



**STUDENT SELF-EMPLOYMENT IN SOUTH AFRICA:
A TRIPLE-HELIX-MODEL, ENTREPRENEURIAL COMPETENCE
AND SOCIAL SUPPORT PERSPECTIVE**

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DECLARATION

I, **Reabetswe Gladys Parkies**, declare that the thesis that I herewith submit for the doctoral degree *Doctor of Philosophy in Business Management* at the University of the Free State, is my independent work, and that I have not previously submitted it for a qualification at another institution of higher education.



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DEDICATION

This study is dedicated to my parents
Edward Mokoko and Nomvuyo Rosemary Parkies.



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ABSTRACT

Getting graduates employed has become a daunting task for most parts of the world. This reality has made progressive economies use student self-employment as a strategy to fight unemployment. South Africa has struggled to capitalise on student self-employment due to a lower supportive environment for entrepreneurship. Consequently, this has drawn interest in understanding the role of the triple helix model and social support towards student self-employment. It is against this backdrop that the current study aimed to develop a multi-tiered student self-employment ecosystem model through evaluating student perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment; measuring the effect of university initiatives on student self-employment; measuring the effect of social support on entrepreneurial competence; establishing the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment; and investigating the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa. A positivist research paradigm was applied through the use of a quantitative descriptive research methodology. Data were collected through a questionnaire from a convenience sample of 375 self-employed South African university students. SmartPLS 4 was used to analyse data through descriptive analysis, structural equation modelling, mediation and moderation analyses. The study concluded that students had low perceptions of university initiatives, industry support, and government support, while they had moderate perceptions of entrepreneurial competence and social support towards student self-employment; university initiatives did not have a statistically significant effect on student self-employment in the presence of mediators (entrepreneurial competence, industry support and government support); social support had a statistically significant positive effect on entrepreneurial competence; entrepreneurial competence (interpersonal generic competence), industry support and government fully mediates the relationship between university initiatives and student self-employment; and social support did not have a statistically significant moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa. This has major implications for theory and practice leading to the development of the student self-employment ecosystem model.

Keywords: *Triple helix model, Entrepreneurial competence, Social support, Student self-employment.*

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ABBREVIATIONS AND ACRONYMS

AVE	Average variance extracted
B-BBEE	Broad-Based Black Economic Empowerment
CA	Cronbach's alpha
COID	Compensation for Occupational Injuries and Diseases
CIPC	Companies and Intellectual Property Commission
CR	Composite reliability
DHET	Department of Higher Education and Training
EDHE	Entrepreneurship Development in Higher Education
FL	Factor loadings
GEM	Global Entrepreneurship Monitor
HTMT	Heterotrait-monotrait
ILO	International Labour Organization
KSA	Kingdom of Saudi Arabia
MSME	Micro small and medium enterprises
NBEAC	National Business Education Accreditation Council
NBSSI	National Board for Small-Scale Industries
OECD	Organisation for Economic Co-operation and Development
PLS-SEM	Partial least squares structural equation modelling
RC	Reliability coefficients
SDG	Sustainable development goal
SEM	Structural equation modelling
SMEs	Small and medium enterprises
Stats SA	Statistics South Africa
TVET	Vocational education and training
UAE	United Arab Emirates
USAf	Universities South Africa
VAT	Value-added tax
VIF	Variance inflation factor

Chapter 1

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1 Chapter overview

This chapter presents the overall introduction and background of this study. Therefore, the chapter is organised to present the introduction, background, preliminary literature review, problem statement, research objectives, research questions, and theoretical framework. Also, the chapter presents the hypotheses development, conceptual framework, summary of the methodology, chapter outline and definition of terms. The introduction is presented in the next section.

1.2 Introduction

Getting graduates employed has become a daunting task for most parts of the world (Ayalew and Zeleke, 2018). As a result of this reality, progressive economies have turned to student self-employment as a strategy to fight unemployment (Ayalew and Zeleke, 2018; Jena, 2020). Self-employment is synonymous with entrepreneurship pointing to the creation of jobs, a rise in income and an improved standard of living (Osmani, Weerakkody, Hindi and Eldabi, 2019; Wadho, Goedhuys and Chaudhry, 2019; Mgaiwa, 2021; Wakefield, Yu and Swanepoel, 2022). However, despite evidence indicating that self-employment can be a strategy for economic prosperity, South Africa has continued to suffer from high unemployment (Statistics South Africa [Stats SA], 2022). Stats SA (2023) pronounced that the national unemployment rate was 32,9 per cent in the first quarter of 2023. Graduate youth unemployment was at 59,6 per cent in the age group 15 to 24 years, and 40,5 per cent in the age group 25 to 34 years in the same period (Stats SA, 2022). Reports indicate that over the past four years there was a continuous increase in unemployment. where in 2019 it stood at 28,4 per cent, in 2020 at 29,2 per cent, in 2021 at 33,5 per cent and in 2022 at 32,7 per cent (Stats SA, 2022); Businesstech, 2022; Macrotrends, 2023). High unemployment leads to socio-economic problems that include reduced household income, low standard of living, poverty and crime (Osmani et al., 2019; Wakefield et al., 2022). High unemployment in South Africa is attributed to a lower supportive environment for entrepreneurship, as the Global Entrepreneurship Monitor (GEM, 2023) pointed out. South Africa is ranked 45 out of 50 countries in the GEM National Entrepreneurial Context Index (2023), a measure of the favourability of the environment for entrepreneurship and new business creation. While GEM (2023) indicated a low supportive environment for entrepreneurship in South Africa, what is questionable is the contribution of universities, government and industry (triple helix model actors) towards encouraging entrepreneurship in the form of student self-employment (Gachie,

2020). Ongoing debate positions the triple helix model actors as responsible for creating a conducive environment to stimulate student self-employment (Write, Siegel and Mustar, 2017; Ziakis, Vlachopoulou and Petridis, 2022). This debate on the importance of the triple helix model towards student self-employment is incomplete without considering entrepreneurial competence and social support. Consequently, a scholarly inquiry is required to evaluate the effect of the triple helix model , entrepreneurial competence, and social support on student self-employment.

In the context of this study, the triple helix model refers to the interaction among university initiatives, industry support, and government support to stimulate student self-employment (Galvao, Mascarenhas, Marques, Ferreira and Ratten, 2019). University initiatives refer to entrepreneurial education, concept development and business development initiatives directed towards university students to foster self-employment (Saeed, Yousafzai, Yani-de-Soriano and Muffatto, 2015; Liu and Huang, 2018; James, 2021). Industry support is described as the actions of the private sector to stimulate student self-employment by providing professional support, financial assistance, shared experiences, mentorship and coaching on entrepreneurial skills (Gachie, 2020). Government support refers to government policies, programmes, financial support and technology to promote student self-employment (Ahmad and Xavier, 2012).

Student self-employment refers to the student's entrepreneurial behaviour to achieve economic benefits, such as income and profits (Nandonde and Malaki, 2020). Entrepreneurial competence is defined as the entrepreneurial abilities of the student, such as networking, risk-taking, innovation, communication and financial literacy (Galvao et al., 2019; Lombardi, Sassetti and Cavaliere, 2019; Ng, Chan, Wut, Lo and Szeto, 2021). Social support refers to instrumental, emotional, informational and appraisal support given to students by family and friends to stimulate self-employment (Hou, Bai and Yao, 2010; Xia, Gu, Honglei, Huang, Yamei, Zhu and Cheng, 2020). The body of knowledge shows fragmented research directed to the triple helix model, entrepreneurial competence, social support, and student self-employment (Write et al., 2017; Ziakis et al., 2022). This has led to a lack of a comprehensive framework to understand an ecosystem that supports student self-employment.

1.3 Background to the study

The North American region had a high regard for the triple helix model. This is evidenced by the developments in the City of Chihuahua in Mexico (Cruz, 2022). Thus, over the past 40 years, the industry (i.e., manufacturing and international businesses) in the City of Chihuahua, Sonora, and Sinaloa have thrived on the effective use of the triple helix model (Moreno and Ramirez, 2021; Cruz, 2022). Cruz (2022) highlighted that Mexico developed a robust business ecosystem through business incubators and science parks to encourage small business start-ups. Consequently, the formation of a

strong business ecosystem was supported by the contribution of the universities, industry, and government (Cruz, 2022). Mexico aimed to boost its bilateral ties while encouraging cooperation among universities, industry and government and to promote entrepreneurial ventures as well as self-employment (Appelbaum, Lau, Foladori, Parker, Vazquez, Belmont and Figueroa, 2016).

The Asia region has also shown significant use of the triple helix model in its economic development through the involvement of its universities, government and industry (Lee, Chen, Li and Kim, 2017). However, there have been dissimilarities in the effectiveness of the triple helix model across different regions of Asia (Li, He and Zhao, 2019). Liua and Huang (2018) reported that the triple helix model is more paramount in China's developed states than in its developing regions. In India, the government initiated two projects, namely start-up India and stand-up India, with the assistance of universities and industry (Jena, 2020). The purpose of this project was to foster entrepreneurial skills within the youth. Also, as part of the programme, funds and technical skills were provided to support these start-up projects (Jena, 2020).

In the European context, many small business start-ups have come against the backdrop of the effective use of the triple helix model (Kreusel, Roth and Brem, 2017). This has become a requirement for many cities and regions in the European continent (Gkoumas and Christou, 2020). An example of this initiative is found in the City of Heidelberg in Germany where the "Innovation Lab" was founded in 2011 (van Widen, 2015). The Innovation Lab was founded by 3H Partners, a consulting company, to drive innovation through university students. This initiative brought together at least 100 scientists from universities and technocrats from the industry to work on projects meant to empower students through research and development (Van Widen, 2015) and to cultivate entrepreneurial skills within students so that they could initiate businesses in line with print and organic electronics (Kreusel et al., 2017).

The concept of the triple helix model also gained prominence in South America (De la Vega, Puente and Sanchez, 2019). This is signified by countries such as Brazil, Argentina and Venezuela, member states of the Triple Helix Association (De Mello, 2017). Brazil in particular, has strived to create a conducive environment for economic development (i.e., encouraging university students into start-up initiatives) through the collaboration of industry, universities and government (Coussi, Faccin and Balestrin, 2018).

Similar to other regions in the world, Africa was also introduced to the triple helix model. This introduction of the triple helix model to Africa was done with the assumption that it would lead to the rapid development of the continent's economy (Balogun, 2020; Okonofua, Odubanjo and Balogun, 2020). An example of the triple helix model in South Africa is the Entrepreneurship Development in

Higher Education (EDHE) programme that was introduced by the Department of Higher Education and Training (DHET) to encourage self-employment among university students (James, 2021). DHET has created the EDHE programme so that it can be coordinated by Universities South Africa (USAf), South African universities and the industry (James, 2021; EDHE, 2023). In this programme, a cohort of South African university students receive mentorship and coaching on entrepreneurship from the government, universities and industry to encourage self-employment (James, 2021; EDHE, 2023). However, despite such efforts, unemployment among university graduates in South Africa has remained high (Stats SA, 2022). Based on this background, the effectiveness of the triple hex model is questioned and requires further scholarly investigation.

1.4 Preliminary literature review

This section discusses the literature on university initiatives, entrepreneurial competence, government support, industry support, social support and student self-employment, which are discussed in this subsection. Empirical studies on these constructs are also discussed to identify research gaps. The next subsection presents university initiatives.

1.4.1 University initiatives

University initiatives refer to measures put in place by universities to promote student self-employment. Kraaijenbrink, Bos and Groen (2010) developed a scale to measure university initiatives through entrepreneurial education support, concept development support and business development support. Saeed et al. (2015) and Nandonde and Malaki (2020) also adopted Kraaijenbrink et al. (2010)'s scale to measure university initiatives. Consequently, Saeed et al. (2015) measured entrepreneurial education support through elective courses, project work, internship and workshops on entrepreneurship. Concept development support is measured through entrepreneurship awareness creation, motivation to start a business, provision of ideas to start a business and knowledge to start a business (Nandonde and Malaki, 2020). (Kraaijenbrink et al., 2010) presented business development as the provision of financial assistance to start a business, the use of university reputation to support students who start a business and the provision of a market for students who start a business. Write et al. (2017) concurred with Kraaijenbrink et al. (2010), Saeed et al. (2015) and Nandonde and Malaki (2020) that university initiatives should be measured through entrepreneurship courses, incubators and business plan competitions. Ziakis et al. (2022) added that university initiatives include student internship offices, pre-incubators, technology parks and innovation contests. This study adopted the measurement scale developed by Kraaijenbrink et al. (2010) due to its comprehensiveness. This scale has already been widely used by other researchers in different environments to measure university support towards student entrepreneurship.

1.4.2 Entrepreneurial competence

Entrepreneurial competence increases the efficacy of student self-employment (Mitchelmore and Rowley, 2013). Entrepreneurial competencies are measured through instrumental generic, interpersonal generic, systematic generic and professional-specific competencies (Ferrerias-Garcia, Sales-Zaguirre and Serradell-Lopez, 2021). Instrumental generic competencies refer to decision-making, time management, the use of new technologies, and communication (Ferrerias-Garcia et al., 2021). Interpersonal generic competencies are explained as teamwork, human relations, strategic thinking, interpersonal, and commitment skills. Systematic skills point to creativity, innovation, delegation skills, risk-taking and self-confidence. Professional-specific competencies are outlined as the business plan, processing and analysing financial information, and the ability to assess business situations (Ferrerias-Garcia et al., 2021). Entrepreneurial competence is fundamental for successful student self-employment.

1.4.3 Government support

Government support is also regarded as important in influencing student self-employment. Ahmad and Xavier (2012) pointed out that government support is measured through policies and programmes that are provided by the government to enable student self-employment. Vargas-Hernandez and Noruzi (2009) added that government support is measured by financial support and access to technology. Favourable government policies include tax information, licences, permits and regulations to promote student self-employment (Ahmad and Xaxier, 2012). Ziakis et al. (2022) outlined that government support should be measured through funding, taxation policies and national legislation towards entrepreneurship. The scale suggested by Ahmed and Xavier (2012) provides a comprehensive measure of government initiatives.

1.4.4 Industry support

Industry support is measured through commercial and professional support provided to students to stimulate self-employment (Ahmad and Xavier, 2012). Professional support includes training on marketing, financial and operational development plans. Rashed and Shah (2021) argued that the private sector should play a role in the Sustainable Development Goals (SDGs) through professional training for students. Industry support is measured through the provision of business mentors, incubators and financing (Ziakis et al., 2022). Students who receive commercial and professional training are most likely to achieve successful self-employment endeavours (Ahmad and Xavier, 2012; Ziakis et al., 2022).

1.4.5 Social support

Emotional, instrumental, informational, and appraisal support are the means by which social support is measured (Langford, Bowsher, Maloney, and Lillis, 1997). According to House (1981), providing empathy, love, care, and trust constitutes providing emotional support. The provision of material products and services, such as funding and start-up equipment, is known as instrumental support (Langford et al., 1997). According to House (1981), informational help refers to the dissemination of knowledge to a person in need. Communication related to self-evaluation is referred to as appraisal support. Social support increases the chances of successful self-employment.

1.4.6 Student self-employment

Student self-employment is defined as students' actual behaviour of pursuing an entrepreneurial activity (Fenech, Priya and Ivanov, 2019; Jena, 2020). The awareness and commitment of students to voluntarily participate in the process of creating, establishing, and managing a business to make money while assuming financial risk is another way to characterise self-employment (Linan, Nabi and Krueger, 2013; Ojiaku, Nkamnebe and Nwaizugbo, 2018). Self-employment requires a favourable environment for it to be stimulated (Gautam and Singh, 2015; Nguyen, 2017; Jena, 2020).

1.4.7 Previous empirical studies on university initiatives, government support, industry support, entrepreneurial competence, social support, and student self-employment

Extant literature shows that research that links the triple helix model, student self-employment, entrepreneurial competence and social support is fragmented and limited (Feola, Vesci and Parente, 2019; Su, Zhu, Chen, Jin, Wang, Lin and Xu., 2021). In their research involving 364 undergraduate students in Malaysia, Awang and Hudin (2017) found that entrepreneurial education, such as courses and workshops with entrepreneurship content, helps create a favourable entrepreneurial environment for students. Oluseye, Adebayo, Olulanu, Adesola and Omonike (2017) found that providing students with entrepreneurial education on idea generation and business plan development positively affects self-employment at Gateway Polytechnic in Nigeria. Studies by Awang and Hudin (2017) and Oluseye et al. (2017) are limited in the sense that they left out other factors, for example, government support, industry support, entrepreneurial competence and social support that are important in providing a comprehensive framework for student self-employment. The current study sought to close this theoretical gap by including university initiatives, government support, industry support, entrepreneurial competence and social support as critical factors for the student self-employment ecosystem.

Studies that have attempted to include government and industry support are also somewhat fragmented (Samo and Ul Huda, 2019; Ficapal-Cusi, Enache-Zegheru, and Torrent-Sellens, 2021; Wang, Cheng, Luo and Salman, 2022). In their quantitative research involving a sample of 310 academics, Samo and Ul Huda (2019) found a positive relationship between government support, university support and entrepreneurial intentions. Ficapal-Cusi et al. (2021) and Wang et al. (2022) found that industry support plays a significant mediation effect on the relationship between green economic regulations and firm performance. Hamdan, Khamis, Al Hawaj and Barone (2019) and Peng and Walid (2022) found that government support has a mediation effect on the relationship between entrepreneurship and economic growth, and entrepreneurs' perceived risk and sustainable entrepreneurship, respectively. Despite the existence of evidence that points to the importance of industry support and government support in stimulating a conducive environment for entrepreneurship (Hamdan et al., 2019; Ficapal-Cusi et al., 2021; Peng and Walid, 2022; Wang et al., 2022), there is still a lack of a comprehensive framework that includes both government support and industry support as factors that explain the relationship between university initiatives and student self-employment. This study sought to close this existing gap in the body of knowledge.

In their studies, Badawi et al. (2019), Galvao et al. (2019), Lombardi et al. (2019), Pardo-Garcia et al. (2020), Ng et al. (2021) and Mengistu and Negasie (2022) found that entrepreneurial competence such as networking, risk-taking, innovation, negotiation, creativity skills, time management and teamwork result in student self-employment. There is also overwhelming evidence in the body of knowledge indicating that entrepreneurial competence is mediating in entrepreneurial empirical studies (Asmawiyah et al., 2020; Khan et al., 2020). Minai, Raza, bin Hashim, Zain and Tariq (2018) found that entrepreneurial competence mediates the relationship between entrepreneurial education and firm performance. Asmawiyah et al. (2020) found that entrepreneurial competence mediates the relationship between human capital and business performance. Khan et al. (2020) and Gull, Asghar, Ahmed, Muhammad, Jameel and Ali (2021) found that entrepreneurial competence has a mediation effect on the relationship between entrepreneurial orientation and entrepreneurial performance. Kusumawijaya and Astuti (2021) found that entrepreneurial competence has a mediation effect on the relationship between personality traits and entrepreneurial intentions. In their study, Aftab, Veneziani, Sarwar and Ishag (2022) found that entrepreneurial competence has a mediation effect on the relationship between entrepreneurial orientation and firm performance. However, there is no existing study that has tested the mediation effect of entrepreneurial competence on the relationship between university initiatives and student self-employment. The current study sought to close this existing gap in the body of knowledge.

Several studies found that social support, for example, emotional, financial and guidance from family and friends, is related to successful entrepreneurial ventures (Hou et al., 2010; Xia et al., 2020). A study carried out by Neneh (2022) found that social support in the form of advice, guidance and assistance from friends and family has a positive significant moderating influence on the relationship between entrepreneurial passion and entrepreneurial intention through self-efficacy. Jadmiko (2021) found that social support (i.e., moral support) has a moderating effect on the relationship between the attitude of becoming a social entrepreneur and social entrepreneurial intentions. Son, Jung and Lee (2018) and Wang and Huang (2019) found that social support has a moderating effect on the relationship between entrepreneurial self-efficacy and entrepreneurial intentions. Muhammed, Ringim and Kura (2020) found that social support has a moderating effect on the relationship between entrepreneurial education and entrepreneurial intention. Despite the existence of evidence that points to social support as an important construct within entrepreneurial ventures, no study has tested the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support. The current study sought to close this gap in the body of knowledge.

1.5 Problem statement

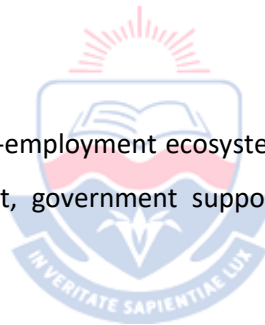
As already indicated in the introduction section, unemployment has remained high in South Africa. Stats SA (2023) reported that the national unemployment rate was at 32,9 per cent in the first quarter of 2023. Graduate youth unemployment was at 59,6 per cent among the age category of 15 to 24 years, and 40,5 per cent among those aged 25 to 34 years (Stats SA, 2022). The preceding years have also shown a continuous increase in unemployment where 2019 was at 28,4 per cent, 2020 at 29,2 per cent, 2021 at 33,5 per cent and 2022 at 32,7 per cent (Macrotrends, 2023). Unemployment leads to a decrease in household income, reduced standard of living, rise in poverty and increase in crime. Faced with such socio-economic problems due to high unemployment, universities, industry and the government need to realise their different roles in fostering student self-employment to fight unemployment (Ayalew and Zeleke, 2018). Progressive economies make use of universities, government and industry to promote student self-employment (Ayalew and Zeleke, 2018; Jena, 2020). However, the commitment of universities, industry and the government to fostering student self-employment in South Africa is questionable (Gachie, 2020). This calls for the need for a scholarly investigation on the effect of university initiatives, industry support and government support on student self-employment. This investigation should be considered incomplete without including the role of entrepreneurial competence and social support in fostering student self-employment (Asmawiyah et al., 2020; Muhammed et al., 2020). Existing literature on the triple helix model,

entrepreneurial competence and social support is fragmented. While some studies have focused on university entrepreneurial education and self-employment (Awang and Hudin, 2017; Oluseye et al., 2017), others have focused on university entrepreneurial education and self-employment (Samo and Ul Huda, 2019), government support, industry support and entrepreneurship (Hamdan et al., 2019), mediation effect of industry support and government support on the relationship between economic regulation and entrepreneurial performance (Ficapal-Cusi et al., 2021; Peng and Walid, 2022; Wang et al., 2022). Such fragmentation in the literature calls for the development of a comprehensive framework for explaining a successful student self-employment ecosystem founded on the integration of university initiatives (i.e., educational support, concept development and business development support), industry support (i.e., marketing, financial and operational), government support (i.e., government policies, programmes, financial support), entrepreneurial competence (i.e., instrumental, interpersonal, systematic and professional) and social support (i.e., instrumental, emotional, informational and appraisal).

