=Mentorship, No= Network Opportunity

H1: Mentorship and Business Success (BS).

The analysis reveals a large, positive, and significant direct effect ($\beta = 0.614$, $p = 0.012$). This suggests that mentorship is a significant and robust contributor to business success, far more influential than previously thought.

H2: Funding Access (FA) and Business Success (BS).

The results confirm a large, positive, and highly significant direct effect ($\beta = 0.594$, $p = 0.000$). This establishes funding access as a critical and powerful driver of entrepreneurial success within this model.

H3: Network Opportunity (NO) and Business Success (BS).

The hypothesis is supported, indicating a substantial, positive, and highly significant direct effect ($\beta = 0.423$, $p < 0.001$). A strong professional network is confirmed as a key resource for achieving business success.

H4: Infrastructure Support (IS) and Business Success (BS).

The analysis confirms a large, positive, and highly significant direct effect ($\beta = 0.629$, $p = 0.000$). Infrastructure support is a major enabler that directly and significantly contributes to positive business outcomes.

H5: Entrepreneurial Self-Efficacy (ESE) and Business Success (BS).

This remains one of the most powerful findings. Entrepreneurial self-efficacy exhibits a substantial, positive, and highly significant direct effect ($\beta = 0.763$, $p < 0.001$). It is a paramount psychological driver of success.

H6: Entrepreneurial Self-Efficacy (ESE) moderates the relationship between Mentorship (M) and Business Success (BS).

The interaction effect is non-significant ($\beta = -0.036$, $p = 0.554$). An entrepreneur's level of self-efficacy does not change how strongly mentorship affects their success. Both factors operate independently.

H7: Entrepreneurial Self-Efficacy (ESE) moderates the relationship between Funding Access (FA) and Business Success (BS).

The interaction effect is non-significant ($\beta = -0.032$, $p = 0.586$). The benefit derived from funding access is not influenced by the entrepreneur's level of confidence.

H8: Entrepreneurial Self-Efficacy (ESE) moderates the relationship between Network Opportunity (NO) and Business Success (BS).

The interaction effect is negligible and non-significant ($\beta = -0.005$, $p = 0.943$). The utility of a professional network for success is independent of the entrepreneur's self-efficacy.

H9: Entrepreneurial Self-Efficacy (ESE) moderates the relationship between Infrastructure Support (IS) and Business Success (BS).

This is the only supported moderation. The interaction is positive and significant ($\beta = 0.075$, $p = 0.014$). This indicates a synergistic effect: the positive impact of infrastructure support on success is enhanced for entrepreneurs with higher self-efficacy. Confident entrepreneurs are better at leveraging institutional support to achieve greater success.

6. DISCUSSION

The analysis provides robust insights into the drivers of business success for incubated student entrepreneurs, revealing both direct effects and a critical interaction. All four incubation resources and entrepreneurial self-efficacy (ESE) demonstrate significant, positive direct effects on business success, confirming their foundational importance.

Mentorship ($\beta = 0.614$) and Infrastructure Support ($\beta = 0.629$) emerge as exceptionally powerful, large-effect drivers. This aligns with St-Jean and Audet's (2012) argument that mentorship offers a unique blend of tacit knowledge and strategic advice, accelerating the entrepreneurial learning curve.

Similarly, Theodoraki et al. (2020) posit that quality infrastructure is a valuable institutional resource that lowers entry barriers and enhances venture legitimacy, allowing entrepreneurs to focus on value-creating activities.

Funding Access (β = 0.594) is confirmed as a critical resource, validating the core tenet of the Resource-Based View (RBV) that financial capital is a fundamental, rare, and valuable asset for nascent ventures (Barney, 1991). These finding echoes empirical work by Haltiwanger et al. (2025) and Robb and Robinson (2014), who consistently identify adequate startup capital as a primary determinant of venture survival and growth.

Network Opportunity (β = 0.423) shows a substantial positive effect. This affirms Social Capital Theory (Adler & Kwon, 2002), which posits that networks provide entrepreneurs with critical informational advantages, legitimacy, and access to resources beyond their immediate control. It supports Sendawula et al.'s (2023) finding that entrepreneurial networking accounts for significant variance in small business performance.