1.6 Research objectives

1.6.1 Primary research objective

To develop a multi-tiered student self-employment ecosystem model that functions on the basis of university initiatives, industry support, government support, social support and entrepreneurial competence in South Africa.



1.6.2 Theoretical research objectives

1. To review the literature on the triple helix model, human capital theory, social capital theory and entrepreneurial action theory.
2. To review the literature on university initiatives, entrepreneurial competence, industry support, government support, social support towards student self-employment.

1.6.3 Empirical research objectives

1. To evaluate students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa.
2. To measure the effect of university initiatives on student self-employment in South Africa.
3. To measure the effect of social support on entrepreneurial competence.

4. To establish the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment in South Africa.
5. To investigate the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa.

1.7 Research questions

1. What are student perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa?
2. Do university initiatives positively affect student self-employment in South Africa?
3. Does social support positively affect entrepreneurial competence?
4. Do entrepreneurial competence, industry support and government support mediate the relationship between university initiatives and student self-employment in South Africa?
5. Does social support play a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa?



1.8 Theoretical framework

To achieve theoretical robustness, this study was grounded in four theories: the triple helix model (Etzkowitz and Leydesdorff, 1995), the entrepreneurial action theory (Schumpeter, 1934), human capital theory (Mincer, 1958; Schultz, 1961; Becker, 1962) and social capital theory (Bourdieu, 1984; Coleman, 1988; Putnam, 1993). These theories provided theoretical grounding to the study constructs that include university initiatives, industry support, and government support (triple-helix model), student self-employment (entrepreneurial action theory), entrepreneurial competence (human capital theory) and social support (social capital theory). The triple helix model is discussed next.

1.8.1 Triple helix model

The triple helix model was first theorised by Henry Etzkowitz and Loet Leydesdorff in the 1990s (Etzkowitz, 1993; Etzkowitz and Leydesdorff, 1995). The model refers to the relationships that exist between universities, industry and government to foster entrepreneurial innovation, for example, student self-employment (Etzkowitz, 1993; Etzkowitz and Dzisah, 2013). Etzkowitz and Leydesdorff (2000) further distinguished between three types of the triple helix model, namely the *static model*,

the *laissez-faire model* and the *balanced model*. The statist triple helix model shows the government having control over universities and the industry. The *laisses-faire* triple helix model exist when industry, universities and government are extricated and only interact across strong boundaries. Lastly, the balanced triple helix model relates to balanced interactions between government, industry, and universities (Cai and Etzkowitz, 2020). This study made use of the balanced triple helix model where industry, universities and government work together to influence student self-employment. The balanced triple helix model was appropriate in this study because it argues that universities, industry and government should effectively work together to influence a thriving economy by stimulating student self-employment. Thus, a balanced triple helix model encourages equal contribution through the production, transfer and use of knowledge to stimulate entrepreneurial activities such as self-employment (Organisation for Economic Co-operation and Development [OECD], 2018). However, the balanced triple helix model is criticised for lacking a solid theoretical foundation (Shinn 2002; Cooke 2005). Furthermore, the model fails to acknowledge the importance of society in making knowledge-based economic decisions (Viale and Pozzali 2010). Despite the this criticism, the triple helix model remains the most applicable model in the current study considering the application of university initiatives, government support and industry support in this study. Cai and Lattu (2002) also came to the defence of the triple helix model, indicating that society cannot be positioned at the same level as industry, universities, and government since it is not a formal institution. Leydesdorff and Etzkowitz (2017) also affirmed that it is not necessary to transform the triple helix model into the quadruple to accommodate society because it is not an institution. Although society is important, its role should be placed separately from the triple helix model so that its influence remains unique. Also, the triple helix model has remained the most useful model for studies that seek to evaluate the contributions of universities, industry and government (Ridho, Vinichenko, and Makushkin, 2018; Feola et al., 2019; Marx, 2019; Su et al., 2021). The triple helix model was, therefore, applied in this study to provide a theoretical grounding for university initiatives, industry support and government support.

1.8.2 Entrepreneurial action theory

The entrepreneurial action theory governs a set of actions ranging from the creation of new organisations, new products and services, new methods of production and new sources of supply (Schumpeter, 1934). The entrepreneurial action theory is traced back to labour theories first introduced by political economists (Smith, 1776; Ricardo, 1817). This theory views an entrepreneur as a change agent who catalyses the economy by fulfilling a particular function. McMullen and Shepherd (2006) stated that the entrepreneurial action theory is based on the premise that one needs to take action to fulfil entrepreneurial ambitions. It is also argued that entrepreneurial action occurs due to

the environment in which an individual exists (Alonso and Kok, 2021). In the context of the present study, entrepreneurial action refers to student self-employment that occurs as a result of a conducive environment. The conducive environment is portrayed as involving the interaction of university initiatives, government support, industry support, entrepreneurial competence and social support. Based on this reasoning, the entrepreneurial action theory is fit to represent self-employment since it is an entrepreneurial action.

1.8.3 Human capital theory

The human capital theory has been dominating the economics of education since the mid-twentieth century. It started with the work of Mincer (1958), Schultz (1961) and Becker (1962). This theory is of the idea that education and training are crucial for acquiring skills (entrepreneurial competence), which in turn influence entrepreneurship, for example, self-employment. The human capital theory outlines that individuals with skills are most likely to perform well in the tasks given to them, thereby influencing self-employment (Fix, 2018). Carneiro and Vignoles (2010) argued that the human capital theory regards education and training as an investment that translates to productivity. However, critics of the theory argued that the theory is flawed, overly simplistic and confounds labour with capital (Ross, 2021). Despite its criticism, the human capital theory remains instrumental in explaining the foundation of skills leading to entrepreneurial competence. It should also be noted that the human capital theory was successfully applied in previous studies to provide a theoretical grounding for entrepreneurial competence (Asmawiyah et al., 2020; Gull et al., 2021; Aftab et al., 2022).

1.8.4 Social capital theory

The social capital theory was introduced by Bourdieu (1984), Coleman (1988) and Putnam (1993) to describe a network of beneficial relationships among friends, family, and society. The social capital theory is defined as the aggregate of the actual or potential resources owned by members of a particular group, for example, family, friendship and society to ensure that such resources are beneficial to its members (Jolaei, Nor, Khani and Yusoff, 2013). Machalek and Martin (2015) also argued that the social capital theory describes the existence of beneficial social relationships. To understand the argument by Machalek and Martin (2015), one should imagine the influence of social support that friends, family and society can provide to influence student self-employment. Such support can be provided in the form of guidance, sharing of experiences, and financial and emotional support. Machalek and Martin (2015) further pointed out that individuals who receive support (i.e., financial and emotional) from their family and friends towards a particular activity, are most likely to perform well. Studies by Wang and Huang (2019), Jadmiko (2021) and Neneh (2022), for example,

applied the social capital theory to provide a theoretical grounding for social support. Hypotheses development is discussed in the next section.

1.9 Hypotheses development

1.9.1 Effect of university initiatives on student self-employment

As the triple helix model indicates, universities play an important role in a knowledge economy (Budyldina, 2018; Lehmann, Meoli, Paleari and Stockinger, 2020). Universities are traditionally known for carrying out teaching and research functions. However, this arrangement is changing worldwide to accommodate entrepreneurship, patents and knowledge capitalisation (Rice, 2019). According to Gachie (2020), universities should set up industrial parks, innovation incubators, conferences, training, workshops and staff consultancy to encourage a culture of entrepreneurship within the university. In recent years, university entrepreneurship initiatives have been highlighted as a key catalyst to influence student self-employment, which is critical for innovations and economic growth (Sandström, Wennberg, Wallin and Zherlygina, 2018). Studies in the triple helix model, for example, Feola et al. (2019) and Su et al. (2021), found that university initiatives such as teaching and learning entrepreneurial content, influence student self-employment. Soares and Podcameni (2014) also found that the entrepreneurial actions of universities, such as establishing entrepreneurial hubs, workshops and mentorships, have a positive effect towards self-employment. Brem and Radziwon (2017) also found that universities play a significant role in driving student self-employment. It was, therefore, hypothesised that:

H1: University initiatives have a positive effect on student self-employment in South Africa.

1.9.2 Mediating effect of entrepreneurial competence on the relationship between university initiatives and student self-employment

Entrepreneurial competence refers to a person's possession of entrepreneurial-related skills, which include networking, risk-taking, innovation, communication, negotiation, creativity, and financial literacy (Asmawiyah et al., 2020). As already indicated, entrepreneurial competence is grounded in the human capital theory, which is based on the premise that a student's entrepreneurial competence is acquired through education and training (Mincer, 1958; Schultz, 1961; Becker, 1962). Aftab et al. (2022) and Hahn, Minola, Bosio and Cassia (2020) found that individuals with entrepreneurial competence have a high capacity to successfully execute entrepreneurial ventures. Studies have also shown that entrepreneurial competence plays a mediation role in most entrepreneurial studies (Khan et al., 2020; Asmawiyah et al., 2020). Khan et al. (2020) found that entrepreneurial competence has a mediating effect on the relationship between entrepreneurial orientation and entrepreneurial

performance. Mohamad and Sidek (2013) found that entrepreneurial competence affects the relationship between microfinance and small business growth. However, no study has tested the mediation effect of entrepreneurial competence on the relationship between university initiatives and student self-employment. This study sought to close this gap in the body of knowledge. Although authors have shown various skills that lead to entrepreneurial competence, this study focused on instrumental generic, interpersonal generic, systematic generic and professional generic skills. It was, therefore, hypothesised that:

H2: Entrepreneurial competence has a positive mediation effect on the relationship between university initiatives and student self-employment.

1.9.3 Mediating effect of industry support on the relationship between university initiatives and student self-employment

The industry is made up of enterprises that include small, micro, medium and large enterprises (Gachie, 2020). According to the triple helix model, the industry should play its part in supporting a knowledge economy through the provision of professional skills. Such professional skills include marketing plan training, financial plan training and operational plan training (Ahmad and Xavier, 2012). McKechnie, Howieson, Hobbs and Semple (2014), Ganguli and Matar (2016) and Wakefield et al. (2022) found that there is a positive relationship between industry support (i.e., professional mentorship and coaching) and student self-employment. Feola et al. (2019) and Gachie (2020) posited that the industry should take a hands-on approach to accelerate student self-employment. Ficapal-Cusi et al. (2021) found that industry support has a mediation effect on the relationship between environmental assets and economic firm performance. Wang et al. (2022) found that industry structural support has a mediation effect on the relationship between environmental regulations and a firm's green economy efficiency. Despite existing evidence on the mediation role that industry support plays in economic activities, there is still no study that has tested the mediation effect of industry support on the relationship between university initiatives and student self-employment. This should be considered a gap in the body of knowledge. It was, therefore, hypothesised that:

H3: Industry support mediates the relationship between university initiatives and student self-employment.

1.9.4 Mediating effect of government support on the relationship between university initiatives and student self-employment

In the context of this study, government support refers to the university student entrepreneurial support provided by DHET and USAf through the EDHE programme (EDHE, 2023). DHET and USAf

provide infrastructural, legislative, financial and entrepreneurial support to foster self-employment among university students (Robertson, Pitt and Ferreira, 2020; James, 2021; EDHE, 2023). The government also has support institutions, for example, the Small Enterprise Development Agency, the National Youth Development Agency and the Department of Trade and Industry to assist university students to access entrepreneurial support. Popa (2017), Gachie (2020) and Wakefield et al. (2022) conceded that the government should ensure that an environment for entrepreneurship is created to trigger student self-employment. Oyebanji (2013), Feola et al. (2019) and Su et al. (2021) found that government support affects student entrepreneurship. Despite the existence of evidence on the mediation effect of government support in entrepreneurial ventures (Hamdan et al., 2019; Peng and Walid, 2022), no study has tested the mediation role of government support on the relationship between university initiatives and student self-employment. The current study sought to close this theoretical gap and it was, therefore, hypothesised that:

H4: *Government support mediates the relationship between university initiatives and student self-employment.*

1.9.5 Moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support

Social support is defined as instrumental, emotional, informational and appraisal support given to university students to foster self-employment behaviour (Langford et al., 1997; Hou et al., 2010; Xia et al., 2020). The social capital theory has shown that social support is important in triggering entrepreneurial intentions. Neneh (2022) found that social support has a positive moderating effect on the relationship between entrepreneurial passion and entrepreneurial intention through entrepreneurial efficacy. Son et al. (2018) found that social support has a moderate effect on the relationship between entrepreneurial self-efficacy and entrepreneurial intention. Despite the existence of studies that provide evidence of the importance of social support in stimulating entrepreneurial intentions (Son et al., 2018; Neneh, 2022), there is no existing study that has tested the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support. Based on this background, it was hypothesised that:

H5: *Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence.*

H6: *Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through industry support.*

H7: *Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through government support.*

1.9.6 Effect of social support on entrepreneurial competence

Social support through family and friends has an effect on entrepreneurial competence. Thus, students require social support in different forms in order to trigger their entrepreneurial competence (Xia et al., 2020). It should be understood that social support such as financial assistance from family and friends stimulate entrepreneurial competence. Students also require social support such as physical support in order to boost their entrepreneurial competence (Son et al., 2018). It should also be noted that social support such as emotional support has an effect on student self-employment (Xia et al., 2020). It is upon this background that this research hypothesised that:

H8: *Social support has a positive effect on interpersonal generic competence (i.e., instrumental generic competence, interpersonal generic competence, and systematic generic competence).*

1.10 Conceptual framework

This study conceptualised that university initiatives have an effect on student self-employment; social support has an effect on entrepreneurial competence; entrepreneurial competence, industry support and government support have a mediation effect on the relationship between university initiatives and student self-employment; and social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support. The proposed conceptual framework is illustrated in Figure 1.2.

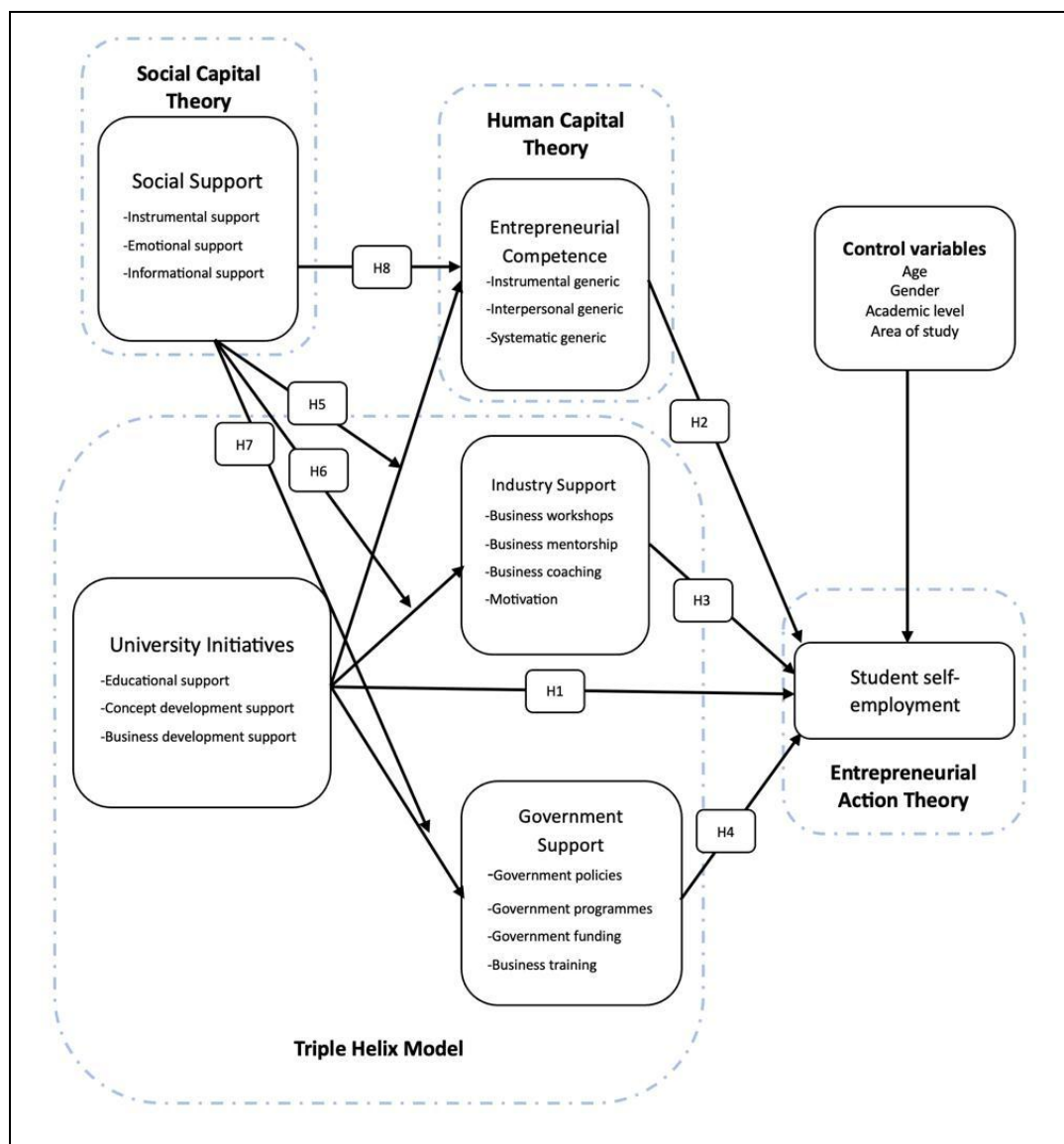


Figure 1.1 Conceptual framework

Source: Author's own construction

1.11 Summary of the methodology

This section summarizes the research methodology of the study. Saunders, Lewis and Thornhill (2016) provided a clear definition of a research methodology as the “steps researchers take to collect and analyse data”. The steps comprise deciding when and how often to collect data; developing or selecting measures for each variable; identifying a sample or test population; choosing a strategy for contacting strategies; planning the data analysis; and presenting the findings. Saunders et al. (2016) further simplified the research process by making use of a multilayered framework which is referred to as the research onion in Figure 1.2.

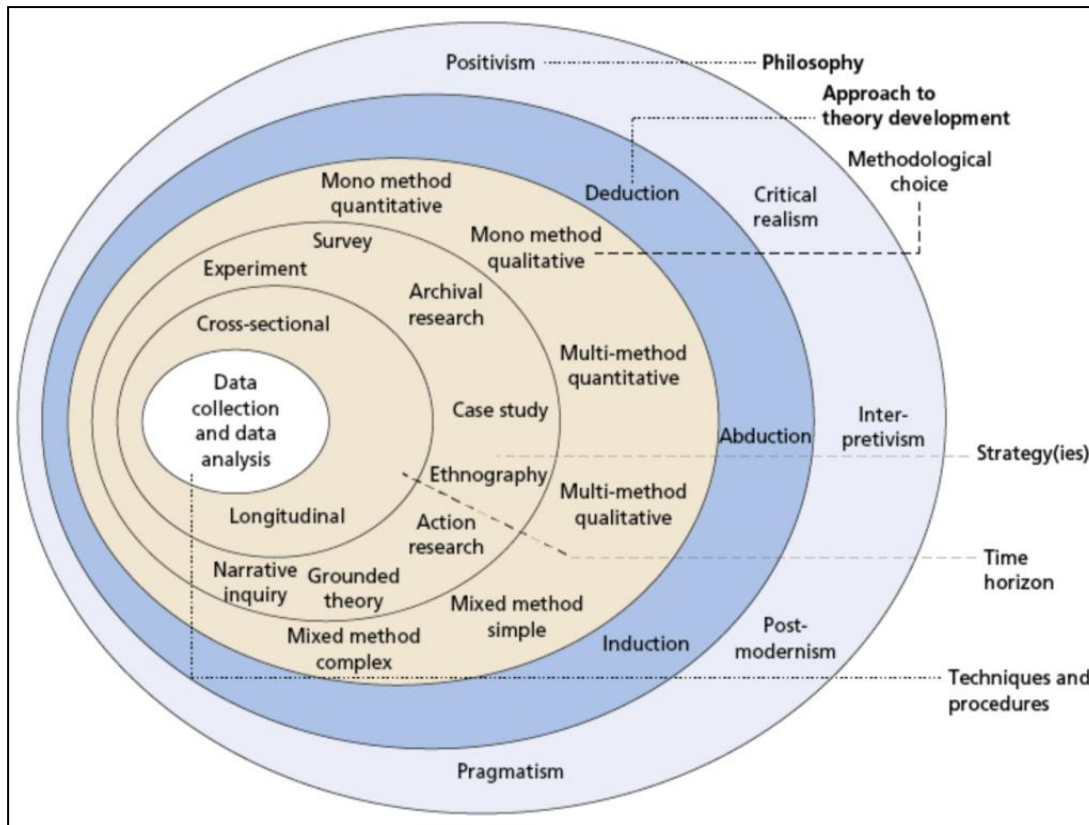
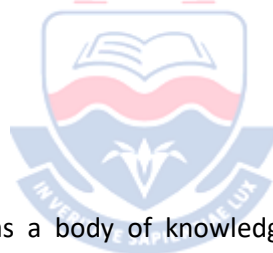


Figure 1.2 Research onion

Source: Saunders et al. (2016)



1.11.1 Research philosophy

Research philosophy is referred to as a body of knowledge formulated by a set of beliefs and assumptions (Saunders et al., 2016). Melnikovas (2018) described research philosophy as a layer of foundation for research in terms of ontology and epistemology. Several philosophies are outlined in Saunders's research onion, among them are pragmatism, positivism, interpretivism and realism (Saunders et al., 2016). Pragmatism is a philosophical view that focuses on the link between theory and practice. The philosophy of positivism is the idea that scientific knowledge is the main credible source of knowledge. Interpretivism is an approach to social science that opposes the positivism of natural science (Gemma, 2018). According to Saunders et al. (2016), realism is the philosophical perspective that accords to things that are known or observed as existing or having a nature that is independent of anyone thinking about or observing them. The researcher applied the positivist philosophy in this study since its research objectives can be operationalised using quantitative methods.