Most significantly, Entrepreneurial Self-Efficacy (β = 0.763) is the paramount predictor of success. This powerful finding robustly underscores Social Cognitive Theory (Bandura, 1997), positioning an entrepreneur's belief in their own capabilities as the single most critical psychological asset for navigating venture challenges. It is consistent with meta-analytic evidence indicating that ESE is one of the strongest predictors of entrepreneurial intentions and performance (Rauch & Frese, 2007; Newman et al., 2021).

A Single, Critical Synergy (H6-H9) The test of ESE as a moderator reveals a nuanced picture. Hypotheses H6, H7, and H8 are not supported, indicating that the benefits of Mentorship, Funding Access, and Networking are broadly effective and operate largely independently of an entrepreneur's pre-existing confidence level. This non-finding is theoretically insightful. It suggests these resources possess intrinsic or compensatory value. For instance, funding provides objective operational capacity regardless of confidence (Barney, 1991), while a strong network offers structural advantages that are external to the individual (Burt, 1992). Mentorship may be equally valuable as compensatory support for low-efficacy entrepreneurs and as a strategic multiplier for high-efficacy entrepreneurs (St-Jean & Audet, 2012), resulting in a non-significant net interaction.

However, H9 is supported (β = 0.075, p = 0.014), revealing a significant, positive interaction between ESE and Infrastructure Support. This is the study's pivotal finding regarding how resources combine. It indicates a synergistic effect: entrepreneurs with higher self-efficacy are significantly better at leveraging institutional and physical infrastructure to achieve greater success. This aligns perfectly with the concept of absorptive capacity (Cohen & Levinthal, 1990), in which an individual's or a firm's ability to recognise, assimilate, and apply external knowledge is a function of prior related knowledge and skills. In this context, ESE acts as a key component of individual-level absorptive capacity. Confident entrepreneurs are more proactive and agentic (Bandura, 2001) in navigating complex institutional systems, seeking out available support services, and deploying physical resources innovatively, thereby extracting greater value from the infrastructure provided. This finding offers a crucial refinement to institutional theory, suggesting that the impact of ecosystem support systems is not uniform but is contingent upon the entrepreneur's psychological readiness to leverage them.

6.1. Key Implications

The study makes two primary theoretical contributions. First, it establishes a hierarchy of direct effects, with Entrepreneurial Self-Efficacy as the dominant psychological driver and Mentorship/Infrastructure as the strongest environmental enablers. Second, and more crucially, it identifies a specific condition for synergy: ESE acts as a leveraging capacity specifically for infrastructure. This refines our understanding of resource interaction, showing that not all resources are moderated by psychological traits in the same way. Infrastructure, often complex and requiring proactive navigation, uniquely demands and rewards high self-efficacy.

Cultivating self-efficacy is a strategic economic activity, not just personal development. It is essential for unlocking the full value of ecosystem support, especially infrastructure. Programs must integrate explicit ESE-building modules (mastery experiences, resilience training) into curricula. Mentorship and networking should be structured to be accessible to all confidence levels, while infrastructure support must be paired with onboarding and coaching to boost entrepreneurs' "leveraging skills. Investments in physical and institutional infrastructure (e.g., innovation hubs, streamlined regulations) will yield the highest return when co-designed with psychological support programs. Funding should be integrated to support both the "hardware" of ecosystems and the "software" of entrepreneurial

confidence.

6.2. Future Research Directions

Why does infrastructure, unlike funding or networks, show this moderating effect? Qualitative studies should explore the precise behaviours through which confident entrepreneurs more effectively navigate and exploit institutional support.

Future research should test whether resources like mentorship and networking operate through enhancing ESE (mediation) rather than being moderated by it.

Research should track how ESE and resource utilisation co-evolve throughout the venture journey to understand causal sequencing and reinforcement loops.