1.11.2 Research approach

According to Saunders et al (2016), a research onion is a research approach that can either be inductive or deductive. A deductive research strategy begins with the general and narrows it down to details, in contrast to an inductive research approach, which is described as working from the specific to the general. Moreover, the deductive method emphasises using literature to find concepts and theories that are then verified by empirical evidence. The inductive approach on the other hand concentrates on developing a theory based on the outcome of the data analysis (Zefeiti and Mohamad, 2015). This study tested theories and hypotheses. Therefore, the study focused on a deductive orientation.

Additionally, this research was based on a quantitative research approach. Yilmaz (2013) indicated that quantitative and qualitative research paradigms differ in their theoretical, methodological and epistemological underpinnings. While qualitative research is informed by an interpretive epistemology, quantitative research is based on positivist epistemology. By employing a quantitative research methodology, the investigator seeks to investigate diverse realities with the aim of augmenting student self-employment.

1.11.3 Research strategy and time horizons

A research strategy is a general blueprint that is used to address research questions, define research goals, choose sources for data collection, and consider research limitations. (Al-Ababneh, 2020; Blom, Cornesse, Friedel, Krieger, Fikel, Rettig, Wenz, Juhl, Lehrer, Möhring and Naumann, 2020). Various research strategies can be found in a research onion, namely, survey, experiment, grounded theory, ethnography, case study, action research, archival research, and narrative inquiry (Saunders et al., 2016). The researcher used a survey strategy as it usually coincides with a deductive orientation (Saunders et al, 2016). This strategy allowed the researcher to collect data in a more efficient, accurate and timeous manner (Zikmund, 2013).

Time horizons have two types of data collection approaches: cross-sectional studies and longitudinal studies (Saunders et al., 2016). In cross-sectional studies, data is collected on one occasion over a short period, whereas longitudinal studies allow a researcher to collect data over a longer period (Al-Abebneh, 2020). A cross-sectional study was adopted by this research to examine the effect of the triple helix model, entrepreneurial competence, and social support on self-employment of students in South Africa.

1.11.4 Target population

A population can be described as all persons or substances that the researcher desires to study (Rashid, Rasheed, Amirah, Yusof, Khan, and Agha, 2021). The target population for this study were self-

employed university students in South Africa who participated in the EDHE programme in 2023 (James, 2021). The researcher considered self-employed students who were at the age of 18 years or above during the time of data collection. University students in South Africa who were participating in the EDHE programme were selected as the right population for this study because they are common stakeholders in the triple helix model where a knowledge economy is concerned (Degtjarjova, Lapina and Freidenfelds, 2018). South African university students who were participating in the EDHE programme were also suitable for this research because they have acquired enough experience to understand the research phenomenon that involved the effect of university initiatives, industry support and government support on student self-employment. USAf, a partner to the DHET, indicated that approximately 1 200 students from South African universities were participating in the EDHE programme in 2023. The sample size in this study was 375 university students who participated in the programme in 2023 (EDHE, 2023). This sample size was based on the calculation of the average sample sizes of previous similar studies on student entrepreneurship and self-employment (Nguyen, 2017; Awang and Hudin, 2017; Faloye and Olatunji, 2018; Shah, Amjed and Jaboob, 2020; Kusumawijaya and Astuti, 2021).

1.11.5 Sampling

This study made use of non-probability sampling in the form of a convenience sampling strategy. The convenience sampling strategy was used due to its ability to collect data from the first available respondents (Saunders et al., 2016). Using a convenience sampling strategy was deemed appropriate because of the homogenous nature of the target respondents (Zikmund, 2013). The target respondents were a homogenous group of South African university students who were participating in the EDHE programme in 2023. These students were exposed to similar conditions in line with the EDHE programme. The convenience sampling strategy was also chosen because of its cost- and time-effectiveness (Yilmaz 2013). It is less costly to collect data by making use of a convenience strategy when the target respondents are homogenous. Also, this method allows data to be collected within the least possible time. Non-probability sampling is where all units selected are not known or confirmed (Rashid et al., 2021). The sampling techniques for this study was, therefore, based on the non-probability sampling method.

1.11.6 Data collection

1.11.6.1 Secondary research data

Secondary data is described as data that may have been previously collected and can be considered to be reused for a new study for which the data collected was not initially intended. One major

advantage of secondary data is that it is information that is readily available, therefore, minimal resources are required in this phase of the research (Boslaugh, 2007; Moore, Harrison and Hair, 2021). However, there are disadvantages of uncertainty about whether there will be mismatches or errors in the data collection process, which may influence the interpretation of the data (Martins, Cunha and Serra, 2018).

1.11.6.2 Primary research data

A self-completion questionnaire developed from the literature was used to collect data from 375 self-employed South African university students participating in the EDHE programme in September 2023. The self-completion questionnaire was physically distributed to self-employed university students during the EDHE Studentpreneurs event that took place in September 2023. The physical questionnaire distribution took place when students arrived to participate at each EDHE event at the University of the Western Cape in Cape Town from 4 to 8 September 2023. A screening question was used to ensure that only self-employed university students participating in the EDHE programme completed the questionnaire once. Questionnaire collection boxes were placed at the exit points of the venue so that the completed questionnaires could be deposited with the aid of a research assistant. A permission letter to collect data from students participating in the EDHE programmes was obtained from the EDHE programme manager. A total of 410 questionnaires were distributed but only 375 were returned fully completed. This gave a response rate of 91 per cent. A high response rate was attributed by the use of a pilot study and application of previously validated measures.

1.11.6.3 Questionnaire design

The purpose of the study and the respondents' right to anonymity and withdrawal at any time were outlined on the first page of the questionnaire. The first page of the questionnaire also included informed consent and screening questions to ensure that only South African university students who had participated in the EDHE programme since 2016 and were 18 years or older participated in the study. Section A included biographical questions of the respondents, for example, age, gender, and educational qualification. Sections B to E measured university initiatives, entrepreneurial competence, industry support, government support, student self-employment and social support (Feola et al., 2019; Field, 2019). For the assessment, a five-point Likert scale was used, with 1 = *Strongly disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, and 5 = *Strongly agree*. To get around the possible drawbacks of a single item that could be impacted by error margins, this study used a multi-measurement item scale for each construct (Hair et al., 2013). To ensure content validity, all questionnaire items were modified from previously published works. Table 1.1 presents the structure of the questionnaire and subconstructs investigated.

Table 1.1 Structure of the questionnaire and subconstructs investigated

Construct	Type of construct	Measurement	Hypotheses tested	Source
University initiatives	Independent	Continuous	H1, H2, H3, H4, H5, H6, H7	Kraaijenbrink et al. (2010); Saeed et al. (2015); Nandonde and Malaki (2020)
Entrepreneurial competence • Instrumental generic • Interpersonal generic • Systematic generic	Mediator	Continuous	H2, H5, H8	Ferreras-Garcia et al. (2021)
Industry support	Mediator	Continuous	H3, H6,	Ahmad and Xavier (2012)
Government support	Mediator	Continuous	H4, H7,	Ahmad and Xavier (2012)
Students self-employment	Dependent	Continuous	H1, H2, H3, H4, H5, H6, H7	Field (2019)
Social support	Moderator	Continuous	H5, H6, H7, H8	Gubbins, Harrington and Hines (2020)

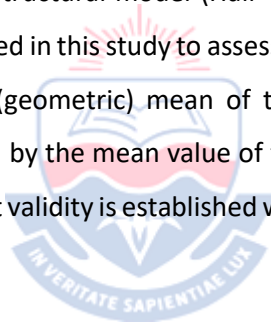
1.11.6.4 Control variables

This study considered control variables that included age, gender, academic level and area of study. These control variables were provided as possible alternative explanations for student self-employment. Previous studies have associated age and gender as reasons for people to be in business. In their study, Ramadani, Rahman, Salamzadeh, Rahaman and Abazi-Alili (2022) showed that gender plays a significant role in influencing students into entrepreneurship. Zellweger, Sieger and Halter (2011) pointed out that males are most likely to engage in entrepreneurship than females. Age was also found to be a determinant for entrepreneurship behaviour among people (Neneh, 2020). Zellweger et al. (2011) agreed that age and gender are explanations for entrepreneurship behaviour. Also, educational background was found to be another determinant for entrepreneurship behaviour (Shirokova, Osiyevskyy, and Bogatyreva, 2016).

1.11.7 Data analysis

1.11.7.1 Evaluation of the measurement model

To ensure content validity, the survey instrument was vetted by a panel of experts, such as entrepreneurship academics, industry experts and government directors with knowledge of the triple helix model, student self-employment, entrepreneurial competence and social support. The research objectives were operationalised using a component-based structural equation modelling (SEM), (SmartPLS 4). According to Hair, Risher, Sarstedt and Ringle (2019), SEM includes an evaluation of the measurement model to ensure that the model is reliable and valid. To evaluate the measurement model, SmartPLS 4 was computed through the factor loadings (FL); Cronbach's alpha (CA); composite reliability coefficients (CR); and the average variance extracted (AVE). The aforementioned tests were deemed acceptable upon reaching a minimum threshold of 0.7 (FL), 0.7 (CA), 0.7 (CR) and 0.5 (AVE) (Hair et al., 2019). Also essential to consider as part of an evaluation of the measurement model was discriminant validity. Discriminant validity measures the extent to which a construct is empirically distinct from other constructs in the structural model (Hair et al., 2019). The heterotrait-monotrait (HTMT) ratio of the correlations was used in this study to assess discriminant validity (Voorhees, Brady, Calantone, and Ramirez, 2016). The (geometric) mean of the average correlations for the items measuring the same construct, divided by the mean value of the item correlations across constructs, is known as the HTMT. The discriminant validity is established with the HTMT if all the computed values are lower than 0.9.



1.11.7.2 Testing of hypotheses and research objectives

The variance inflation factor (VIF) was utilised to evaluate the collinearity of the formative indicators prior to testing hypotheses. The VIF values ought to be as low as possible (Mason and Perreault, 1991). Additionally, the R^2 value of the endogenous constructs was investigated. Higher values of the R^2 indicate a greater explanatory power. The R^2 ranges from 0 to 1. Three phases of testing were used to evaluate the research hypotheses: direct effects (H1 and H8), mediation effects (H2-H4), and moderated-mediation effects (H5-H7). A total of 5 000 subsamples with a 95% confidence interval were used in the bootstrapping process of SEM using SmartPLS 4 to test the hypotheses. Hair et al. (2019) argued that model fitness is not necessary when making use of SmartPLS 4. Therefore, there was no special emphasis on the model fitness of the study model. Conditions required for mediation to exist were taken into consideration in order to examine the effects of mediation. Therefore, in order for mediation to be present, there must be a statistically significant correlation between the outcome construct (self-employment) and the mediators (entrepreneurial competence, industry support, and government support); and the predictor (university initiatives) and the mediators. Indirect effects

were also investigated after the direct effects were evaluated. To ascertain the mediation effects, the bootstrapping procedure was employed to evaluate the indirect effects and their statistical significance, in compliance with the guidelines established by Hair et al. (2009). Using SmartPLS 4, bias-corrected bootstrapping was used to assess the indirect effect on student self-employment for 5 000 subsamples with a 95% confidence interval. There are two types of mediation effects: partial and full. Partial mediation is assumed when both direct and indirect effects are significant, whereas if the indirect effect is significant and the direct effect is not significant then full mediation is assumed (Cheung and Lau, 2008).

Moderated mediation effects were also assessed in line with the research objective. To assess moderation effects, as suggested by Hair et al. (2019), the tests were carried out using the bootstrapping method on 5 000 subsamples with a 95 % confidence interval. As suggested by Muller, Judd, and Yzerbyt (2005) and Preacher, Rucker, and Hayes (2007), two conditions were looked at before testing moderated mediation effects. According to these requirements, there must be a substantial interaction between the predictor construct and moderators on mediating constructs, and the mediator and moderator on the outcome construct. The next section presents the chapter outline.

1.12 Chapter outline

Chapter 1

The chapter is organised to present the introduction, background, preliminary literature review, problem statement, research objectives, research questions, and theoretical framework. Also, the chapter presents the hypotheses development, conceptual framework, summary of the methodology, chapter outline and definition of terms.

Chapter 2

In this chapter, the focus is placed on providing an understanding of the study context. This chapter, therefore, emanates from a broad context to discuss the definition of entrepreneurship and its importance. The chapter continues to discuss the application of the student self-employment in different parts of the world before eventually zooming to the South African context which is the primary focus of the current study. Also, in this chapter challenges facing student entrepreneurship are discussed to add to the justification of the study.

Chapter 3

This chapter focuses on the theoretical and conceptual framework development. The discussion of the chapter is, therefore, based on the theoretical framework to include the triple helix model, the entrepreneurial action theory, the human capital theory, and the social capital theory. Also, included

in the discussion are the key constructs of the study that include university initiatives, student self-employment, industry support, government support, entrepreneurial competence, and social support.

Chapter 4

The chapter discusses the research methodology that was applied in this study. In line with the purpose of the present chapter, the discussion centres on the research paradigm, methodology and design. This chapter also discusses the data collection methodology that was applied in the study. Also, the sampling design, data collection instrument, validity and reliability, limitation of the methodology applied and ethical considerations are discussed in the chapter. The discussion of each technique applied in this study was accompanied by sufficient justification.

Chapter 5

This Chapter presents the data analysis in line with the research objectives and the research hypotheses. The results from the data analysis are presented in order to answer the research questions. A discussion of the results is also provided in relation to previous empirical studies.

Chapter 6

This chapter focuses on the presentation of the student self-employment ecosystem developed from this study. Thus, an explanation is provided regarding the roles of each of the multi-tiered stakeholders involved in the success of the student self-employment ecosystem.

Chapter 7

The final chapter presents the conclusions, contributions of the study and recommendations from the research.

1.13 Definition of key terms

- **University initiatives:** University initiatives refer to measures put in place by universities to promote student self-employment (Kraaijenbrink et al., 2010).
- **Government support:** Government support refers to government activities aimed at stimulating student self-employment, for example, government policies and programmes (Vargas-Hernandez and Noruzi, 2009; Ahmad and Xavier, 2012).
- **Industry support:** Industry support is measured through commercial and professional support provided to students to stimulate self-employment (Ahmad and Xavier, 2012).

- **Entrepreneurial competence:** Entrepreneurial competencies are measured through instrumental generic, interpersonal generic, systematic generic and professional specific competencies (Ferrerias-Garcia et al., 2021).
- **Social support:** Social support is measured through emotional support, instrumental support, informational support and appraisal support (Langford et al., 1997).
- **Student self-employment:** Students' self-employment is defined as students' actual behaviour of pursuing an entrepreneurial activity (Fenech et al., 2019; Jena, 2020).

1.14 Chapter summary

This chapter has presented the overall introduction and background of the current study. In line with the agenda of the chapter, a preliminary literature review, problem statement, research objectives and research questions were also presented in the chapter. The chapter also presented the theoretical framework, hypotheses development, conceptual framework and contributions of the study. Furthermore, the chapter presented a summary of the research methodology, chapter outline and definition of terms. The next chapter presents the literature review to discuss the context of the study.



Chapter 2

LITERATURE REVIEW - CONTEXT ON THE STUDY

2.1 Chapter overview

The previous chapter has provided the overall study background to justify the need for this research. In the current chapter, focus is placed on providing an understanding of the study context. This chapter, therefore, emanates from a broad context to discuss the definition of entrepreneurship and its importance. The chapter continues to discuss the application of the student self-employment in different parts of the world before eventually zooming to the South African context which is the primary focus of the current study. Also, in this chapter challenges facing student entrepreneurship will be discussed to add to the justification of the study. Figure 1.1 provides an outline of the chapter.

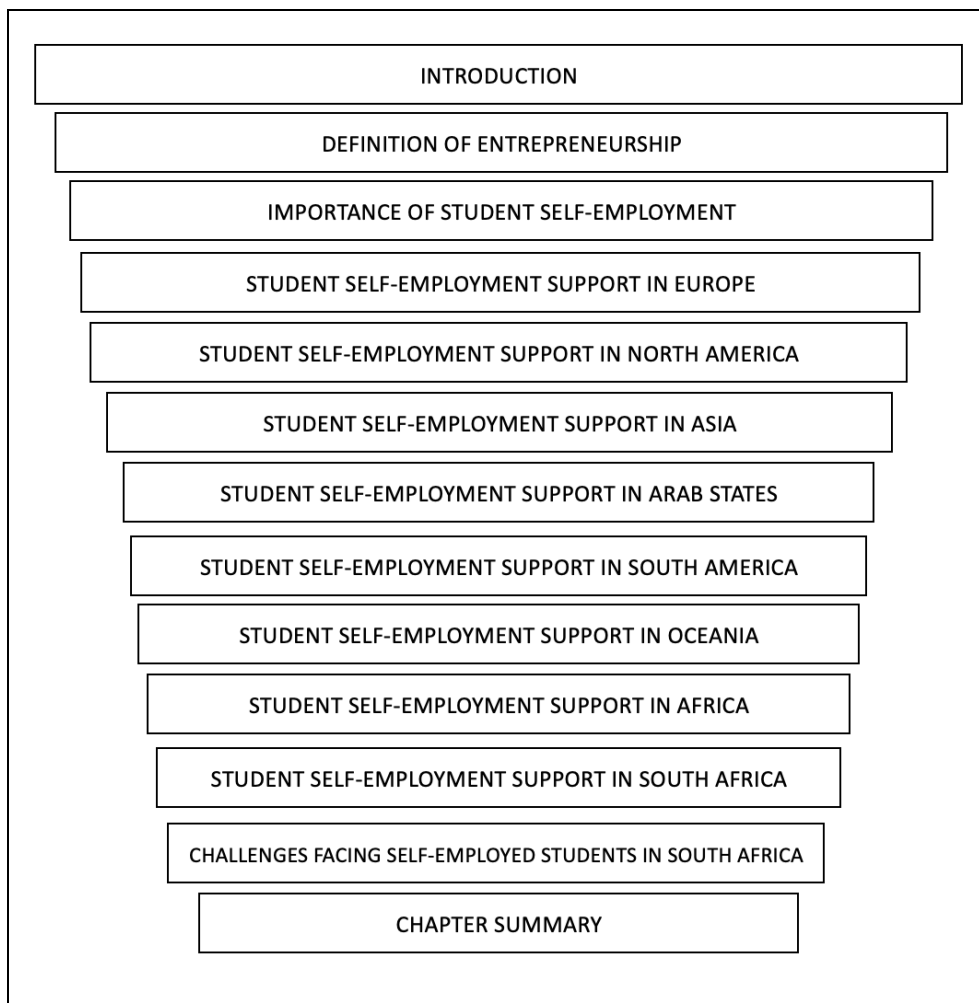


Figure 2.1 Chapter outline

Source: Researcher's own construction

2.2 Introduction

The global unemployment rate is estimated to be between 6.3 per cent and 6.5 per cent (World Population Review, 2023). The biggest contributors to the global unemployment rate are developing regions. South Africa is positioned at number one in the world with its current unemployment level at 32.9 per cent in the first quarter of 2023 (Stats SA, 2023). Unemployment has become a persistent problem in South Africa for the last 32 years (Macrotrends, 2023). Evidence from Macrotrends (2023) showed that unemployment in South Africa was at 29.96 per cent in 1991, 29.89 per cent in 1995, 29.88 per cent in 2000, 29.12 per cent in 2005, 24.68 per cent in 2010, 25.15 per cent in 2015 and 29.22 per cent in 2020. This is evidence of a persisting unemployment problem. Unemployment in South Africa is not only affecting the general public but also graduates. Graduate unemployment was recorded at 10.6 per cent in the first quarter of 2023 (Businesstech, 2023). This is a sharp increase of 5.1 per cent in graduate unemployment from 5.1 per cent in the first quarter of 2013. The skyrocketing unemployment among graduates in South Africa is concerning.

Unemployment in South Africa, especially, among graduates, requires urgent attention. With unemployment comes socio-economic problems (Wakefield et al., 2022). Such socio-economic problems include a decrease in household income, reduction in the standard of living, rise in poverty and crime. It is, therefore, important for policymakers to prioritise a discussion on solutions to eradicate unemployment within their agenda points. According to Ayalew and Zeleke (2018) and Jena (2020), developed countries make use of student entrepreneurship as one of the mechanisms to stimulate employment. Student entrepreneurship is a recommended strategy to boost economic growth and increase employment opportunities. Researchers have indicated that student self-employment is synonymous with entrepreneurship (Osmani et al., 2019; Wadho et al., 2019).

Developed countries provide a supportive environment for entrepreneurship to make student self-employment thrive (Gachie, 2020; Fidanoski et al., 2022). However, this is a different scenario for South Africa as noted by GEM (2023). South Africa is ranked number 45 out of 50 countries in the GEM (2023) National Entrepreneurial Context Index. A lack of a supportive entrepreneurship environment has the potential to discourage student self-employment. Based on this argument it is important for policymakers across different sectors in South Africa - government, universities and private sector - to join forces in finding solutions towards promoting student self-employment. Since it has been argued that student self-employment is synonymous with entrepreneurship, this chapter includes a discussion on entrepreneurship. The definition of entrepreneurship is discussed next.

2.3 Definition of entrepreneurship

The definition of entrepreneurship attracts wide attention from multitudes of researchers across the world (Uddin and Bose, 2012; Oluseye, Adebayo, Olulanu, Adesola and Omonike, 2017; Alonso and Kok, 2021). The wide attention given to the definition of entrepreneurship shows its importance. Entrepreneurship is defined as an independent and risk-taking behaviour that leads to the accumulation of future benefits (Parker, 2004). According to Uddin and Bose (2012), entrepreneurship is the practice of starting a new business to offer an innovation that has business potential. Bacigalupo, Kampylis, Punie and Van den Brande (2016) indicated that entrepreneurship is a competence that enables people to participate in all spheres of life, for example, entering or re-entering the job market, self-employment or starting a new venture. Oluseye et al. (2017) argued that entrepreneurship involves the identification of opportunities and the allocation of resources to create value that will serve unmet needs. Ojiaku, Nkamnebe and Nwaizugbo (2018) defined entrepreneurship as an attempt to establish a new business or expansion of an existing business by an individual, group of individuals or an organisation. Alonso and Kok (2021) posited that entrepreneurship is a process through which individuals, organisations, societies and regions pursue opportunities to create wealth. Alonso, Kok, O'Brien and Geneste (2020) pointed out that entrepreneurship involves the identification and evaluation of opportunities.