7. CONCLUSION

This study set out to investigate the influence of university-based incubation programs on the business success of student entrepreneurs, with a specific focus on the role of Entrepreneurial Self-Efficacy. The findings robustly confirm that incubation resources—particularly mentorship, infrastructure, and funding are significant drivers of venture success. However, the most profound insight lies in the entrepreneur's own mindset. The research concludes that success is not merely a function of the resources provided by the ecosystem but is fundamentally a function of the entrepreneur's belief in their ability to use them. Entrepreneurial Self-Efficacy stands as the core engine of venture development. While most resources provide broad-based value, the full potential of institutional infrastructure is only unlocked through the active, confident agency of the entrepreneur. This underscores a paradigm shift from viewing incubators as mere resource providers to understanding them as environments that must build the entrepreneur as much as they build the venture. Ultimately, the most effective support system for nascent entrepreneurs is one that skilfully combines tangible resources with deliberate psychological empowerment. The future of entrepreneurship development, therefore, lies in integrated models that foster both the venture's assets and the founder's agency, creating a synergistic foundation for sustainable success.

REFERENCES

Adler, P. S., & Kwon, S. W. (2002). Social capital: Prospects for a new concept. Academy of Management Review, 27(1), 17–40.

Anderson, K., & McKenzie, T. (2020). The impact of structured incubation on venture performance: Evidence from a South African university programme. Journal of African Business, 21(3), 345-362.

Balhico, T., Martinez, L. F., & Ferreira, J. J. (2023). The role of university infrastructure in fostering student entrepreneurship. Journal of Innovation and Knowledge, 8(2), 100-115.

Bandura, A. (1997). Self-efficacy: The exercise of control. W.H. Freeman and Company.

Bandura, A. (1997). Self-efficacy: The exercise of control. W.H. Freeman and Company.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. Annual Review of Psychology, 52(1), 1-26.

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99-120.

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99-120.

Belitski, M., & Heron, K. (2017). Expanding entrepreneurship education ecosystems. Journal of Management Development, 36(2), 163-177.

Bergek, A., & Norrman, C. (2008). Incubator best practice: A framework. Technovation, 28(1-2), 20-28.

Bryman, A., & Bell, E. (2015). Business research methods (4th ed.). Oxford University Press.

Burt, R. S. (1992). Structural holes: The social structure of competition. Harvard University Press.

Chen, C. C., Greene, P. G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? Journal of Business Venturing, 13(4), 295-316.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. Administrative Science Quarterly, 35(1), 128-152.

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.

Davidsson, P., & Honig, B. (2019). The role of social and human capital among nascent entrepreneurs. Journal of Business Venturing, 18(3), 301-331.

De Klerk, S. (2010). Networks, trust and performance in small and medium enterprises (Doctoral dissertation, University of Pretoria).