It should be realised that the aforementioned definitions have been presented in a time series manner to understand how the concept of entrepreneurship has evolved. The definition presented by Park (2004) highlights the significance of independence and risk-taking behaviour for successful entrepreneurship leading to the accumulation of future benefits. This makes one realise the importance of entrepreneurial competencies - independence and risk-taking - for successful entrepreneurship. Uddin and Bose (2012) identified innovation and business potential as the two aspects behind entrepreneurship. From their point of view, successful entrepreneurs are able to identify innovative ideas that can make business sense. Bacigalupo et al. (2016) regarded entrepreneurship as a life skill competence that enables one to handle day-to-day life. Oluseye et al. (2017)'s definition is built around four aspects, which include opportunity identification, resource allocation, value creation and satisfying unmet needs. The definition presented by Oluseye et al. (2017) is similar to that of Uddin and Bose (2012) in the sense that value creation can be equated to innovation. Ojiaku et al. (2018) linked entrepreneurship to five elements that include a new business, an established business, an individual, a group of individuals and an organisation. This definition shows that entrepreneurship does not only include starting a new business but also the expansion of one that is existing (Ojiaku et al., 2018). Also, coming from this definition is that entrepreneurship can be carried out by either an individual, a group of individuals or an organisation. According to Alonso and

Kok (2021) there are six elements, namely individuals, organisations, societies and regions that pursue opportunities to create wealth. The definitions by Alonso and Kok (2021) and Ojiaku et al. (2018) are similar in the sense that they both indicate that entrepreneurship is stimulated by individuals and organisations. However, their definitions also differ in the sense that while Ojiaku et al. (2018) further referred to a group of individuals as responsible for stimulating entrepreneurship, Alonso and Kok (2021) suggested that societies and regions should also be involved.

The analysis of the definitions shows that there has been growth in the manner in which entrepreneurship is perceived. The recent school of thought argued that there should be an involvement of individuals, groups of individuals, organisations, societies and regions for entrepreneurship to be successful (Gachie, 2020; Fidanowski, 2022). When looking at the different definitions, this study, therefore, defined entrepreneurship as a process through which individuals (i.e., students), groups of students, organisations, societies and regions apply competencies (i.e., independence and risk-taking) to identify opportunities, create innovation and serve unmet needs to create wealth. The next section discusses the importance of student self-employment.

2.4 Importance of student self-employment

Student entrepreneurship and self-employment should be embraced due to the numerous benefits that are born out of it. Several researchers have presented evidence on the importance of student entrepreneurship and self-employment over the years (Davey, Hannon and Penaluna, 2016; Ojiaku et al., 2018; Jena, 2020). The importance of student entrepreneurship has been listed to include venture start-ups, increased productivity, rise in competitiveness, wealth creation, job creation, increased quality of life, and economic prosperity (European Commission, 2006; Ayalew and Zeleke, 2018).

2.4.1 Venture start-up

Section 2.3 has shown that entrepreneurship is a competence that assists one to establish a business (Bacigalupo et al., 2016). Consequently, an entrepreneurial mindset allows an individual or a group of individuals, for example students, to start a venture. Ayalew and Zeleke (2018) articulated that the encouragement of entrepreneurship among students leads to the establishment of venture start-ups and self-employment. Thus, a culture of entrepreneurship makes students get involved in venture start-ups and not rely on the job market. Over-reliance on the job market creates pressure on economic policymakers. It is for this reason that action needs to be taken to ensure that sufficient initiatives and support are put in place to encourage self-employment among students.

2.4.2 Increased productivity

One of the definitions provided by Ojiaku et al. (2018) in section 2.3 indicates that entrepreneurship is not only about starting a new venture but also expanding an existing one. Hence, entrepreneurship should be credited for fostering the expansion of existing businesses. Students, therefore, require entrepreneurship skills to expand their ventures. According to Jena (2020), most performing countries across the world are recognising entrepreneurship as a strategy for increasing productivity within existing start-ups. Parker (2004) pointed out that entrepreneurship is about independence and risk-taking. Thus, students with an entrepreneurial mindset find themselves in a position to increase productivity within their ventures due to special qualities such as risk-taking and independence behaviour, as pointed out by Parker (2004). This study argued for the promotion of entrepreneurship among university students since it leads to increased productivity.

2.4.3 Rise in competitiveness

As students venture into entrepreneurship and self-employment, it should be understood that they will be operating in a highly competitive environment. Entrepreneurial skills are, therefore, required for students to create competitiveness. Uddin and Bose (2012) argued that entrepreneurship allows students to develop innovativeness in their operations. It should also be noted that innovativeness is a currency for competitiveness. Jena (2020) also confirmed that entrepreneurship is required for businesses to achieve competitiveness. Without such competitiveness, self-employed students will not be able to survive in a market with numerous challenges. It is for this reason that different stakeholders, such as universities, private and government, provide the much-needed initiatives and support for self-employed students to thrive.

2.4.4 Wealth creation

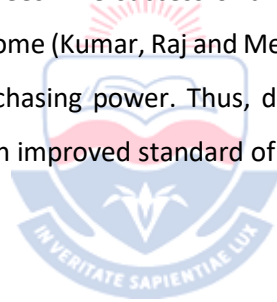
Entrepreneurship leads to the creation of value in the form of an increase in income and profits. Lackéus (2020) heralded entrepreneurship as a mechanism to create value for oneself and the society. Entrepreneurial skills enable students to increase productivity and competitiveness (OECD, 2006, Gallup Organisation, 2007; Jena, 2020). Productivity and competitiveness result in wealth creation due to the increase in output. Thus, self-employed students will be in a position to increase income through entrepreneurial ventures. The increase in income through student self-employment leads to a rise in wealth (Holloway and Pimlott-Wilson, 2021). Entrepreneurship leads to the creation of wealth among self-employed students. This, therefore, mean that policymakers (universities, industry and government) need to focus their attention on finding ways to improve student entrepreneurship.

2.4.5 Job creation

One of the benefits of student entrepreneurship is the creation of jobs as pointed out by several authors (Ojiaku et al., 2018; Jena, 2020). The creation of wealth translates to the expansion of business operations. As business operations expand, the need for additional human resources emerges naturally. This natural occurrence as a result of business expansion leads to job creation. It should be noted that student self-employment needs to be encouraged as it adds to employment creation. Zahra (1991), European Commission (2006) and Hahn, Minola, Bosio and Cassia (2020) affirmed that entrepreneurship is a panacea for youth unemployment. Policymakers need to consistently promote entrepreneurship given its benefits to job creation.

2.4.6 Increased quality of life

From both research and a practical point of view, it is important to understand that entrepreneurship increases people's quality of life. Researchers have shown evidence that entrepreneurship, including student self-employment, increases business income (Ayalew and Zeleke, 2018). The increase in business income also benefits employees. The success of the business venture benefits employees through their increased disposable income (Kumar, Raj and Mehta 2023). Increased disposable income provides employees with decent purchasing power. Thus, decent purchasing power is required to improve people's standard of living. An improved standard of living translates to an increased quality of life.



2.4.7 General economic prosperity

A high entrepreneurship level in the country leads to economic prosperity (Cardella, Hernández-Sánchez and Sánchez-García 2020). Apart from creating employment, businesses also pay taxes to the government. Taxes add to the fiscus of the government. An increase in the government fiscus is required for community development (Gallup Organisation, 2007). Thus, an increased government fiscus increases the capacity of the government to deliver public services, such as electricity, water, education, health, and transportation. It is based on this reason that student self-employment should be encouraged. The increase in the number of student entrepreneurial establishments should be desired since it leads to an increase in the government fiscus. However, it should be noted that despite the benefits of entrepreneurship, students still encounter numerous challenges in their self-employment endeavours. The next section presents student self-employment across the world.

2.5 Student self-employment development across the world

This section aims at providing a picture of the state of entrepreneurship and student self-employment across the world. Hence, different parts of the world will be discussed, including Europe, North America, Asia, Arab States, South America, Oceania and Africa. The current section provides an understanding of the variations of entrepreneurship policies and how they affect self-employed students across the world. Audretsch, Colombelli, Grilli, Minola and Rasmussen (2020) indicated that there is heterogeneity in the manner in which different parts of the world implement entrepreneurship policies. The Arab states and Northern Africa reached a share of 20 per cent in terms of the implementation of student entrepreneurship policies. In the Caribbean, Latin America and sub-Saharan Africa made substantial progress with a 40 per cent implementation of entrepreneurial policies by 1990, while reaching a remarkable 70 per cent by 2011. Also, quite involved in the implementation of student entrepreneurship policies in the Asia and Pacific region with a record 50 per cent by 2011 (Weidenkaff and Witte, 2023). Table 2.1 illustrates policy documents focusing on youth enterprise development by country income status.

Table 2.1 Policy documents focusing on youth enterprise development by country income status

Information on youth enterprise development	Country income status		
	High income	Lower and middle income	Total
Total number of policy documents on youth entrepreneurship	193	292	485
Number of countries	22	43	65
Enterprise development (n = documents)	50	123	173
Share of overall policies (%)	26	42	36
Number of countries	17	39	56
Access to non-financial services (%)	52	60	58
Access to finance (%)	44	71	54
Measures for enterprise start-ups by young people (such as tax rebates, subsidies, registrations) (%)	66	43	50
Measures to promote registration and compliance of existing enterprises in the informal economy (%)	4	6	5
Other self-employment and enterprise development measures for students (%)	30	59	51

Source: Weidenkaff and Witte (2023)

As already indicated, Table 2.1 shows a variation in the number of student entrepreneurship policies implemented between high-income and lower- to middle-income countries (Weidenkaff and Witte, 2023). At least 193 policy documents are linked to 22 high-income countries, while 292 are traced to lower to middle-income countries. A country-to-policy ratio shows that high-income countries have

implemented more policies than their lower- to middle-income counterparts (Gomez, Ferreria and Lopes, 2023). However, in terms of enterprise development, the statistics show that lower- to middle-income countries have had a higher development rate (Weidenkaff and Witte, 2023).

In terms of access to non-financial services, Weidenkaff and Witte (2023) reported that high-income countries had a 52 per cent access rate, while lower- to the middle-income countries had 60 per cent. Non-financial services would include aspects such as skills provision and physical resources. These also include interventions by the private, financial, and business support service providers (Siegerink, Shinwell and Žarnic, 2022). Interventions by these institutions would include a focus on entrepreneurship training such as access to knowledge and skills development. Further intervention includes advisory services, mentoring and coaching to facilitate access to markets, value chains and networks (Sohail, Belitski and Christiansen, 2023).

Regarding access to finance, high-income countries had an overall rate of 44 per cent, while lower to middle income countries had 71 per cent. Access to finance is facilitated through credit, monetary and in-kind grants (Siba, 2019). However, high-income countries had higher measures for enterprises started by young people than lower- to middle-income countries. These measures for enterprise start-ups included tax rebates, subsidies and registrations. Regarding measures to promote enterprise registration and compliance in the informal economy, lower- to middle-income countries had a higher rate than high-income countries (Kaplinsky and Kraemer-Mbula, 2022). Low- to middle-income countries also had higher support in terms of other self-employment and enterprise development measures. This section generally shows a commitment from both high- and lower- to middle-income countries in terms of their support of student entrepreneurship. Global employment trends show that there had been a steady increase in the number of people employed in the world. However, the distribution of self-employment significantly differed from one region to the other, as shown in Figure 2.2.

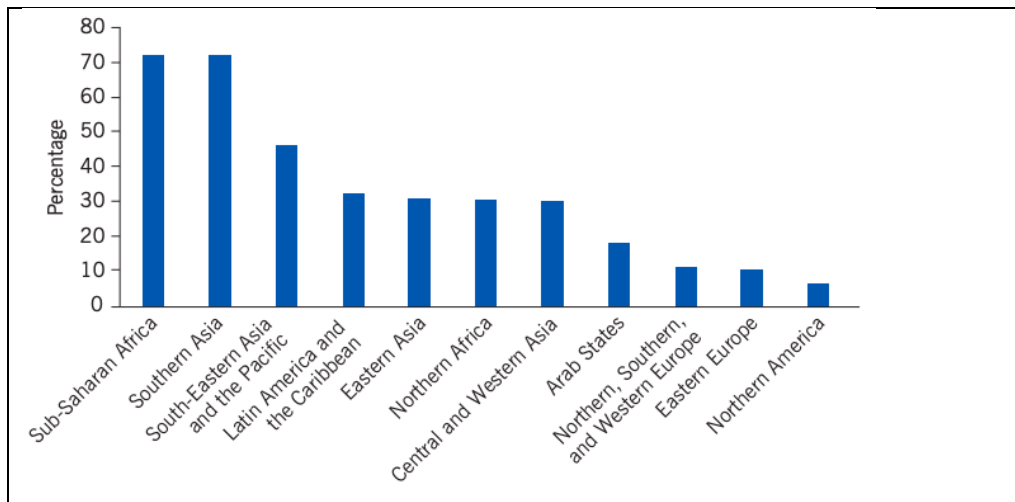


Figure 2.2 Self-employment distribution by region in 2018

Source: Raphael (2020)

The distribution of self-employment by region indicates that sub-Saharan Africa and South-Eastern Asia had the highest rate of self-employment (Raphael, 2020). These regions are followed by Latin America and the Caribbean. The Caribbean and Latin America are followed by Northern Africa, the Arab States, Northern, Southern, and Western Europe, and Northern America (Eurostat, 2019; Weidenkaff and White, 2023). The scenario in Figure 2.2 is an indication that lower- and middle-income countries rely heavily on self-employment. This can also be because their economies are not so heavily industrialised. The next section provides a closer look at student entrepreneurship development in Europe.

2.5.1 Student self-employment support in Europe

Europe has been at the forefront of youth entrepreneurship development as indicated by numerous researchers, which include Pan, Hung, and Lu (2010), Prokop and Stejskal (2017) and Anderson and Stejskal (2019). Evidence from research indicates that Germany and Switzerland are more advanced in terms of innovative solutions towards the promotion of student self-employment. On the other hand, the United Kingdom, Hungary and Denmark were found to have a lower score on innovative policies towards student self-employment (Anderson and Stejskal, 2019). However, a higher innovation score does not necessarily translate to a higher innovation diffusion rate. This applies to Sweden, which ranks high on the innovative scale; however, with the lowest efficiency level. A different story applies to Bulgaria and Romania, which have a compromised innovation level but with high efficiency levels. Countries need to balance innovation and efficiency levels to have successful student self-employment programmes.

Another point raised by Prokop and Stejskal (2017) is that some European countries struggle to become effective knowledge economies. Thus, they fail to drive student self-employment through the

use of the knowledge economy due to the approach they have adopted in the process. More often than not, these European countries slack right from knowledge creation, use, dissemination and commercialisation (Pan et al., 2010). Consequently, when creation has not been streamlined to deliver its intended purpose, the outcome is usually far from the desirable state. Knowledge institutions, for example universities, are put in the forefront. However, their effectiveness in knowledge creation depends on the entrepreneurial-informed curriculum. Also, the use of knowledge is another level through which problems are generated. Of course, the saying “if it is not created with the rightful purpose, it will not see the day of light” becomes a reality. The dissemination of knowledge requires effective delivery. The right platforms need to be used so that the message reaches the intended recipients. Despite challenges encountered in some parts of Europe, there is also a lot of good to write about regarding progress made in that part of the world. Eurostat (2019) indicated that at least 32.6 million people within the age group 15 to 74 were self-employed in 2018. It is also indicated that at least 750 000 people in the United Kingdom were self-employed by 2014 (Raphael, 2020). Within these ratios, there is a great portion of self-employed students.

In Germany, a few examples can be cited where initiatives were taken to boost student self-employment. According to Van Widen (2015), the InnovationLab founded in 2011 is one of the examples where 3H Partners joined forces to find solutions to drive a knowledge economy. In this arrangement, at least 100 scientists from universities collaborated with the industry to develop solutions for printed and organic electronics (InnovationLab, 2022). For this arrangement to become a reality, the Metropole region Rhein-Neckar played the facilitating role to bring together involved universities in Heidelberg and Mannheim and the industry (i.e., Merck and BASF) in this cooperation. A total of €40 million was provided by the regional government to ensure that this cooperation is boosted. This cooperation, otherwise called a cluster, was established to benefit participating companies in the field of printed and organic electronics. The platform was also meant to benefit self-employed students providing services in printed and organic electronics. The cooperation by the 3H Partners is different from what is taking place in Central and Southern Europe where cooperation between university education is theoretical with little impact on the industry (Ćudić, Alešnik, and Hazemali, 2022). This is caused by non-cooperation between universities and the industry. As a result of this non-cooperation, the development of entrepreneurial solutions that benefit self-employed students becomes minimum.

In Southeastern Europe, the initiatives to propel a knowledge economy are evidenced by the measures taken in Romania. To create a conducive environment where self-employed students could benefit from the spillovers, universities teamed up with eight organisations. Among these organisations were the regional development agency, the City of Cluj-Napoca and the county-level institutions in Cluj (Van

Widen, 2015). The purpose of this cooperation was to create a platform that develops solutions, such as internships and curriculum development, to boost entrepreneurial endeavours that benefit young people, including self-employed students.

In Spain, the government established financing schemes to boost entrepreneurial activities within the country. Bertoni, Marti and Reverte (2018) stated that long-term financing was made available for entrepreneurial ventures including those associated with student self-employment. The long-term financing schemes included subsidies for research and development, subsidised loans, loan guarantees and government-supported equity (Cumming, Sapienza, Siegel, and Wright, 2009; Colombo, Cumming, and Vismara, 2016). The Empresa Nacional de Innovación (ENISA) which is a government agency funded by the Spanish Ministry of Economy, industry and Competitiveness is responsible for providing financial assistance to entrepreneurial ventures in Spain (Infelise, 2014; Karhunen and Huovari, 2015). ENISA only assists SMEs, but with special conditions that they must not be operating in real estate or financial services. This is an opportunity provided to self-employed students to secure finance. However, obtaining finance is not automatic since applicants should go through a rigorous screening process where almost half of the applications are rejected (Agliata, Ferrone and Tuccillo, 2014; Marti and Quas, 2018). Therefore, self-employed students must ensure that their applications are strengthened through the submission of sound business proposals to receive financial aid.

In Scandinavia, the approach is linked towards the cooperation of universities, industry and the government (Lerman, Gerstlberger, Lima, and Frank, 2021). This approach is regarded as the triple helix model since it involves the cooperation of the three major stakeholders in society. However, this chapter does not dwell much on the triple helix model since it is reserved for Chapter 3 where key theories of the study will be discussed. The implementation of this approach was made prominent in Stockholm, Helsinki and Copenhagen (Sølesvik, 2017). Through this approach, these regions became highly innovative to the extent of becoming innovative leaders of the European Regional Scoreboard.

The Kemerovo region of Russia attempted to apply a triple helix model to boost economic prosperity. However, economic interventions in this region were hampered for several reasons. These reasons include a shortage of manpower to participate in research and development (Burroni, Gherardini, and Scalise, 2019). It is due to this manpower incapacitation that the region could not produce so innovative ideas. Without innovative ideas, the region further suffered from diminished intellectual property (Huggins, Prokop and Thompson, 2020). As intellectual property declines, entrepreneurial ideas also decrease, leading to a dwindling commercial activity. Kalenov and Shavina (2018) argued that the lack of entrepreneurial performance in this region has been caused by a non-supportive

federal government. This situation also translates to a non-supportive environment towards self-employed students.

2.5.2 Student self-employment support in North America

In the North American region, efforts presented by Mexico are remarkable. Such efforts are seen in the Chihuahua region where a robust business ecosystem was developed (Cruz, 2020). This business ecosystem included an investment in the triple helix model to set structures that propel economic development. Villegas Mateos (2019) stipulated that the business ecosystem in the Chihuahua region established facilities such as business incubators and science parks. This establishment was carefully created to match the competencies of universities, industry, and government. Apart from the efforts made in the Chihuahua region, another region that applied the triple helix model was the State of Jalisco (Porto-Gomez, Zabala-Iturriagagoitia, and Leydesdorff, 2019). In the State of Jalisco, investments have been directed to build innovation, science, and technology. Innovative ideas coming out of these investments were also expected to benefit entrepreneurs including self-employed students. To strengthen this endeavour, a council was formulated to govern the model and ensure that the curriculum and programmes are created in line with market needs. Such market needs also included skills set requirements of self-employed students, especially those participating in the agricultural and technology industry. Apart from its efforts within the country, Mexico also got involved in a bilateral relationship with Japan to boost economic cooperation. Consequently, through the University of Hiroshima and the Mexican Agency for International Cooperation for Development, economic and entrepreneurial cooperation agreements were put in place (Didou Aupetit, 2019). Strengthening of this cooperation was also facilitated through the Mexico-Japan Rectors' Summit which has already taken place four times since 2016. The purpose of this Summit is to create a dialogue among major stakeholders of society, including universities, industry and government. Despite the progress that has been registered so far, Mexico still needs to do a lot of work to build effectiveness and efficiency. This would help to reimage Mexico as a world leader within the productive sector by ensuring that the required tools and human and natural resources are put in place for good use. To achieve this, Mexico would need to fully engage its universities, industry and government such that their commitment becomes synchronised towards the development of entrepreneurship and self-employed students.

The United States also has an organised and thriving ecosystem based on the triple helix model. Etzkowitz and Dzisah (2013) indicated that science and technology in the United States hinged on cooperation among universities, national government, local government, and the industry. This approach resembles a full-fledged triple helix model approach. This cooperation is strengthened

through the provision of funds aimed at boosting major economic sectors of the country. One of the major financial initiatives took place before the Second World War when federal research funds were injected in support of agricultural research (Casula, 2022). Funds were also made available on an ongoing basis after the Second World War to support both military and civilian entrepreneurial activities. This support, especially those aimed at civilian purposes, benefited self-employed students. Suchek, Ferreira and Fernandes (2022) stipulated that university-industry-government cooperation has assisted to provide a conducive environment for entrepreneurship development. The United States universities have become known for their commitment in support of entrepreneurship. Hence, this commitment has made these universities among the top performers in terms of providing entrepreneurship education and entrepreneurial support for their students. This has inspired students to become entrepreneurs such that the number of self-employed students increased tremendously.

The Canadian story is also one that is desirable with students playing their role in providing solutions for economic development. At the University of Calgary, students pursuing engineering made use of technology to develop solutions for socio-economic development (Gates, Wang, Kannaiyan and Su, 2021). Such solutions came through inventions that were suitable for patents and intellectual property. What is also important to note in this achievement among engineering students at the University of Calgary is the commitment of different stakeholders within the country (Chang, 2016). Such stakeholders included universities, industry, and government. Joining their forces, the triple helix model players were able to provide support to university students to thrive in entrepreneurship efforts and provide solutions to benefit society.

This section has shown that the North American region is quite advanced in the way they approach support for entrepreneurship programmes. Thus, all the countries in this region - Mexico, the United States, and Canada -are committed to the promotion of an entrepreneurship environment. This has, therefore, assisted the North American region to emerge victorious in its effort to present students with entrepreneurship efforts. Consequently, student self-employment thrives in this environment due to the nature of the entrepreneurship support provided.

2.5.3 Student self-employment support in Asia

While the application of the triple helix model started in the 1980s and 1990s in Europe, in China it can be traced back to the 1970s. Wang and Zhou (2008) and Xue and Zhou (2011) argued that the Chinese began applying the triple helix model at the end of the 1970s when economic reforms were initiated. Not only did China initiate economic reforms but also adopted the open-door policy. The triple helix model was also reflected in the national medium- and long-term programme for science and technology (2006 - 2020) (Kang, Zhao, Song and Zhuang, 2019). The facilitation of the triple helix

model in China is done through knowledge production by universities and research institutes. Between the period 1950 and 1970, research has been mandated to research institutes only while universities were performing the sole responsibility of teaching. This system was heavily influenced by the Soviet Union and based on a complex research institute (Zhang, Zhou, Porter, Gomila and Yan, 2013). One of the notable research institutes established by the Chinese to stimulate entrepreneurship innovation is the Chinese Academy for Sciences. In recent times, the Chinese have revitalised research on entrepreneurial innovation by reorganising the structure of higher education institutions. Thus, higher education institutions were reorganised according to their area of specialisation to allow innovation to come from different fields. It must also be noted that the restructuring of the Chinese systems was greatly influenced by the United States whose emphasis on the development of comprehensive university research is unmatched. The Chinese innovation system became a network that comprises universities, research institutes, industry and government (Liua and Huang, 2018; Li, He and Zhao, 2019). However, according to authors such as Liu, Gorgievski, Qi and Paas (2022), the cultivation of entrepreneurship education in Chinese higher education institutions is still in its infancy. While this is the case, it should be acknowledged that remarkable effort is being invested to stimulate an entrepreneurship spirit within students. Also, the government have established support for student entrepreneurs (An and Xu, 2021). The Chinese authorities have started to integrate innovative entrepreneurship concepts with the university curriculum. Besides the effort to streamline university education in line with entrepreneurial requirements, different forms of support have been invested to assist self-employed students to thrive. Despite the efforts invested by the Chinese higher education authorities to assist entrepreneurial students, the entrepreneurship rate has remained lower than its counterparts in developed countries in the West (Li and Zeng, 2018; Su et al., 2021). The rate at which students start a business six months after graduation was only higher in the Pan-Yantze River Delta region than in other Chinese areas between 2014 and 2016 (Lv, Chen, Shav, Wang, An, Chen, Huang, Huang and Huang, 2021). To fight this lower entrepreneurship rate in China, there has been an agenda to promote entrepreneurial infrastructure for social progress in the national government (Ministry of Education of the People's Republic of China, 2019).

Investments to promote student self-employment have not been done in China alone but also in other parts of Asia, including Thailand. The move to promote entrepreneurship among students was instigated by the middle-income trap that faced Thailand for many years (Rajchamaha and Papojanasomboon, 2021). This situation has been perpetuated by the high labour cost that led to the loss of Thailand's competitive advantage. It is, therefore, due to this high labour cost that most businesses were discouraged from pursuing investment activities (Buasuwan, 2018). To return the country's competitiveness, the government established reforms to revitalise entrepreneurial progress.

Consequently, the government spearheaded an entrepreneurship movement known as Thailand 4.0 to focus on technological development and innovation. Thailand 4.0 was meant to improve the technological and innovation development of SMEs since they are considered the engines of economic development (Potjanajaruwit, 2019). Self-employed students were included in this entrepreneurial policy since they are in the SME bracket. The Thai government established measures that included tax incentives, investment funds and ecosystem development to benefit SMEs (i.e., self-employed students) (Wisuttisak, 2020). In addition to these programmes, the entrepreneurship education programme was also put in place as part of the strategic national policies to boost student entrepreneurship (Amalia and Von Korflesch, 2021). It is from this initiative that the curriculum at universities and vocational schools was restructured to accommodate entrepreneurship education. According to Hidayat and Yunus (2019), the curriculum was transformed in line with entrepreneurship to include entrepreneurship lectures, special projects, project contests and internships.

In Malaysia, the move to promote entrepreneurship was facilitated through the intervention of the higher education curriculum. Zamberi (2013) posited that entrepreneurship elements were integrated into the curriculum at universities. The Malaysian government has shown its commitment to restructure the university education curriculum for two decades. This tremendous transformation was initiated through the Malaysian Education Blueprint 2015-2025, which was put into action on 7 April 2015 (Ramalu, Nadarajah and Aremu, 2020). This became the national strategy to reposition Malaysia's education system to become competitive in the world. The focal point of the Malaysian Blueprint 2015-2025 was to produce well-rounded and balanced graduate entrepreneurs. Apart from the Blueprint, the Malaysian Higher Education Ministry launched the higher education institution entrepreneur action plan 2016-2020 to further develop entrepreneurship education in Malaysian higher education institutions (Hassan, Sade and Rahman, 2020). This was done with the hope that this would encourage student self-employment in Malaysia since it is the engine for economic development. However, despite the efforts to revitalise the Malaysian education curriculum to become competitive, the growth of entrepreneurship activity is still compromised. According to Al-Jubari and Mosbah (2021) and Shah, Abd, Hamid and Yazib (2023), entrepreneurship motivation in Malaysia is still lower than its counterparts in the GEM. It is argued that the major drawback of Malaysian entrepreneurial intervention is a lack of clear pedagogical guidelines. The responsibility to integrate entrepreneurship into the curriculum is left on the shoulders of teachers. On the other hand, teachers find it hard to coordinate their teaching with entrepreneurship education (Ahmad and Xavier, 2012; Ramalu et al., 2020). Also, what has been cited as one of the problems facing Malaysian progress towards integrating entrepreneurship education into the curriculum is the lack of financial support, bureaucracy, and inconsistencies in government policies.

There has been huge progress in the Vietnamese structure aimed at improving entrepreneurship among self-employed students. Nguyen, Van, Bartolacci and Tran (2018) revealed that several acts of parliament were put in place to encourage entrepreneurship within Vietnam. One of the acts included number 193/2001/QD/-TTG, which was issued by the prime minister on 20 December 2001. This was issued to promote the establishment and operation of SMEs in Vietnam. This act also promoted the issuance of credit guarantees to SMEs. This was an incredible move by the prime minister in Vietnam to promote entrepreneurship, including self-employment, as direct support was invested. Apart from the 193/2001/QD/-TTG, another act includes circular number 86/2002/TT-BTC, which was issued on 27 September 2002 by the minister of finance (Le, 2011). Circular number 86/2002/TT-BTC was issued to provide a guideline for the use of a budget for the support of trade and export promotional activities. In essence, the act was meant to support the export trading of SMEs so that they get exposure to the international market. This act established an opportunity for self-employed students to take their trade beyond the Vietnamese borders. In 2003, another act was put into place as number 12/2003/QD-TTG. This act was established by the prime minister on 17 January 2003 to further provide support to SMEs through the Small and Medium Enterprises Development Promotion Council (Nguyen et al., 2018). Consequently, the prime minister promulgated the 12/2003/QD-TTG to create guidelines on the functions, responsibilities, and membership of the Small and Medium Enterprises Development Promotion Council (Do and Pham, n.d.). The Vietnamese government needed to ensure that SMEs, including self-employed students, receive entrepreneurship support to stimulate their activities. However, the action of the government without the inclusion of universities and the industry is not sufficient. The Vietnamese government requires university initiatives and industry support to strengthen its efforts towards the establishment of a supportive entrepreneurship environment for self-employed students and SMEs in general.

In Jakarta, the initiative to promote entrepreneurship was formulated through governor regulation number 102 of 2018 (Wijaya and Nuringsih, 2021). This initiative was aimed at promoting women entrepreneurship and beginner entrepreneurs such as self-employed students in Jakarta (Chen and Basbeth, 2020). Consequently, it became known as Jakpreneur. The Jakpreneur established a membership of 111 108 micro small and medium enterprises (MSMEs) in 2019 (Malebana, 2014). As already indicated, this membership included self-employed students who benefited from the provision of training and mentorship on entrepreneurship skills (Gayati, 2021). Training and mentorship within the Jakpreneur included the facilitation of financial reporting (Prawesti, Sonia, and Lindawati, 2023). Also, included in this training was an understanding of different sources of finance, for example, equity and debt finance. The Jakpreneur was further enhanced through the inclusion of various other interested stakeholders, for example, the industry and universities (Wijaya and Nuringsih, 2022).

These were included to contribute their expertise in the development of self-employed students. Jakpreneur's membership increased to 260 000 MSMEs by July 2021 as a result of the support provided (Wiguna, 2021). The support for the Jakpreneur further increased to include training and skills development, assistance on halal certification, intellectual property rights, and marketing (Yuhendra, Adi and Rahayu, 2022).

The Indian entrepreneurship drive was stimulated by the inability of the government to employ the growing population (Jena, 2020). To deal with the growing unemployed population, two flagship programmes were started in India. These flagship programmes were known as Start-up India and Stand-up India (Khuntia and Mishra, 2019). Start-up India was put in place to encourage the establishment of start-ups in India (Chellappa, Kumar and Ahmed, 2022). Thus, citizens were encouraged to set up businesses so that they could be self-employed. The focus of this initiative was that of encouraging students to become self-employed. While Start-up India focused on providing support to encourage the establishment of businesses, Stand-up India was put in place to stimulate support for already established businesses (Shivakumar, 2020). Support was provided to young Indians to become entrepreneurial through training and skills development. Apart from training and skills development, money and technical support were also provided to boost the entrepreneurship of young Indians (Agarwal, Ramadani, Gerguri-Rashiti, Agrawal and Dixit, 2020). Entrepreneurship initiative in India was further boosted by the industry-academic partnership that set up incubation programmes to develop self-employed students (Singh and Sagar, 2021).

Pakistan is also one of the countries in Asia that showed its commitment to developing student self-employment (Tunio, Chaudhry, Shaikh, Jariko and Brahmi, 2021). According to Saeed et al. (2015), this was regarded as crucial for the economic growth of Pakistan. To stimulate economic growth through student self-employment, Pakistan formulated educational policies that were streamlined to address the entrepreneurial requirements of the curriculum (Yuan, Wang, Mao and Wu, 2020). Nadeem, Javed and Abbas (2019) further indicated that the Higher Education Commission of Pakistan established the National Business Education Accreditation Council (NBEAC) to facilitate business education. Therefore, it became the mandate of the NBEAC to ensure that the education curriculum was business-orientated. Making the curriculum businessorientated was also important due to the need to stimulate entrepreneurship among students at Pakistan universities (Tanveer, Ali and Haq, 2021). The NBEAC introduced entrepreneurship as an elective module within the final year of undergraduate programmes in Pakistan (Saeed, Muffatto and Yousafzai, 2014). However, the effort to stimulate entrepreneurship in Pakistan seemed to be driven by the government and universities without any commitment from the industry. A balanced effort needs to be driven by all important stakeholders of society, which include universities, government, and industry.

2.5.4 Student self-employment support in the Arab States

The Arab States were under pressure to employ their university graduates. Exacerbating this pressure was the growing number of graduates, while labour market opportunities were declining (Reyad, Badawi and Hamdan, 2018). Hidayat and Al-Hadrami (2015) articulated that the decline in oil prices also contributed to the loss of competitiveness within the Arab States. To deal with this mounting pressure, Arab States turned to the production and the use of indigenous knowledge to foster critical thinking. Also, the government in these states resorted to the transformation of the higher education system to promote student self-employment (Badawi, Reyad, Khamis, Hamdan and Alsartawi, 2019). The transformation of the higher education system was carried out through the inclusion of entrepreneurship education within the business programme curriculum (Mendez, Galindo and Soriano, 2012). Hence, students pursuing business programmes received entrepreneurship training and skills development. With these skills, students were encouraged to start business ventures. Hidayat and Al-Hadrami (2015) discerned that the inclusion of entrepreneurship in the curriculum assisted in alleviating unemployment pressure. Also, these states understood that competition on the global stage is achieved through entrepreneurship and student self-employment.

The Kingdom of Saudi Arabia (KSA) is not unique in the unemployment problems facing the Arab States. Al-Mamary and Alshallaqi (2022) pointed out that thousands of graduates are produced each year in KSA, with limited labour market opportunities. Thus, the KSA labour market is unable to absorb these graduates upon completion of education. Bosma and Levie (2020) stated that GEM indicated that KSA experienced a low entrepreneurship intention among students. This has made graduates preferred seeking government jobs to establishing a business. It is due to this decline in an entrepreneurship attitude that KSA lagged behind major economies in the world. To deal with this problem, KSA also resorted to the inclusion of entrepreneurship in the curriculum within higher education institutions (Fridhi, 2020). The inclusion of entrepreneurship education was meant to change student attitudes towards entrepreneurship. Besides the transformation of the higher education curriculum, the KSA government provided support to self-employed students in the form of training and skills development (Abou-Moghli and Al-Abdallah, 2019). With this initiative, the KSA government recognised the significance of student self-employment in the development of the economy.

The United Arab Emirates (UAE) also realised the importance of entrepreneurship in economic development and student self-employment. Its commitment to entrepreneurship is signified by the level of investment in entrepreneurial programmes aimed at benefiting SMEs and self-employed students. Hamdan et al. (2019) highlighted that the UAE invested a greater portion of its proceeds

from oil trade to entrepreneurship development. The UAE government, therefore, resorted to the sponsorship of new businesses, including those owned by students. Thus, in a way, the UAE promoted student self-employment. The UAE also engaged in the nurturing of SMEs using different legislative measures (Tok, Koç and D'Alessandro, 2021). Part of the nurturing included the provision of financial and non-financial support to newly established businesses. Non-financial support included training and skills development to improve the competitiveness of the established businesses. It is out of this commitment that the UAE was ranked number one in terms of entrepreneurship in the Middle East and North Africa region. Also, the UAE was ranked number 19 in the world for its commitment towards entrepreneurship (Global Entrepreneurship and Development Institute Index, 2016).

2.5.5 Student self-employment support in South America

In South America, Brazil has shown its commitment to entrepreneurship and student self-employment through the involvement of various key stakeholders. Alves, Fischer, Schaeffer and Queiroz (2019) confirmed that Brazil involves its universities, industry and government to come up with solutions to improve the level of student self-employment in the country. As already highlighted in Chapter 1 and subsequent sections of this study, this system is known as the triple helix model. Brazil showed its commitment to the use of the triple helix model as a mechanism to promote student self-employment through its participation in the triple helix model events (Terra, Lehnemann, Resende, Almeida and Gouvea, 2023). Consequently, Brazil hosted one of the first triple helix model international conferences (De Mello, 2017). Brazil also has the highest delegation in the triple helix model international conferences. Apart from being one of the first hosts of the triple helix model international conferences, Brazil played a significant role in the development of the triple helix model Association (2017)

In line with the standards of the triple helix model, Brazil thrives on its entrepreneurship progress using universities, industry, and government (Ranga and Etzkowitz, 2015). Thus, universities in Brazil have included entrepreneurship in their curriculum to encourage the formation of businesses among their students. This action was taken to encourage entrepreneurship, including student self-employment. Apart from transforming the curriculum, universities invested effort in providing training, mentorship and coaching to self-employed students. The government in Brazil also became involved through the provision of financial and non-financial support to self-employed students. Dalmarco, Hulsink and Blois (2018) indicated that the industry provided support to students involved in entrepreneurship through internships and financial support.

2.5.6 Student self-employment support in Oceania

The Oceania region is also quite abreast with the concept of the triple helix model to encourage student self-employment. The Auckland region in New Zealand, for instance, has benefited from initiatives of universities, government, and community partners (Miranda, 2021). These initiatives were aimed at developing entrepreneurship and student self-employment in the region (Maritz, Nguyen and Ivanov, 2022). One of these initiatives concentrated on enhancing understanding of science, technology, engineering, and mathematics, which led to the development of innovative ideas required for further improving entrepreneurship and student self-employment within the region (Breznitz and Zhang, 2020). Consequently, these initiatives encouraged students to start thinking of becoming job creators rather than job seekers (Adeyemi, 2021).

The Hunter region in the State of New South Wales, Australia, has shown an understanding and importance of the triple helix model. Its understanding is signified by the coordination of the three broad institutional categories, which are universities, industry and government agencies (Howard, Williams and Agarwal, 2016). The role of industry and business is identified in terms of its commitment to providing self-employed students with market orientation assistance, which is important for them to be competitive (Adegbile, Sarpong and Cao, 2021). Several business groups and networking organisations in the Hunter region endeavoured to promote economic development and innovation through the provision of support to self-employed students (Australian Government, 2020). The Australian Industry Group, for example, hosts manufacturing clusters. These manufacturing clusters benefit students who have business ventures in manufacturing (Rainnie, 2021). The Hunter Business Chamber hosts a Founders Forum to assist newly established businesses, including those owned by students (Business NSW, 2023). The Hunter Business Center was established to assist SMEs (Howard, Williams and Agarwal, 2016).

The function of academic institutions in the Hunter area is defined by the extensive roles of the University of Newcastle and the Hunter Institute of Technical and Further Education (City of Newcastle, 2021). These two institutions have established a close relationship with the industry to ensure that their efforts to improve youth entrepreneurship are synchronised (Howard, Williams and Agarwal, 2016). Apart from this relationship, the government plays a significant role through its institutions, for example, the Departments of Industry, Agriculture, Planning, and Environment; and the eleven local government agencies (Van Luyn and Fuente, 2019; McIntyre, Balnaves, Kerrigan, King and Williams, 2019). The Hunter region, therefore, has an established triadic partnership that helps to develop student self-employment which is required in accomplishing innovation and regional economic development goals and outcomes.

2.5.7 Student self-employment support in Africa

Similar to other continents, Africa has attempted to make use of the triple helix model as a method to promote entrepreneurship and student self-employment. However, its use has not been fully embraced across different parts of the continent (African Academy of Science, 2019). The use of the triple helix model has faced challenges emanating from a lack of development of each of the tripartite stakeholders that should be involved (Okonofua, Odubanjo and Balogun, 2020). Thus, most universities, industries and governments in Africa have struggled to move out of their day-to-day routines to form an alliance with each other for the sake of promoting entrepreneurship and student self-employment (Yongabo and Göransson, 2022). The inability of these three players to unite and contribute substantially has been partly caused by numerous challenges facing the continent. Consequently, instead of focusing on entrepreneurship and student self-employment development, Africa finds itself in several challenges needing immediate attention. Balogun (2020) stressed that the challenges facing Africa include climate change, food insecurity, poverty, infectious disease, high child mortality rate, gender inequality and energy shortage. Because of these challenges, partners in the triple helix model find themselves without a sufficient budget to focus on the entrepreneurship and self-employment agenda (Hassan, 2020).

Universities should play a role in knowledge production, which is essential for discovering innovative ideas required for entrepreneurship and student self-employment. However, due to the limited budget facing most universities and research institutions in Africa, research efforts have remained marginalised (Ravi and Janodia, 2022). Often, little research that comes out from the continent is divorced from sustainable development goals. Balogun (2020) pointed out that most researchers in the African region have struggled to produce outputs of substance due to limited budgets. Apart from budget constraints, most researchers in the region are driven by earning tenure and promotion rather than the ultimate contribution of their research. Moving back to the budget constraint, one would realise that African countries do not invest substantially in research. Okonofua et al. (2020) pointed out that only 0.4 per cent of the gross domestic product was invested in research. This is quite dwarfed compared to the budget commitment to research in the rest of the world. Asia, Europe, and North America contributed 31 per cent, 27 per cent and 37 per cent of their gross domestic product towards research, respectively (Olufadewa, Adesina and Ayorinde, 2020). This scenario shows that the research budget in Africa is quite miniature. As already indicated, a limited budget discourages the development of innovative entrepreneurial ideas and student self-employment. Also, these budget constraints have created a lower supportive environment for entrepreneurship in Africa. As a result of a low supportive entrepreneurship environment, unemployment has also become a common problem facing the continent (Davey, Hannon and Penaluma, 2016, Amani, 2017; Hahn, Minola, Van Gils and Huybrechts,

2017). The African Center for Economic Transformation (2016), Katundu and Gabagambi (2016) and Nandonde and Malaki (2020) alluded that at least 10 million graduates are produced each year from African universities and only 50 per cent of these graduates can secure employment.

Despite the aforementioned challenges facing Africa, there are countries in the region that have continued to make substantial efforts to promote entrepreneurship and student self-employment. Nigeria is one of these countries that have shown commitment towards the development of student self-employment. According to Oluseye et al. (2017), the Nigerian government, through its Federal Ministry of Education, has made efforts to transform the higher education system to be entrepreneurial. Consequently, the Federal Ministry of Education in Nigeria introduced entrepreneurship education in the curriculum at institutions of higher learning, namely universities, polytechnics and colleges (Yahya, 2014). The transformation and introduction of entrepreneurship in the Nigerian higher education system were made smooth through regulatory agencies that include the National Universities Commission, the National Board for Technical Education and the National Commission for Colleges of Education (Oyefesobi, Adetunji and Ayedun, 2018). The Nigerian Federal Ministry of Education further provided a directive that entrepreneurship should be made a compulsory course for all students in higher education, irrespective of their discipline of specialisation (Yahya, 2014). This move was meant to develop entrepreneurship skills among higher education students across Nigeria. Apart from the introduction of entrepreneurship, Nigeria also established a centre for entrepreneurship development with the purpose to advance entrepreneurship skills, for example, proactiveness, flexibility and communication, among Nigerian higher education students (Osakede, Lawanson and Sobowale, 2017). However, the contribution of the private sector towards student self-employment in Nigeria remains unclear. Obtaining successful student self-employment requires the commitment of universities, industry and government. These institutions need to work together with a common purpose to attain entrepreneurship progress among higher education students.