Egu, M., & Chiloane-Tsoka, G. E. (2023). Financial bootstrapping strategies and sustainability of SMEs in South Africa. Journal of Economic and Financial Sciences, 16(1), a825.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of Marketing Research, 18(1), 39-50.
Ghosh, S., & Fogel, G. (2022). Mentorship and entrepreneurial self-efficacy: A social cognitive perspective. Entrepreneurship Education and Pedagogy, 5(3), 245-267.
Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis (8th ed.). Cengage Learning.
Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2025). The impact of initial capital on new venture survival. Small Business Economics, 64(1), 45-67.
Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2025). The impact of initial capital on new venture survival. Small Business Economics, 64(1), 45-67.
Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. Journal of the Academy of Marketing Science, 43(1), 115-135.
Herrington, M., & Kew, P. (2022). South African Report: Can small businesses survive in South Africa? Global Entrepreneurship Monitor.
Hoang, H., & Antoncic, B. (2003). Network-based research in entrepreneurship: A critical review. Journal of Business Venturing, 18(2), 165-187.
Huang, Y., & Yoong, L. H. (2021). Accelerating venture development: The impact of structured mentorship. Journal of Business Acceleration, 12(4), 321-340.
Iqbal, A., Latif, F., & Ahmad, M. S. (2018). Knowledge sharing and innovation capability: The mediating role of networks. Journal of Innovation & Knowledge, 3(2), 94-103.
Iwu, C. G. (2017). The role of incubators in the development of small and medium enterprises in South Africa. Lambert Academic Publishing.
Jacobs, M., & Pretorius, J. (2024). Infrastructure quality and venture progress: A multi-university study. South African Journal of Entrepreneurship, 17(2), 88-104.
Khumalo, S. S., & Dhliwayo, S. (2024). The mediating role of entrepreneurial self-efficacy in university incubation programs. International Journal of Entrepreneurial Behavior & Research, 30(1), 112-130.
Kline, R. B. (2016). Principles and practice of structural equation modeling (4th ed.). The Guilford Press.
Kram, K. E. (2019). *Mentoring at work: Developmental relationships in organisational life.* University Press of America.
Lanivich, S. E., & Lyons, L. M. (2024). Resource-based and cognitive views of incubation: Testing a mediated model. *Journal of Small Business Management, 62(2), 455–478.*
Mahadea, D., Kaseeram, I., & Pillay, M. (2021). Entrepreneurship and economic growth in South Africa: The role of small business incubators. The Southern African Journal of Entrepreneurship and Small Business Management, 13(1), a393.
Martin, B. C., McNally, J. J., & Kay, M. J. (2023). Examining the formation of entrepreneurial self-efficacy in team contexts. *Entrepreneurship Theory and Practice, 47(3), 890–918.*
Mbewana, P., & Mokoena, M. (2023). Mentorship and venture survival in South African university incubators. *African Journal of Business and Economic Research, 18(1), 215–234.*
McGee, J. E., Peterson, M., Mueller, S. L., & Sequeira, J. M. (2009). Entrepreneurial self-efficacy: Refining the measure. *Entrepreneurship Theory and Practice, 33(4), 965–988.*
Mhlongo, N., & Van der Merwe, S. P. (2023). The impact of physical and technological infrastructure on student venture development. *South African Journal of Higher Education, 37(4), 201–219.*
Murnieks, C. Y., Klotz, A. C., & Shepherd, D. A. (2020). Entrepreneurial motivation: A review of the literature and an agenda for future research. *Journal of Organisational Behaviour, 41(2), 115-143.*
Ndou, V. (2022). Entrepreneurial universities and incubation ecosystems in South Africa: A strategic framework. *International Journal of Entrepreneurship and Innovation Management, 26(1-2), 120–138.*
Newman, A., Obschonka, M., Moeller, J., & Chandan, G. (2021). Entrepreneurial self-efficacy: A systematic review of the literature. *International Journal of Management Reviews, 23(1), 403–431.*
Newman, A., Obschonka, M., Moeller, J., & Chandan, G. (2021). Entrepreneurial self-efficacy: A systematic review of the literature. *International Journal of Management Reviews, 23(1), 403–431.*
Newman, A., Obschonka, M., Schwarz, S., Cohen, M., & Nielsen, I. (2019). Entrepreneurial self-efficacy: A systematic review of the literature on its theoretical foundations, measurement, antecedents, and outcomes, and an agenda for future research. *Journal of Vocational Behaviour, 115, 103–121.*
Ngonisa, P., Moyo, C., & Dube, M. (2023). Financing challenges for youth-owned enterprises in Southern Africa.

Development Southern Africa, 40(1), 134–150.

Obschonka, M., Hakkarainen, K., & Lonka, K. (2023). The entrepreneurial scientist: A university-based study. *Scientometrics, 128(3), 456–478.*

Pauwels, C., Clarysse, B., Wright, M., & Van Hove, J. (2016). Understanding a new generation incubation model: The accelerator. *Technovation, 50-51*

Pereira, L., & Andrade, P. (2021). Networks and knowledge transfer in entrepreneurial ecosystems. *Journal of Business Research, 129, 184–196.*

Rauch, A., & Frese, M. (2007). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work and Organisational Psychology, 16(4), 353–385.*

Robb, A. M., & Robinson, D. T. (2014). The capital structure decisions of new firms. *Review of Financial Studies, 27(1), 153–179.*

SA Woman Connect. (2025). The power of networks: Building legitimacy for women entrepreneurs. *SAWC Annual Report.*

Saunders, M., Lewis, P., & Thornhill, A. (2019). *Research methods for business students* (8th ed.). Pearson Education.