In Ghana, economic development is driven by SMEs. Thus, SMEs occupy 90 per cent of the economy while they have an 85 per cent stake in manufacturing (Ntiamoah, Li and Kwamega, 2016). SMEs in Ghana focus on agroprocessing, baking, blacksmithing, brickmaking, brewery, detergent making, electronic assembling, leather making and tree felling (KesseYkwaku, 2014). These areas of trade can be an opportunity for self-employed students. Also, self-employed students could benefit from a rich source of natural resources in the country, for example, timber, bauxite, gold and diamonds. However, the potential of self-employed students is bound to be limited due to limited funds, shortage of machinery and unavailability of technical know-how (Kipnis, 2013; International Finance Corporation, 2014; Ntiamoah et al., 2016). The Ghanaian government have made efforts to counteract these challenges by establishing the Ghana Enterprise Development Commission, officially known as the

Office of Business Promotion (Ayandibu, Kaseeram and Ayandibu, 2021). This establishment was focused on providing financial and non-financial support to SMEs until the late 1970s (Ntiamoah et al., 2016). Despite the existence of the Ghana Enterprise Development Commission, SMEs in Ghana continued to face problems. This led to the development of the National Board for Small-Scale Industries (NBSSI), which is an entity established within the Ministry of Industries, Science and Technology (Owusu, 2019). The NBSSI was established under Parliament Act 434 in 1981 to handle the concerns of SMEs. Through the NBSSI, SMEs, including self-employed students, are expected to receive financial and non-financial assistance. Despite the efforts made by the government to improve the operations of SMEs, there is no evidence of coordination between universities and the industry. Ghana still needs to combine coordinated efforts from universities, industry and government to substantially influence student self-employment.

2.6 Student self-employment support in South Africa

Significant effort has been put in South Africa to support student self-employment. This is evidenced by the number of acts of parliament, institutions and programmes that have seen the light of day to date (Chinomona, Popoola and Popoola, 2020). These initiatives show the commitment of South Africa to support student self-employment. The acts of parliament developed in South Africa to support student self-employment are discussed in the next subsection.

2.6.1 Acts of parliament in South Africa and their effect on student self-employment

The acts of parliament supporting student self-employment emanates from the Constitution of the Republic of South Africa, 1996. Since 1996, the Parliament of South Africa developed several acts to support entrepreneurship, including student self-employment as shown in Table 2.2. These acts include the Business Act of 1991, the National Youth Commission Act 19 of 1996, the National Small Business Act 71 of 1996, the Skills Development Act 97 of 1998, and the National Youth Development Agency Act of 2008 (Haasje, 2006; Chiloane and Mayhew, 2010; Skinner, 2018; Laubster, 2018).

Table 2.2 Acts of parliament in support of student self-employment in South Africa

Acts of Parliament in Support of student self-employment in South Africa
Business Act 1991
National Youth Commission Act 19 of 1996
National Small Business Act 102 of 1996
Skills Development Act 97 of 1998
National Youth Development Agency Act 54 of 2008

Source: Government Gazette of the Republic of South Africa (1991)

2.6.1.1 Business Act 71 of 1991 and its effect on student self-employment

The Business Act 71 of 1991 was assented to on 15 May 1991 through the State President of the Republic of South Africa (Government Gazette, 1991). This Act was formulated to regulate the registration of businesses in South Africa. Also, the Act was meant to provide control of the operating hours of registered businesses (Michie and Padayachee, 2021). This Business Act provided support to student self-employment in the sense that it provides a provision to allow students to register their business ventures in the companies registry. This Act, therefore, helped to provide recognition of businesses of self-employed students (Bansi and Reddy, 2015). However, it should be realised that having an Act in place is one thing but having it implemented most effectively is another. The implementation of this Act needs to involve key stakeholders of the society. These key stakeholders are spelt out in the triple helix model as universities, industry and the government. It seems the Business Act of 1991 only involves the government as the role player in the facilitation of business registration and regulation of business operating hours. The Act could give universities and the industry a mandate to educate self-employed students on the importance of having their business ventures registered. Apart from providing such business registration education, these role players can be hands-on in assisting students in the actual registration of the businesses.

2.6.1.2 National Youth Commission Act 19 of 1996 and its effect on student self-employment

The National Youth Commission Act 19 of 1996 is also another fundamental Act of Parliament that provides support to the operations of self-employed students (South African Government, 2023). This Act commenced on 19 June 1996. The objective of the Act was to provide socio-economic empowerment to the youth (Aharonovich, 2019). The Act also stipulated that youth should be given the mandate to play a significant role in the society based on the argument that they are energetic, creative and constitute the largest portion of the population (Lambrechts, Sinha and Marwala, 2020). The National Youth Commission Act 19 of 1996, therefore, empowered youth to get access to existing

opportunities (Laubscher, 2018; South African Government, 2023). However, it should be noted that this Act was repealed by the National Youth Development Agency Act 54 of 2008.

2.6.1.3 National Youth Development Agency Act 54 of 2008 and its effect on student self-employment

The National Youth Development Agency Act 54 of 2008 repealed the National Youth Commission Act 19 of 1996 to provide more advanced measures for economic development of the youth (South African Government, 2023). Thus, this Act aimed at providing youth with access to the economy (Dube, 2020). In the context of this study, access to the economy is facilitated by student self-employment. As already indicated in different sections of this study (see section 2.2), student self-employment is synonymous with entrepreneurship. Consequently, this Act is relevant in the promotion of student self-employment (Leshilo and Lethoko, 2017). Also, indicated in the Act is the provision of education and skills development afforded to the youth who are also referred to as students in this study (South African Government, 2023). The provision of education and skills development is critical in improving the entrepreneurial competence of self-employed students. It is also the objective of the Act to ensure that organs of the state, the private sector and non-governmental organisations interested in adding to the economic empowerment of youth are unified in approach (Motha and Nenzhelele, 2018). The fundamental principles of the Act require key stakeholders to work together to empower the youth (Odongo and Kyei, 2018). This approach emulates the triple helix model. However, the Act is silent on the participation of universities. A balanced system needs to include the government, industry and universities. Probably the initiative on education and skills development could be mandated to universities so that specialised entrepreneurial skills are transferred to self-employed students who are affected by the aforementioned Act.

2.6.1.4 National Small Business Act 102 of 1996 and its effect on student self-employment

The National Small Business Act 102 of 1996 is also another important instrument meant to promote student self-employment (South African Government, 2023). This Act was assented to on 12 November 1996 to contribute to providing economic empowerment of small businesses in South Africa. The National Small Business Act 102 of 1996 is relevant to self-employed students since they occupy the category of small businesses. As its objective, this Act aims at promoting small businesses in South Africa (Nieuwenhuizen, 2019). As part of promoting small businesses, the Act mandates the Ntsika Enterprise Promotion Agency to carry out various functions aimed at promoting small businesses (Parliamentary Monitoring Board, 2014). Consequently, Ntsika Enterprises Promotion Agency has the responsibility to provide financial and non-financial services to small businesses (Mago and Toro, 2013). Since self-employed students are part of small businesses, they should be covered in

the services offered by Ntsika Enterprises Promotion Agency. Part of the non-financial services offered by the agency is business advice and counselling services to small businesses (South Africa, Government Gazette, 1996). Other non-financial services provided to small businesses include the facilitation of access to raw materials and national/international markets. The National Small Business Act is founded with the fundamental objective to promote small businesses (The Banking Association South Africa, 2023). However, its implementation needs to be scrutinised. It seems the Act only relies on Ntsika Enterprise Promotion Agency in its implementation of the mandate to provide financial and non-financial services to small businesses (i.e., self-employed students). Relying on a single agency might be detrimental to the success of the Act. It is for this reason that a triple helix model approach needs to be considered where universities, industry and government work together to ensure that the mandate gets effectively delivered.

2.6.1.5 Skills Development Act 97 of 1998 and its effect on student self-employment

The Skills Development Act 97 of 1998 was assented to by the President of South Africa on 20 October 1998 (Government Gazette, 1998). This Act was enacted to develop and improve the skills of the workforce in South Africa (Bag, Pretorius, Gupta and Dwivedi, 2021). The workforce in South Africa also includes self-employed students since they directly provide service in their business ventures. The purpose of the Act also clarifies that it also aims to promote self-employment (South African Government, 2023). Therefore, the Skills Development is relevant to this study. This Act aims at improving the productivity and competitiveness of employers, for example, self-employed students in South Africa (Moganedi and Sithole, 2020). Productivity and competitiveness occur as a result of entrepreneurial competence that is naturally gained from skills development (Smirnov, Dmitrichenkova, Dolzhich and Murzagalina, 2023). The entrepreneurial competence of self-employed students is driven by the possession of entrepreneurial skills such as innovativeness, creativity, risk-taking, oral communication, and assertiveness (Bird, 2019). The Skills Development does not only encourage the development and improvement of skills of self-employed students but also finances the process of acquiring the skills (Mathekga, Mahlaela and Maciko, 2022) Hence, the Act finances skills development through the levy-grant scheme and the National Skills Fund. The Act also encourages partnerships between the government and private sector to ensure that there is effective and efficient skills development. Although the Act encourages the cooperation of government and the industry, it is not explicit about the involvement of universities in the development and improvement of skills in South Africa. This needs to be addressed considering the critical role played by universities in knowledge development across the world.

2.6.2 Institutions in support of student self-employment in South Africa

Several institutions in South Africa contribute towards student self-employment in South Africa. These institutions cut across different sectors to include universities, industry and the government as shown in Table 2.3. Among the 26 universities, the University of the Free State, University of the Western Cape, University of Cape Town, University of Limpopo, University of Mpumalanga, Durban University of Technology, are participating in the encouragement of student self-employment through the EDHE programme (Universities South Africa, 2020; Price and Ronnie, 2021). Public universities in South Africa are involved in entrepreneurship and student self-employment development through various campus entrepreneurship programmes (Dzomonda and Fatoki, 2019). These programmes taking place on campus include student mentorship, coaching and entrepreneurship training. It is for this reason that the current study sought to investigate the effectiveness of these programmes in determining successful student self-employment (Olivier and Burton, 2020).

Apart from the 26 public universities, support towards student self-employment emanates from government institutions in South Africa (Larbi and Gyedu, 2021). These government institutions include the Department of Small Business Development, Small Enterprise Development Agency, Small Enterprise Finance Agency, National Empowerment Fund and Industrial Development Cooperation of South Africa (Hewitt and Rensburg, 2020). Other government agencies who are supporting student self-employment include the National Youth Development Agency, Micro Agricultural Financial Institutions of South Africa, Ecosystems Development for Small Enterprises Programme and Ntsika Enterprise Promotion Agency (South Africa, Department of Agriculture, Forestry and Fisheries, 2018; Dalibozhko and Krakovetskaya, 2018; Meyburgh, 2022). Table 2.3 shows the various government institutions that support student self-employment. These government agencies provide financial and non-financial support to small businesses, including self-employed students (Odeku and Rudolf, 2019). Non-financial support includes mentorship, coaching and training on entrepreneurship (Malebana, 2017).

Table 2.3 Institutions in support of student self-employment in South Africa

Institutions in Support of student self-employment in South Africa
Department of Small Business Development (DSBD)
Small Enterprise Development Agency (SEDA)
Small Enterprise Finance Agency (SEFA)
National Empowerment Fund (NEF)
Industrial Development Cooperation of South Africa (IDC)
National Youth Development Agency (NYDA)
Micro Agricultural Financial Institutions of South Africa (MAFISA)
Ecosystems Development for Small Enterprises Programme (EDSE)
Ntsika Enterprise Promotion Agency
Khula Enterprise Finance
Landbank
South African Institute for Entrepreneurship
National Coordinating Office for Manufacturing Advisory Centres (NAMAC)
Junior Achievement South Africa Enterprise Development Programme
Enactus
Women's Enterprise Development Initiative (WEDI)
Department of Trade and Industry (DTI)
Universities South Africa
Public universities

Source: Allan Gray (2023); Aspen (2023); First National Bank, (2023)

The industry has also shown considerable interest in supporting student self-employment. Consequently, Aspen, Barloworld, South African Breweries, Allan Gray, Standard Bank, ABSA and Nedbank are some of the private organisations that support student entrepreneurship projects (Allan Gray, 2023; Aspen, 2023; First National Bank, 2023). These private organisations are running entrepreneurship programmes that are beneficial to self-employed students in South Africa. A list of these programmes is provided in Table 2.4. Just to mention a few, these programmes include the Aspen Network of Development Entrepreneurs, the Allan Gray Orbis Foundation, First National Bank's Vumela Enterprise Development Fund and Standard Bank Enterprise Development Programme. These programmes also provide financial and non-financial support to self-employed students so that they can succeed in their business ventures.

Table 2.4 Programmes in support of student self-employment in South Africa

Programmes in Support of student self-employment in South Africa
Tourism Enterprise Programme (TEP)
Tholoana Enterprise Programme (South African Breweries)
Siyakhula Enterprise Development Programme (Barloworld)
Aspen Network of Development Entrepreneurs (ANDE) (Aspen)
The Allan Gray Orbis Foundation
Standard Bank Enterprise Development Programme
First National Bank's Vumela Enterprise Development Fund (First National Bank)
Nedbank Enterprise Development Programme (Nedbank)
ABSA's Enterprise Development Fund (ABSA)
The Integrated Strategy on the Promotion of Entrepreneurship and Small Enterprise 2005
The Integration Strategy on the Development and Promotion of Cooperatives 2012
The National Informal Business Upliftment Strategy (NIBUS) and Implementation Framework (2014 and 2015)
Entrepreneurship Development in Higher Education

Source: Allan Gray (2023); Aspen (2023); First National Bank, (2023)

However, despite the existence of acts of parliament, institutions and programmes to support student self-employment in South Africa, there are still existing challenges. These challenges are affecting the operations of self-employed students in South Africa. The existence of these problems makes one question the effectiveness of the effort invested in promoting student self-employment in South Africa.

2.6.3 Challenges facing student self-employment in South Africa

Even though several benefits can be traced to student self-employment, there are multitudes of challenges that are also associated with the operations. There is a general agreement in the literature that challenges encountered in student self-employment include difficulty in accessing finance, unavailability of control systems, lack of collateral, unfavourable market conditions, lack of institutional support, lack of resources, and lack of skills (Anwar, Khan and Khan, 2018; Bertoni, Marti and Reverte, 2018; Park, Lee and Kim, 2020). Limited attention has been given to challenges affecting student self-employment. It is for this reason that the current section should stimulate debate aimed at understanding the challenges facing self-employed students.

2.6.3.1 Unavailability of control systems

The unavailability of control systems is a common problem among SMEs. Most student business establishments fall within the ambit of SMEs. Berton et al. (2018) alluded to the point that small businesses, for example self-employed students, do not have sufficient internal control systems. The lack of internal control systems deprives self-employed students of complete control of their business operations. Coad and Rao (2008) and Mina, Lahr and Hughes (2013) argued that the inability to control the operations of the business leads to uncertainty. Consequently, self-employed students find themselves in a situation where by they are not in touch with their day-to-day business reality. This situation stiffens the ability of self-employed students to grow their business ventures.

2.6.3.2 Lack of physical resources

Physical resources include business assets such as machinery, vehicles, printers, computers and many other tangible material valuable to the organisation. Acs, Åstebro, Audretsch, and Robinson (2016) explained that self-employed students do not have sufficient physical resources to sustain their business operations. This lack of physical resources makes it difficult for self-employed students to capitalise on market opportunities (Al-Suraihi, Ab Wahab and Al-Suraihi, 2020). Anwar et al. (2018) also pointed out that small businesses are unable to compete effectively due to a lack of resources. With a resource limitation, student self-employment is hindered from growth. Resources play a significant role in ensuring the effectiveness and efficiency of business operations.

2.6.3.3 Lack of collateral

Collateral is referred to as a form of security that a business presents to a supplier of finance in case a default of repayment occurs. Most small businesses, including self-employed students, are usually found without collateral (Autio and Fu, 2015). The lack of collateral naturally corresponds with the lack of physical resources (Bertoni et al., 2018). Thus, when self-employed students lack physical resources, they find themselves without the required collateral to present to financial institutions. The lack of collateral continues to be a problem for self-employed students since their operations are relatively small (Schneider and Veugelers, 2010). Smaller operations translate to fewer physical resources.

2.6.3.4 Lack of institutional support

Institutional support should come from various organisations, which include universities, industry and government. These organisations are expected to offer support in the form of finance, skills training and resources. Anwar et al. (2018) found that self-employed students suffer from a lack of institutional support. The aforementioned institutions do not do enough to support self-employed students. Consequently, self-employed students find themselves without sufficient resources to sustain their

operations. Park et al. (2020) pointed out that universities are not providing sufficient entrepreneurial skills to students. Lack of entrepreneurial skills has made it difficult for self-employed students to achieve competitive advantage. The government and private sector are also not assisting students with the needed resources to prosper in their business ventures (Acs et al., 2016).

2.6.3.5 Lack of skills

Self-employed students find themselves without sufficient skills to deal with the day-to-day challenges of their business operations. Ntiamoah, Li and Kwamega (2016) elucidated that most self-employed students lack entrepreneurial skills such as innovativeness, creativity, risk-taking and financial literacy. The lack of entrepreneurial skills prohibits self-employed students from achieving a competitive advantage. Park et al. (2020) also argued that self-employed students require entrepreneurial skills to handle business operations. As alluded to in the previous subsection, institutions need to assist self-employed students to build the skills needed for successful entrepreneurship.

2.6.3.6 Unfavourable market conditions

Market conditions include factors emanating from suppliers, customers, competitors, government, society and many other relevant stakeholders. Anwar et al. (2018) argued that most small businesses, for example those run by self-employed students, struggle due to unfavourable market conditions. Self-employed students find themselves facing a shortage of supplies and customers. The shortage of supplies makes it difficult for the business operations of self-employed students to thrive. Also, the difficulty in getting customers is another challenge that can make it difficult for self-employed students to remain competitive (Nguyen, Van, Bartolacci, and Tran, 2018).

2.6.3.7 Difficulty in accessing finance

It is common knowledge that SMEs struggle with access to finance (Schneider and Veugelers, 2010; Hutton and Lee, 2012; Mina et al., 2013). Self-employed students also find it difficult to access finance due to the nature of their operations. In most cases, self-employed students operate without collateral. The lack of collateral corresponds to the lack of physical resources as indicated in section 2.13.2. It is common knowledge that businesses struggle to obtain financial resources when there are no physical resources to prove collateral (Nguyen et al., 2018). Thus, it is upon this background that the current study is essential to assess the role played by different stakeholders in ensuring that self-employed students find accessible sources of finance. The existence of numerous challenges warrants the need to investigate the contribution of key stakeholders in the development of successful student self-employment.

2.7 Chapter summary

This chapter has presented the context of the current study. The context has been presented in line with entrepreneurship and student self-employment across the world. Thus, a critical analysis of student self-employment has been provided to cover regions that include Europe, North America, Asia, South America, Oceania, the Arab States and Africa. This chapter also zoomed in to provide a further detailed analysis of the state of support provided to student self-employment in South Africa, which is the context of the current study. In this analysis, five acts of parliament have been analysed to understand their effect on student self-employment in South Africa. These acts include the Business Act of 1991, the National Youth Commission Act 19 of 1996, the National Small Business Act 102 of 1996, the Skills Development Act 97 of 1998, and the National Youth Development Agency Act of 2008. One of the biggest weaknesses of these acts is the failure to include universities within the mandate to contribute to entrepreneurship development. Apart from the acts of parliament, this chapter also highlighted different government and private organisations that are contributing to student self-employment. Also, the programmes carried out by these organisations are indicated in Table 2.4. While there is evidence of support from different acts of parliament, organisations and various programmes, there are numerous challenges that threaten the success of student self-employment. Some of these challenges include a lack of physical resources, difficulty in accessing finance, lack of skills and unavailability of institutional support. The existence of these challenges makes it important to investigate the effect of university initiatives, industry support and government support towards student self-employment in South Africa. It is upon this background that the next chapter presents a literature review in line with the theoretical and conceptual framework within the lanes of the triple helix model, student self-employment, entrepreneurial competence and social support.

Chapter 3

LITERATURE REVIEW: THEORETICAL FRAMEWORK AND CONCEPTUAL FRAMEWORK DEVELOPMENT

3.1 Chapter overview

The preceding chapter presented a literature review based on the context of the current study. This chapter focuses on the development of a theoretical and conceptual framework. The discussion of the chapter will, therefore, be based on the theoretical framework to include the triple helix model, the entrepreneurial action theory, the human capital theory, and the social capital theory. Also, included in the discussion are the key constructs of the study, which include university initiatives, student self-employment, industry support, government support, entrepreneurial competence, and social support. The chapter also provides previous empirical studies on the aforementioned constructs.

3.2 Introduction

The previous chapter highlighted numerous challenges that are encountered by self-employed students in South Africa. Some of the challenges indicated include the unavailability of control systems, lack of physical resources, inadequate institutional support, lack of skills, unfavourable market conditions and difficulty in accessing financial resources (Anwar et al., 2018; Bertoni et al., 2018; Park et al., 2020). These challenges threaten the success of student self-employment in South Africa. Also, the existence of these challenges makes one question the effectiveness of the various stakeholders whose mandate is to provide support towards student self-employment. Responsible stakeholders in this case are universities, industry and government (Feola et al., 2019; Gachie, 2020). The previous chapter also provided evidence of the effort that has been invested by these three stakeholders as far as the success of student self-employment is concerned. However, despite such efforts challenges still surface as highlighted in section 2.13. This situation made it important to carry out an investigation aimed at understanding the effect of university initiatives, industry support, government support, entrepreneurial competence and social support on student self-employment. This investigation is a direct response to a growing concern that a comprehensive student self-employment ecosystem that functions on the complete contribution of universities, industry, government, entrepreneurial competence and social support is non-existent. This study sought to address this gap through the development of a student self-employment multi-level model that functions based on individual (entrepreneurial competence), institutional (university initiatives, industry support and government

support) and societal (social support) factors. In line with the aforementioned argument, this study sought to stimulate debate focused on university initiatives, industry support, government support, entrepreneurial competence and social support. To allow a compendious understanding of these constructs, this study will emanate the discussion from the theoretical framework in which it is grounded. Consequently, four theories, which include the triple helix model, the human capital theory, the entrepreneurial action theory and the social capital theory, will be analysed (Oluseye et al., 2017; Champenois and Etzkowitz, 2018; Alonso, Kok, O'Brien and Geneste, 2020; Rajchamaha and Papojanasomboon, 2021). The next section introduces the theoretical framework of this study.

3.3 Theoretical framework

As already indicated in Chapter 1 and sections 3.1 and 3.2, this study is grounded on four theories. These theories include the triple helix model, the human capital theory, the entrepreneurial action theory and the social capital theory. The triple helix theory grounds university initiatives, industry support and government support (Leydesdorff and Porto-Gomez, 2019). The human capital theory provides the theoretical grounding for entrepreneurial competence (Raphael, 2020). The entrepreneurial action theory grounds student self-employment (Hunt, Lerner, Johnson, Badal and Freeman, 2022) while the social capital theory provides grounding to social support (Davey et al., 2016). The triple helix model is presented next.

3.3.1 Triple helix model

The triple helix model explains the intertwined relationship that exists between universities, industry and government (Gachie, 2020; Fidanoski, 2022). The association among these three stakeholders explains why the model is termed *triple*. This, therefore, set universities, industry and government as equal contributing partners within the model. As already indicated in Chapter 1, this model was theorised by Henry Etzkowitz and Loet Leydesdorff in the 1990s (Etzkowitz, 1993). Etzkowitz and Dzisah (2013) and Champenois and Etzkowitz (2018) argued that the triple helix model was first introduced by Leydesdorff and Etzkowitz at an academic conference in 1996. The triple helix model was introduced as resembling the double helix shape of the DNA that winds around each other as a twisted ladder in a helix shape. This provides a deeper meaning of the extent to which the three stakeholders involved in the triple helix model should rely on each other. Fidanoski et al. (2022) referred to the triple helix model as a model for innovation. Brem and Radziwon (2017), Dziallas and Blind (2019) and Gachie (2020) also referred to the triple helix model as a policy tool aimed at promoting innovation. This explains the expectations that are laid on the formation of the triple helix model. Advocates for the triple helix model expect solutions to be developed out of the association between universities, industry and government (Gachie, 2020; Fidanoski, 2022). In the case of the current study, the triple

helix model is expected to bring solutions that drive successful student self-employment. Thus, each of the stakeholders defined in the triple helix model has a role to play towards successful student self-employment.

It should also be realised that the triple helix model can be identified in three forms. According to Etzkowitz and Leydesdorff (2000), the three forms of the triple helix model include the static model, the laissez-faire model and the balanced model. This distinction in terms of the different forms of the triple helix model was also highlighted in Chapter 1. However, it was not discussed at great length. This section aims at providing an understanding of these three types of the triple helix model. The static model explains a scenario where the government has power over universities and industry. In this case, government plays a leadership role where it drives the programme of action (Etzkowitz, Dzisah, and Zhou, 2007; Cai and Etzkowitz, 2020). This programme of action details what each stakeholder should contribute towards the association. However, placing the government in a superior position within the triple helix model has its weaknesses. This has the potential to take away the independence of the other important stakeholders in the helix. The approach, therefore, gives absolute power to the government to direct what other stakeholders should do and what they should not do.

Laissez-faire emerged as a result of the weakness of the static triple helix model. The Laissez-faire triple helix model gives freedom to all the stakeholders in the helix while allowing communication to take place across strong boundaries (Etzkowitz and Zhou, 2006). The provision of independence to all the stakeholders in the helix leads to independent thinking. Such independent thinking is required for creativity and innovativeness among the stakeholders. However, the extrication of the stakeholders in the helix can come at a disadvantage. In times when the triple helix model stakeholders are not pulling their weight, accountability can be difficult to enforce. Loss of accountability among stakeholders would also mean a decline in the contribution of the triple helix model. While independence is granted to the stakeholders of the triple helix model, it should not be given in such a way that they are too extricated to lose accountability (Bergmann, Hundt and Sternberg, 2016). The need for stakeholders in the triple helix model to be answerable cannot be over-emphasised. The contribution of each of the stakeholders needs to be consistently examined (Soares and Podcameni, 2014). Consequently, this will lead to the development of a balanced triple helix model. The balanced triple helix model eliminates the weaknesses of the static and laissez-faire models.

The balanced triple helix model is based on the principle of balanced contribution among universities, industry and government (Etzkowitz, and Leydesdorff, 1995; Ranabahu, Almeida and Kyriazis, 2020). Adopting the balanced triple helix model entails that the three stakeholders are expected to contribute

equally, however, by their expertise. Consequently, the contribution of universities should be in line with their skills and abilities, for example, knowledge production and delivery. In the context of this study, it will be the duty of universities to carry out research which provides an understanding of the conditions necessary for successful student self-employment (Zhang, Zhou, Porter, Gomila and Yan, 2013). Also, universities should rise to their formidable role of entrepreneurship knowledge delivery. In terms of industry, its expertise stems from trade and understanding market forces. The industry should, therefore, share this expertise with self-employed students so that they become competitive in their entrepreneurial operations. Another aspect to consider is the contribution of the government to the balanced triple helix model (Ghio, Guerini and Rossi-Lamastra, 2016; Meoli and Vismara, 2016). Its contribution should be that of providing a conducive environment in which student self-employment thrives. As indicated in Chapter 2, a conducive environment is created through the establishment of supportive acts of parliament. In the South African context, several acts of parliament were put in place to create a supportive environment for student self-employment. These acts of parliament include the Business Act 71 of 1991, the National Youth Commission Act 19 of 1996, the National Small Business Act 102 of 1996, the Skills Development Act 97 of 1998, and the National Youth Development Agency Act of 2008. Apart from the establishment of these acts, the government also set up institutions and programmes to support student self-employment. This study sought a balanced contribution of the triple helix model stakeholders. Consequently, the balanced triple helix model was adopted in this study to ground university initiatives, industry support and government support. As a mechanism to further understand the triple helix model, its evolution shall be analysed in the next subsection.

3.3.1.1 Evolution of the triple helix model

The triple helix model goes through a period of evolution. Within this evolution, four distinct stages can be identified. The evolution stages through which the triple helix model goes through include the realisation of the needs, intra-organisational transformation, interactions between organisations in the three sectors and institutionalisation of the triple helix model (Rajchamaha and Papojanasomboon, 2021). This evolution describes the process through which an effective and efficient triple helix model is attained. It should also be noted that this triple helix model will be described in the context of student self-employment in South Africa. The first stage in the evolution is explained next.

3.3.1.1.1 Stage 1: Realisation of the needs

The realisation of the needs is regarded as the first stage in the evolution of the triple helix model. Within this stage, stakeholders of the triple helix model should realise the need to enter into the

association (Zhang, 2011). In the context of this study, the need to be realised would be the need for student self-employment. Universities, industry and government need to have a balanced view in realising this need (Zawislak and Dalmarco, 2011). Thus, common understanding should also be driven by the importance of the need for student self-employment. Understanding the importance of self-employment helps to develop commitment among the three stakeholders (Xu and Zhou, 2011). It is this common understanding that should bring these stakeholders together for a reciprocal relationship. Through the balanced triple helix model, the stakeholders work together in contributing their unique expertise to the association. This should also be realised within the first stage of the evolution to allow collaboration among universities, industry and government (Etzkowitz, 2008; Wu and Gong, 2012; Bhutto and Lohana, 2018). This is in direct response to the concern that a single organisation can no longer respond to the challenges and uncertainties unless they collaborate with other sectors. Consequently, universities, industry and government are expected to come together at this stage to contribute their expertise towards programmes that leads to successful student self-employment. It is at this stage that the contribution of each stakeholder should be clarified. For instance, university initiatives need to be made clear to include their role in mentoring, coaching and training of students on entrepreneurial competencies (Rajchamaha and Papojanasomboon, 2021). Since it is known that university initiatives are usually theoretical, industry support should also come into play to share practical experiences on how to deal with operations, for example, marketing, finance and human resources (Zhang et al., 2013). At the same time, the role to be played by the government to support student self-employment should also be made clear.

3.3.1.1.2 Stage 2: Intra-organisational transformation

After the primary roles of each stakeholder have been established, it is important to evolve into intra-organisational transformation. Intra-organisational transformation entails understanding the roles of each other and to some degree being in a position to perform such roles (Williams and Woodson, 2012). This approach is required to create agility among the three stakeholders in the triple helix model. Thus, such agility enables all three stakeholders to be in a position to provide balanced initiatives and support towards student self-employment programmes. Thus, while these stakeholders maintain their primary mandates, they should also be able to understand the roles played by others in the association. Whetten (2009) argued that understanding each other's role is important for increasing effectiveness and efficiency in the programme. As a result of this approach, stakeholders can complement one another. The intra-organisational transformation allows universities to also step into roles that are predominantly meant for the industry (Wang and Zhou, 2008). However, universities should always keep in mind that their performance of such roles is only carried out at the secondary level. Consequently, universities should be in a position to engage business-related

initiatives, for example, providing a market for self-employed students. This can be carried out by allowing self-employed students to trade their products or services on campus following a particular developed protocol.

Another role that can be played by universities towards self-employed students will be the development of a business plan. In the case of the industry, intra-organisational transformation would mean taking roles that are primarily played by universities. The industry takes such roles at a secondary level. Examples of such roles would be the provision of learning and training on entrepreneurship. In the South African context, organisations such as Investec, Aspen, First National Bank, ABSA and Allan Gray provide entrepreneurship training programmes (Allan Gray, 2023; Aspen, 2023; First National Bank, 2023). As a secondary role, the industry is also permitted to engage in research to understand the phenomenon affecting the success of student self-employment. Government should also be in a position to assume some roles played by both universities and industry, for example, entrepreneurship training and funding of self-employed students. USAf, through the EDHE, is an example of a South African government agent that is hugely involved in promoting student self-employment while playing intra-organisational transformation roles (James, 2021; EDHE, 2023). However, there are certain primary means for government that cannot be performed by universities and industry. Such roles include the enactment of acts of parliament in support of student self-employment. Consequently, such roles should be left to be performed by the government.

While universities, industry and government engage in intra-organisation transformation, they must have an understanding of favourable institutional logic (Rajchamaha and Papojanasomboon, 2021). Thus, all three stakeholders should abide by the culture of market orientation and process management. In terms of market orientation, the triple helix model stakeholders should perform activities in a manner that assists self-employed students to create and maintain value for customers (Lackéus, 2015). The institutional logic of marketing orientation should be at the centre of activities carried out by universities, industry and government when supporting student self-employment. Viale and Pozzali (2010) and Liao, Chang, Wu and Katrichis (2011) discerned that market orientation leads to the competitiveness of self-employed students due to the development of customer-centric abilities. Process management is also another fundamental institutional logic that needs to be embedded in self-employed students by the triple helix model stakeholders. Intra-organisational transformational activities of the triple helix model stakeholders need to ensure that they promote process management through the establishment of innovative processes (Williams and Woodson, 2012). The encouragement of continuous learning is one way in which innovative processes can be achieved within self-employed student operations. It is for this reason that all the stakeholders need

to include entrepreneurship training as one of the support mechanisms to improve the effectiveness and efficiency of self-employed students.

3.3.1.1.3 Stage 3: Interactions between organisations in the three sectors

Understanding what each stakeholder in the triple helix model should do is not considered enough. Thornton, Ocasio and Lounsbury (2012) argued that universities, industry and government should interact with each other even after their roles have been established. Continuous interaction is encouraged to allow cooperation among the stakeholders. Someren and Someren-Wang (2013) emphasised that the intra-organisational transformation can lead to a set of challenges within the cooperation of the triple helix model stakeholders. To deal with such challenges and demands that arise during the intra-organisational transformation, universities, industry and government need to continue interacting. The third stage should, therefore, encourage interdependence between the triple helix model stakeholders. Such interactions and interdependency help to solve problems that may arise in the cooperation. Saad and Zawdie (2008) posited that universities, industry and government should make use of their cooperation to benefit from each other. For example, universities can make use of the industry as an environment to carry out research which is beneficial towards enriching student self-employment. Consequently, universities and the industry become strong partners in knowledge production. Also, universities and the industry require government to establish a conducive environment through which their programmes can be successful (Rao, 2013; Cai and Liu, 2014). The cooperation between universities, industry and government is desirable to allow each of the players to benefit from each other. It should also be noted that it is such cooperation that leads to the creation of hybrid organisations such as incubators, joint research centres and science parks. Of course, the formation of these hybrid organisations is beneficial towards the success of student self-employment.

3.3.1.1.4 Stage 4: Institutionalisation of the triple helix model

The institutionalisation of the triple helix model is the last stage in the evolution (Rajchamaha and Papojanasomboon, 2021). It is at this stage that the primary and secondary roles of the stakeholders have been established. Once stakeholder roles have been established, they need to be made part of the system and processes of the association. Rao (2013) indicated that the roles of the triple helix model stakeholders should be routinised such that those at the operational level know how to carry out their responsibilities. This goal can be achieved by developing policies and procedures through which work should be carried out. These policies and procedures need to outline what is expected from the different triple helix model stakeholders. However, room should be left to allow adjustment in these policies and procedures. This is important for continuous improvement over time. This

improvement ensures that the triple helix model stakeholders continue to deliver at their ultimate best (Etzkowitz, 2008). Setting a standard practice on how universities, industry and government should contribute, is beneficial to the success of student self-employment. Once a routine and standard have been set, these stakeholders understand what is expected from them. However, one should realise that the finalisation of the roles of the triple helix model stakeholders is preceded by several rounds of feedback and revisions. This is a necessary activity to allow the development of an effective and efficient triple helix model system in place. Feedback also helps to point out areas of weaknesses before the system is put to use. The cooperation of all the stakeholders is required for this process to be a success (Viale and Pozzali, 2010). The government can contribute to the success of the cooperation by providing financial incentives which promote cooperation between universities and the industry. With such cooperation, student self-employment should become a success. It should also be noted that the principles of the triple helix model made it the most appropriate theory to apply in this study. However, the triple helix model has been found wanting by some authors (Carayannis, Barth, and Campbell, 2012; Cai, 2014; Galvao et al., 2019). The next section presents the criticism of the triple helix model.

3.3.1.2 Criticism of the triple helix model

One of the criticisms placed on the triple helix model is that it was developed based on the experiences of developed countries in the West. Cai (2014) argued that even though the triple helix model is hailed for its ability to influence innovation, its principles are rooted in the experiences of the Western world. It is further argued that there is no vivid theoretical evidence to indicate that the triple helix model applies to the non-Western context (Carayannis et al., 2012). Based on this reasoning, one needs to apply the triple helix model with caution. Balzat and Hanusch (2004) also reiterated that the triple helix model pays no consideration to the national context. Thus, there is no attempt by the triple helix model to accommodate the conditions of the country in which it is implemented. It should be noted that conditions differ from one country to another. Hence, the applicability of the triple helix model needs to consider the conditions of each country applied. Etzkowitz and Leydesdorff (2000) also acknowledged the inability of the triple helix model to take into consideration the differences that exist between developed and developing countries. Whetten (2009) also affirmed that the triple helix model has not been fully developed to take into account the context effect, which includes surrounding factors that influence the implementation of the model. Also, the triple helix model does not regard the social settings of the environment. Its formation is based on three institutions: universities, industry and government. This formation leaves out the role of society in supporting student self-employment (Viale and Pozzali, 2010). Consequently, the supportive role of the societal structure, for example, family, friends and members of the society are left out in the principles in which

the triple helix model is formed. The exclusion of family, friends and members of society in the triple helix model is a major shortcoming. Family, friends and members of society usually play a significant role in the success of self-employed students. Thus, self-employed students require social support, for example, financial, spiritual and emotional support. Other authors also argued that the triple helix model lacks a solid theoretical foundation to stand on (Shinn, 2002; Cooke, 2005). The model is based on the cooperation of universities, industry and government. However, there are no significant empirical tests that were carried out before the approval of the model. Also, the static and laissez-faire triple helix models have fundamental weaknesses in their operation. The static triple helix model leaves much power in the hands of the government such that the autonomy of universities and the industry is compromised. On the other hand, the laissez-faire triple helix model operates within a loosely defined framework making it difficult to make the three stakeholders accountable. However, despite the criticism laid on the triple helix model, it remains the most functional model in studies involving cooperation among universities, industry and government. The next section provides an argument in favour of the triple helix model.

3.3.1.3 Argument in favour of the triple helix model

The triple helix model remains the most applicable theory to follow for countries seeking to follow the most progressive policies for economic development. Therefore, the point raised by Cai (2014) that the triple helix model was founded on the experiences of the Western developed countries is insignificant. For many years, the Western developed world has led the development of models that have added value to developing countries, for example, the theory of planned behaviour developed by Icek Ajzen from Poland (Ajzen, 1991). Despite its development in the Western world, the theory of planned behaviour has remained useful in different countries, including those in the developing world. It should also be realised that the national context does not diminish the usefulness of the triple helix model. Each country has its context that requires the triple helix model to be adjusted to apply to the research environment. Consequently, the point raised by Balzat and Hanusch (2004) regarding how the triple helix model may fail to fit in every national context is not a significant problem, especially when adjustment can be tolerated. As already indicated, the triple helix model needs to be adjusted for each specific context that it is applied. Viale and Pozzali (2010) pointed out that one of the weaknesses of the triple helix model is that it does not consider society. It should be noted that society is not an institution that operates at the same level as universities, industry and government. Cai and Lattu (2002) also argued that even though society is important, it does not have a well-established structure that can stand at the same level as universities, industry and government. This study also recognises the importance of society through the inclusion of social support that is grounded in social capital theory (see section 3.1). Based on the aforementioned reasoning, the quadruple model that

accommodates the society as a fourth helix fails to consider fundamental principles that have been raised in this section. About the criticism of the static and laissez-faire models, it should be realised that the balanced triple helix model provides all the stakeholders with an opportunity for equal contribution. Therefore, the balanced triple helix model remains the most applicable theory to test university initiatives, industry support and government support. The next section presents the entrepreneurial action theory which grounded student self-employment in this study.

3.3.2 Entrepreneurial action theory

As already indicated in this study, the entrepreneurial action theory represents student self-employment. Alonso et al. (2020) alluded to the point that entrepreneurial action theory is based on the premise that the entrepreneur's behaviour is a result of judgemental decisions that are made in times of uncertainty. This notion of entrepreneurial action theory is supported by Hunt et al. (2022) who conceded that entrepreneurial action is a behaviour in response to judgemental decisions made under uncertainty on a possible opportunity for profit. Alonso et al. (2020) and Hunt et al. (2022)'s explanation of entrepreneurial action theory is partly bounded by the entrepreneur's behaviour. In the case of the current study, entrepreneurial behaviour refers to student self-employment. Alonso et al. (2020) and Hunt et al. (2022) further explicated that entrepreneurial behaviour is a response to judgemental decisions. Consequently, judgemental decisions should be considered critical in the entrepreneurial action theory. This is an indication that student self-employment occurs after a judgemental decision. One could argue that a judgemental decision is made out of rationality.

The idea of rationality in making a judgement is supported by numerous authors, for example Brown, Packard and Bylund (2018), Lerner, Hunt and Dimov (2018), and Packard and Bylund (2021). Brown et al. (2018) argued that any entrepreneurial action, such as student self-employment, is preceded by some form of rationality. Packard and Bylund (2021) elucidated that rationality is the founding tenet of entrepreneurial action theory. Foss and Klein (2012), Lerner et al. (2018), and Berglund, Bousfiha and Mansoori (2020) agreed that rationality is a fundamental component for making entrepreneurial action. Zellweger and Zenger (2021) also affirmed that entrepreneurial action is subjected to reasoned intentionality, involving the deployment of intended rational heuristics. In simple terms and in the context of the current study, students are bound to reason or see the logic behind their decision for engaging in self-employment. Such reasons could stem from the need to earn an income, profit, social status and independence. Consequently, when such reasons are strong, the desire to engage in entrepreneurial action also becomes strong.

To further strengthen the aforementioned argument, Lerner et al. (2018) affirmed that the entrepreneurial action theory is established in reasoned purposive actions emanating from discovery,

creation, imagination, effectuation, judgement-based belief development and design. The concept of discovery within the entrepreneurial action theory signifies that one has to locate a gap within the market for successful entrepreneurial action to take place (Kirzner, 1997; Shane and Venkataraman, 2000). Also, indicated as important is the aspect of creation, this entails that one should be creative to serve the identified gap; however, such creativity does not come with a sense of imagination. Klein (2008) pointed out that imagination is an important concept in the entrepreneurial action theory. Imagination refers to the process of forming new ideas that are otherwise not yet in existence in human interactions (Asma, 2022). What is also brought forward in the explanation of the entrepreneurial action theory is the concept of effectuation (Sarasvathy, 2001a, 2001b). Lerner et al. (2018) also expressed effectuation as one of the key concepts important within the entrepreneurial action theory. Effectuation is referred to as the process that entrepreneurs (self-employed students) go through to develop ventures. That process requires a set of skills to overcome possible challenges that may arise.

Before losing sight of the explanation of the concept *entrepreneurial action theory*, attention must be taken back to the points on uncertainty made by Alonso et al. (2020) and Hunt et al. (2022). Even though student self-employment, which is a form of entrepreneurial action, is driven by judgemental decisions made out of rationality, it should be remembered that uncertainty is always at play. Uncertainty refers to the state of the unknown, unpredictable and unreliable. Entrepreneurial action should still occur even when the environment is bounded by uncertainty. Acting in an uncertain environment comes with some level of risk tolerance. This explains why some students would engage in self-employment while others prefer not to. This notion is explained by schools of thought that argue that rationality does not always precede an entrepreneur's decision (Austin and Pisano, 2017). Students who engage in self-employment even when the environment is marked with uncertainty, do not act out of rationality but other factors have an influence. Austin and Pisano (2017) argued that entrepreneurial action is subjected to forces that are not solely grounded on rationality but underlying emotional processes such as gut feeling. However, after taking a risk to take entrepreneurial action in an uncertain environment, entrepreneurs understand the importance of transforming the unknown into the known (Shepherd, 2015). This is achieved through taking novel entrepreneurial actions towards the uncertain business environment. Such an uncertain business environment can refer to suppliers, customers, intermediaries, competitors and the government. Thriving within this uncertain environment requires an entrepreneur, for example, self-employed students to take entrepreneurial action such as conducting an environmental analysis. This is done to have an understanding of the strengths, weaknesses, opportunities and threats posed by the business environment. It is for this reason that the entrepreneurial action theory is linked to student self-employment.