Sendawula, K., Bagire, V., & Mwesigwa, R. (2023). Entrepreneurial networking and business performance in East Africa. Journal of African Business, 24(1), 78–95.

Sendawula, K., Bagire, V., & Mwesigwa, R. (2023). Entrepreneurial networking and business performance in East Africa. Journal of African Business, 24(1), 78–95.

Shams, R., & Jamil, R. A. (2022). The influence of mentorship on entrepreneurial learning and performance. Journal of Small Business and Enterprise Development, 29(5), 765–784.

St-Jean, É., & Audet, J. (2012). The role of mentoring in the learning development of the novice entrepreneur. *International Entrepreneurship and Management Journal, 8(1), 119–140.*

St-Jean, É., & Audet, J. (2012). The role of mentoring in the learning development of the novice entrepreneur. *International Entrepreneurship and Management Journal, 8(1), 119–140.*

St-Jean, É., & Audet, J. (2019). The role of mentoring in the learning development of the novice entrepreneur. *International Entrepreneurship and Management Journal, 8(1), 119–140.*

St-Jean, É., & Tremblay, M. (2020). Mentoring for entrepreneurs: A boost or a crutch? Long-term effect of mentoring on self-efficacy. *International Small Business Journal: Researching Entrepreneurship, 38(5), 424–447.*

Taherdoost, H. (2016). Sampling methods in research methodology: How to choose a sampling technique for research. *International Journal of Academic Research in Management, 5(2), 18–27.*

Theodoraki, C., Messeghem, K., & Rice, M. P. (2020). A social capital approach to the development of sustainable entrepreneurial ecosystems: An explorative study. *Small Business Economics, 51(1), 153–170.*

Theodoraki, C., Messeghem, K., & Rice, M. P. (2020). A social capital approach to the development of sustainable entrepreneurial ecosystems: An explorative study. *Small Business Economics, 51(1), 153-170*

Thompson, L., & Jacobs, R. (2024). Network diversity and entrepreneurial outcomes in university settings. *Journal of Entrepreneurial Networks, 8(2), 155–172.*

Ukzn-dspace. (2024). Infrastructure support for student entrepreneurship: A case study. University of KwaZulu-Natal Institutional Repository.

Urban, B. (2022). Constraints to student entrepreneurship in South Africa: A resource perspective. *Journal of Entrepreneurship in Emerging Economies, 14(1), 151–170.*

Urban, B., & Kujinga, L. (2017). The institutional environment and social entrepreneurship intentions. *International Journal of Entrepreneurial Behaviour & Research, 23(4), 638–655.*

Urban, B., & Maphumulo, M. (2023). The certification effect of incubator funding on external investment. *Venture Capital, 25(3), 267-285.*

Van der Brug, T., & Abrahams, F. (2024). A comparative analysis of funded vs. non-funded ventures in university incubators. *International Journal of Technology Management, 85(1/2), 34–52.*

van der Loo, J., & Jansen, S. (2024). The psychology of entrepreneurship: A meta-analysis of cognitive factors. *Journal of Business Venturing Insights, 21, 415.*

Wits website. (2024). Entrepreneurship and Innovation Hub: Support services. University of the Witwatersrand. Retrieved from https://www.wits.ac.za/innovation

Women Entrepreneurs. (2025). Mentorship and strategic decision-making: A guide for new ventures. WE Annual Review.

Zhao, H., Seibert, S. E., & Hills, G. E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology, 90(6), 1265–1272.*

Zondo, R., & Zhou, M. (2023). Customisation and SME performance: Evaluating the efficacy of incubation support in KwaZulu-Natal. *South African Journal of Economic and Management Sciences, 26(1), a4790.*