Entrepreneurial action theory is not only explained along the lens of judgemental decisions and uncertainty but also the creation and maximisation of opportunity. Alvarez and Barney (2007) believed that entrepreneurial action is any activity that a person engages in to create and maximise opportunities. Klein (2008) argued that opportunities are manifested in entrepreneurial action, for example, student self-employment. Davidsson (2015) also reiterated that entrepreneurial action is subject to the existence of opportunities. Thus, engaging in self-employment allows students to tap into existing opportunities, for example, making profits out of the trade of products and services. Entrepreneurial action theory is also rooted in sociological theories of actions developed by Weber (1947), Parsons, Shils and Smelser (1951), Giddens (1979), Parsons (1980), Coleman (1986) and Archer (1995). These philosophers have developed theories that explain the reasons behind taking entrepreneurial action, such as student self-employment in the current study (Kim, Wennberg and Croidieu, 2016).

Entrepreneurial action theory is also understood when explained in the context of other factors that affect entrepreneurial action. Such factors can include the role of the agency (McMullen and Shepherd, 2006), macro-environmental structures (Landstrom and Harirchi, 2018), and resources (Baker and Nelson, 2005). The agency refers to the people working on behalf of the entrepreneur. This also applies to student self-employment where a self-employed student hires employees to perform certain functions of the business operation. The effectiveness of the agency can determine whether critical entrepreneurial action is taken or not. The macro-environment structures are also critical in the determination of entrepreneurial action (Landstrom and Harirchi, 2018). Thus, entrepreneurial action is subjected to political, economic, social, technological, environmental and legislative environments. This explains why it is important for successful entrepreneurs to take action aimed at understanding opportunities and threats surrounding the macro-environmental structure. Entrepreneurial action is also determined by the level of resources available (Baker and Nelson, 2005). Without resources, students are not able to engage in self-employment.

3.3.2.1 Stages of entrepreneurial action theory

The stages of entrepreneurial action theory are illustrated in the model of perceived uncertainty and motivation by McMullen and Shepherd (2006). In this model, two distinct stages are identified, namely the attention stage and the evaluation stage. These stages are critical in understanding the fundamental principles of the entrepreneurial action theory (Alonso et al. 2020). The attention stage is described in the next subsection.

STAGE 1: ATTENTION

The attention stage occurs when an entrepreneur becomes aware of an opportunity. This can be linked to the concept of discovery that has been explained in the third paragraph of section 3.3.2. When relooking at the concept of discovery, one would realise that it provides a good fit to the current section. Thus, a self-employed student who is an entrepreneur in this study gives attention to what he or she has discovered (Mitchell and Shepherd, 2010). Such discovery creates the required knowledge for the entrepreneur. McMullen and Shepherd (2006) and Shepherd and Patzelt (2011) argued that domain-specific knowledge triggers some responses to a particular entrepreneurial situation. In the case of this study, such a situation refers to an entrepreneurial opportunity such as student self-employment. The obtained knowledge is, therefore, used in the process of making a rational judgement towards student self-employment (Alonso et al., 2020). The attention stage is also linked to the concept of rational judgement which is a fundamental principle within the entrepreneurial action theory as indicated in the first paragraph in section 3.3.2. In their model, McMullen and Shepherd (2006) and McMullen (2015) suggested three critical dimensions, namely prior knowledge, personal strategy and third-person opportunity. The dimension of prior knowledge has already been explained as fundamental in influencing entrepreneurial action. What has not been sufficiently explained is a personal strategy about the entrepreneurial action theory. Personal strategy refers to the actions that one takes upon discovering an existing opportunity. Lerner et al. (2018) linked personal strategy to effectuation, which is a concept explained in the third paragraph of section 3.3.2. Taking into consideration the explanation provided to effectuation, entrepreneurs such as self-employed students need to take entrepreneurial action through a defined personal strategy to achieve success. The third-person opportunity generally refers to the opportunity discovered by the entrepreneur.

STAGE 2: EVALUATION

The evaluation stage is the last dimension within the stages of the entrepreneurial action theory. This stage questions why opportunities are recognised and acted upon by certain individuals (Mitchell and Shepherd, 2010). A glimpse of this evaluation stage has been given in the explanation of uncertainty as provided by Alonso et al. (2020) and Hunt et al. (2022). In this explanation, it is indicated that risk-taking individuals take entrepreneurial action even when the opportunity is clouded with uncertainty. This also helps to answer the question of why some individuals take on an opportunity, while others do not. Individuals who take on opportunities are entrepreneurs who are classified as risk-takers. These individuals are not only controlled by rationality but also by deep emotional processes such as their gut feeling (Austin and Pisano, 2017). The second stage within the entrepreneurial action theory

also explains the steps that follow after the discovery of an opportunity. Thus, the discovery of the opportunity is followed by an evaluation stage (Autio and Fu, 2013). Within this evaluation stage, three further dimensions are indicated, namely feasibility assessment, desirability assessment and entrepreneurial action. Feasibility assessment refers to a preliminary investigation to understand the pros and cons of taking entrepreneurial action. On the other hand, desirability assessment investigates how the target market perceives the tastes and the aesthetics of the product or the service. These stages are important as they assist the entrepreneur to move from the unknown to the known. As already indicated in the fourth paragraph of section 3.3.2, entrepreneurial action involves the process of transforming the unknown into the known (Shepherd, 2015). Such transformation requires both feasibility and desirability assessment. After these assessments have been performed, further entrepreneurial action, for example, student self-employment may take place.

3.3.2.2 Criticism towards the entrepreneurial action theory

The entrepreneurial action theory plays a significant role in explaining student self-employment. However, it goes without criticism. Authors such as Packard and Bylund (2021) and Zellweger and Zenger (2021) bemoaned the fact that entrepreneurial action theory overly delineates the central role of rational intentionality. This excessive focus on rational intentionality sidelines other crucial factors that contribute to entrepreneurial action. Besides rationality, other factors are equally important in the determination of entrepreneurial action. The influence of internal biological factors is not explicitly explained in the entrepreneurial action theory. Internal biological factors refer to emotional processes such as gut feeling that occurs when an entrepreneur makes decisions without any rational involvement. Although paragraph four in section 3.3.2 attempts to engage the aspect of emotional processes as an influence on entrepreneurial action, the explanation is only driven from a point of view of risk-taking. Thus, emotional processes are not brought into the explanation of entrepreneurial action theory in a primary discussion. This weakness needs to be addressed in the body of knowledge so that it is understood that entrepreneurial action is not only caused by rationality but also other underlying factors that include emotional processes, such as gut feeling. Researchers such as Wolfe, Patel and Drover (2020), Greidanus and Liao (2021) and Rajah, Bamiatzi and Williams (2021) affirmed that recent empirical findings indicate exceptions to the rationality assumptions. Such empirical evidence strengthens the point that entrepreneurial action is not only a result of rationality. Lerner, Hunt and Dimov (2018) and Van Lent, Hunt and Lerner (2020) also argued that the entrepreneurial action theory has failed to empirically engage its assumption of rational intentionality in light of the counter-recent empirical findings. To address this gap, it should be recognised in the literature that entrepreneurial action is caused by a variety of factors and some fall outside the realm of rational intentionality.

3.3.2.3 Arguments in favour of the entrepreneurial action theory

Despite the criticism against the entrepreneurial action theory, it remains the most applicable theory in the study involving student self-employment. The criticism given in the previous subsection takes nothing from the principle of entrepreneurial action in which the entrepreneurial action theory is founded (Alonso et al., 2020). Consequently, the entrepreneurial action theory is still about entrepreneurial action which corresponds to student self-employment. It should be noted that student self-employment translates to entrepreneurial action and this makes the entrepreneurial action theory a good fit (Hunt et al., 2022). Apart from the aforementioned argument, elements that form the entrepreneurial action theory, for example a judgemental decision made under uncertain conditions, still applies in the current study (Austin and Pisano, 2017). As already explained in section 3.3.2, a self-employed student needs to make a judgemental decision that influences whether to engage in a particular business venture or not. The criticism of entrepreneurial action theory in the previous subsection does not argue against rational intentionality but the inclusion of other non-rational factors. Hence, the entrepreneurial action theory remains relevant despite its criticism of the failure to efficiently account for these non-rational factors (i.e., emotional processes). In line with this argument, student self-employment is also guided by rational intentionality. A typical student needs to make decisions based on rationality which makes the use of entrepreneurial action theory viable in the current study. The next section presents the human capital theory.

3.3.3 Human capital theory

The human capital theory provides the theoretical grounding for entrepreneurial competence in the current study. The human capital theory was first developed in 1963 by Schultz to explain the development of skills needed to increase productivity (Raphael, 2020). In 1964, human capital theory was further developed by Berker (Alrifa and Raju, 2019). According to Oluseye et al. (2017), the human capital theory is defined as a theory that champions education as a mechanism to improve human capital needed for productivity and technology stimulation across the world. Bae, Qian, Miao, and Fiet (2014) described human capital theory as a theory that encourages the acquisition of skills and knowledge through schooling, on-the-job training and other formal or informal experiences. Alrifa and Raju (2019) argued that the human capital theory is invested in the notion of education provision with the purpose to build knowledge, skills and abilities needed to perform jobs in a manner that increases productivity.

The definitions of human capital theory proffered by Bae et al. (2014) and Alrifa and Raju (2019) are connected to building knowledge, skills and abilities. In the case of this study, these knowledge, skills and abilities are referred to as entrepreneurial competence. Thus, the human capital theory supports

the development of entrepreneurial competencies since they are referred to as knowledge, skills and abilities in the definitions provided by Bae et al. (2014) and Arifa and Raju (2019). In their definition, Bae et al. (2014) moved on to indicate how these knowledge, skills and abilities (entrepreneurial competencies) are acquired. Bae et al. (2014) outlined that knowledge, skills and abilities are acquired through a process of schooling, on-the-job training and formal or informal experiences. This articulation opens up other interesting avenues within the definition of the human capital theory. The first avenue is that knowledge, skills and abilities referred to as entrepreneurial competencies in this study are acquired through a process of schooling. The process of schooling should remind one of the initiatives of universities (see section 3.3.1 on the triple helix model) in building entrepreneurial competencies. Consequently, the initiatives of universities are brought into prime light within the discussion of the human capital theory and entrepreneurial competencies. Another avenue for attention is the aspect of on-the-job training as another method through which entrepreneurial competencies can be acquired. On-the-job training refers to the process through which students gain knowledge, skills and abilities from the industry. One should also not forget that on-the-job training is not limited to the industry but also the government. This means that both the industry and the government can contribute to entrepreneurial competencies through on-the-job training such as internships. The third avenue brought forward by Bae et al. (2014) is that the acquisition of entrepreneurial competence within the human capital theory does not always have to be through formal experiences but also informal. Thus, entrepreneurial competencies are also achieved through informal experiences. Informal experiences can refer to learning that occurs outside a formal learning and teaching environment provided by universities, industry and government. Thus, the interaction of self-employed students with the world can lead to the accumulation of such informal experiences. However, Bae et al. (2014) observed a significant weakness through their failure to indicate the significance of acquiring skills (i.e., entrepreneurial competencies). While Oluseye et al. (2017) and Arifa and Raju (2019) linked the acquisition of skills to productivity, Bae et al. (2014) were quiet about the implications of knowledge acquisition.

The explanations of the human capital theory provided by Oluseye et al. (2017) and Arifa and Raju (2019) are similar in their attention to productivity. These authors argued that the human capital theory advocates towards the improvement of productivity (Oluseye et al., 2017; Arifa and Raju, 2019). This argument is in line with the fundamental basis of entrepreneurial competencies and what it stands for. Entrepreneurial competencies are referred to as a necessary condition for stimulating productivity within student self-employment. Based on this argument, the human capital theory is directly related to entrepreneurial competencies. Although Oluseye et al. (2017)'s definition is similar to that of Arifa and Raju (2019) in the sense of productivity, it has its differences. Such differences are

highlighted by the expression of the improvement of human capital as one of the tenets within the definition provided by Oluseye et al. (2017). In the context of this study, human capital is built within self-employed students through the acquisition of entrepreneurial competencies. Based on this background, the human capital theory is relevant in the explanation of entrepreneurial competencies.

3.3.3.1 Criticism of the human capital theory

The criticism on the human capital theory is driven by its principles of the advancement of knowledge of people. Scholars argue that the improvement of skills and abilities for certain individuals has resulted in the creation of an unequal society (Blaug, 1985; Gachie, 2020). Societies that are predominantly unequal where there is a gap between the rich and the poor continue to suffer when a few elites have the opportunity for improving their knowledge. Consequently, the human capital theory faces enormous criticism due to the mechanisms that favour those with resources to continuously improve themselves while those without, remain behind (Blaug, 1985). This situation is quite common in developing countries due to the unfair distribution of resources. The human capital theory does not have consideration for this problem. The theory assumes that everyone in society has opportunities for improving knowledge, skills and abilities. In the context of the current study, not all students are exposed to opportunities to improve their entrepreneurial competencies due to inequalities in society. Hence, due to this inequality, a gap is created between those with skills and those without. The human capital theory also assumes that receiving knowledge automatically leads to productivity. This should be regarded as one of the shortcomings of the theory because receiving an education does not necessarily make someone a productive individual. Badawi et al. (2019) argued that the human capital theory is criticised for its inability to measure how training and education improve the quality of labour. It is further pointed out that students may receive an abundance of theoretical entrepreneurial education but fail to translate it into successful business ventures. However, despite the criticism identified within the human capital theory, it remains the most applicable to provide theoretical grounding on entrepreneurial competencies. The next section presents the justification for using the human capital theory.

3.3.3.2 Arguments in favour of the human capital theory

Although the human capital theory has been criticised for its shortcomings, it remains the most relevant theory to explain entrepreneurial competencies. It has been indicated that the human capital theory does provide a direct measure between education and productivity (Badawi et al., 2019). However, it remains understandable that the enhancement of human capital through education contributes to economic development. Oluseye et al. (2017) contended that knowledge economies, for example, Hong Kong, South Korea, Singapore and Taiwan, have gained economic momentum

against the backdrop of education. In line with this argument, the human capital theory is quite critical since it advocates for the development of knowledge required for economic development. In the context of the present study such knowledge can be signified through entrepreneurial competencies. The human capital theory also provides sufficient theoretical grounding for entrepreneurial competence. Another justification towards the human capital theory is that it supports the notion that human capital improvement occurs as a result of investment in education and training (Ramalu, Nadarajah and Aremu, 2020). In the context of the current study, it is expected that investment in the education and training of students results in entrepreneurial competencies. This makes the use of human capital theory relevant to this study. It should also be noted that the human capital theory is based on the principle that education results in the improvement of labour productivity (Moses, Olokundun, Akinbode, Agboola and Inelo, 2016). This is linked to the current study in the sense that the improvement of entrepreneurial competencies contributes to the development of student self-employment. Sweetland (1996) confirmed that there are economic benefits when a society invests in its people. In the case of this study, investment refers to education and training given to students to improve entrepreneurial competencies. Zozimo, Jack and Hamilton (2017) and Rajchamaha and Papojanasomboon (2021) argued that human capital is one of the most important assets for successful entrepreneurship. This also entails that human capital is critical for effective and efficient student self-employment. Based on the aforementioned arguments, the current study adopted the human capital theory to ground entrepreneurial competencies. The next section presents the social capital theory.

3.3.4 Social capital theory

The social capital theory provides the theoretical grounding for social support in this study. According to Rajchamaha and Papojanasomboon (2021), the social capital theory is based on the premise that relationships are a resource and a source of competitive advantage. In support of this argument, Neneh (2022) stated that social capital theory explains the significance of networks as a mechanism to accumulate knowledge, information and resources required to explore opportunities. Seyoum, Chinta and Mujtaba (2021) defined social capital as some form of asset that is driven by the entrepreneur's relationships. Davey et al. (2016) described social capital as a foundation for the creation of a network of entrepreneurs so that they help each other with resources. The definitions of social capital theory presented by Rajchamaha and Papojanasomboon (2021) and Seyoum et al. (2021) and Neneh (2022), are similar in the sense that they both regard social capital as a source of resources and assets for an entrepreneur. This means that entrepreneurs with well-established relationships are in a position to acquire assets from their networks. Such networks may include family, friends and society who can provide resources to the entrepreneur who, in the case of the current study, is a self-employed student. Apart from the expression of resources as one of the significant benefits that an

entrepreneur can get from social capital, Rajchamaha and Papojanasomboon (2021) argued that such resources are a source of competitive advantage. Thus, a self-employed student who has access to resources or assets has a distinct competitive advantage. Resources and assets are a source of competitive advantage because they add to the processes and systems of the operations of student self-employment. Neneh (2022) argued that knowledge, information and resources obtained from social capital are critical in exploring opportunities. Based on this argument, it is clear that social capital is required when self-employed students are seeking to pursue entrepreneurial opportunities. However, it seems as if Davey et al. (2016) limited social capital to a stream of relationships among entrepreneurs. This is not completely accurate because the definition of social capital is broader to include relationships that an entrepreneur has with family, friends and society. The criticism towards social capital theory is given in the next section.

3.3.4.1 Criticism towards the social capital theory

The social capital theory has been criticised for lacking a general agreement in its definition, dimensions and measurement. While some authors define social capital as a network of relationships among entrepreneurs (Davey et al., 2016), others position it as a resourceful connection between family and friends (Sahban, Ramalu, and Syahputra 2016; Rajchamaha and Papojanasomboon, 2021; Neneh, 2022). There are also variations in the manner in which social capital is measured. Levesque (2014) measured social capital through instrumental support, information support and emotional support. On the other hand, Sahban et al. (2014) measured social support as advice, guidance and assistance provided by a social group. Such variability in the measurement of social capital has led to confusion in the manner in which social capital is understood. Confusion has been contributed by the ambiguity and variability in the measurement of social capital. Engbers, Thompson and Slaper, (2017) also indicated that some of the constructs used in social capital are difficult to measure. While some aspects are objective, some have been regarded as subjective (McShane, Turnour, Thompson, Dale, Prideaux and Atkinson, 2016). Authors such as McShane et al. (2016) have indicated that social capital is nothing but a metaphor highlighting the position and production aspect of sociability that lacks capital. Fine (2002) further indicated that social capital theory is not social, not capital and not theory. This leaves the theory with no tangible substance, which purports authors to regard the social capital theory as fundamentally flawed (Fine, 2002; Engbers et al. 2017). It is also highlighted that while some of the constructs used to measure social capital are cognitive, others are non-cognitive (Bourdieu, 1986). Another criticism came from Woolcock (1998) who indicated that social capital can be rational, pre-rational and non-rational. This is an indication that social capital signifies more of an umbrella concept than a theory.

3.3.4.2 Arguments in favour of the social capital theory in this study

Despite the criticism put on the social capital theory, it remains the most applicable theory in the current study. Claridge (2018) posited that the criticism of the social capital theory has not stopped the use and applicability of the theory. The social capital theory has continued to be applied in a multitude of studies where social relationships are concerned (Klyver, Honig and Steffens, 2018; Seyoum et al., 2021; Neneh, 2022). The social capital theory seems almost immune to the criticism against its existence. Criticism of the social capital theory should be rendered both valid and invalid depending on the theoretical perspective being pursued. While critics such as Fine (2002) argued that social capital is not social, it is not true in the case of this study where its conceptualisation stems from support driven by family and friends. Criticism on social capital theory stifles theoretical debate, especially when it is tolerated blindly without a consideration of the theoretical perspective in which it is applied. There is potential for confusion when authors engage in a debate that undermines the applicability of the social capital theory without an appreciation of the context concerned. It should be noted that the popularity and applicability of the social capital theory continue to skyrocket despite the existence of criticism of the theory. This study, therefore, applies the social capital theory to explain the concept of social support. The relevance of the social capital theory in this study is attributed to its conceptualisation that positions social support to be critical in student self-employment. Following this line of argument, the social capital theory was applied to provide theoretical grounding on social support from family, friends and society as conceptualised in this study.

3.4 Constructs of the study

As already indicated in Chapter 1 (see section 1.10, conceptual framework), the key constructs of the study include university initiatives, student self-employment, entrepreneurial competence, industry support, government support and social support. Section 3.3 has also shown that these constructs are grounded in four theories, which include the triple helix model, the entrepreneurial action theory, the human capital theory and the social capital theory (Champenois and Etzkowitz, 2018; Alrifa and Raju, 2019; Alonso et al., 2020; Rajchamaha and Papojanasomboon, 2021). This section seeks to provide an analysis of the constructs of the study. Presented next are the university initiatives.

3.4.1 University initiatives

This section focuses on university initiatives since it is one of the key constructs that predict student self-employment. As already indicated in section 3.3, university initiatives are grounded in the triple helix model (Champenois and Etzkowitz, 2018). Universities refer to institutions of higher learning mandated to carry out teaching and learning leading to the attainment of an academic qualification

(certificate, diploma and degree). The mandate of universities also includes academic research and community engagement (Gachie, 2020). It should be noted that the first university class in entrepreneurship started in 1940 (Katz, 2003). However, at this time entrepreneurship was not yet recognised as a discipline of study. It was only in the 1960s that universities started to recognise entrepreneurship as a discipline (Gartner and Vesper, 1994). Professors in entrepreneurship also began to emerge to strengthen the outcomes of the discipline. Entrepreneurship in universities continued to develop across the world over the years. By 2006, there were approximately 2 220 entrepreneurial courses at over 1 600 universities and colleges worldwide (Hisrich, 2006). This was an enormous growth of entrepreneurship education as a discipline within education. As a discipline, entrepreneurship continued to grow within universities.

Universities are positioned to provide suitable initiatives towards student self-employment. Liu, Gorgievski, Qi and Paas (2022) argued that universities position themselves as seedbeds for establishing a conducive entrepreneurship environment. The promotion of an entrepreneurship environment is achieved through performing its mandate of teaching, learning and research in line with entrepreneurial goals (Coduras, Urbano, Rojas and Martínez, 2008; Saeed et al., 2015). Apart from linking curriculum with entrepreneurship, universities support the concept of academic spin-offs where members of the academic community, for example, staff (assistants, researchers, professors) and students establish businesses (Feola et al., 2019). Academic spin-offs are businesses that are born out of the university environment due to the level of entrepreneurial support provided. Siegel and Wright (2015) and Samo and Huda (2019) admitted that universities are responsible for the production of academic spin-offs due to the support entrepreneurial environment.

It should be noted that universities create a supportive entrepreneurial environment through the development of entrepreneurship policies. Fini, Grimaldi, Santoni and Sobrero (2011) claimed that the establishment of entrepreneurship policies has assisted universities to become entrepreneurial. This is in line with the argument made by Brem and Radziwon (2017) and Cai and Etzkowitz (2020) that universities are receiving attention for their role as mediators in fostering entrepreneurship. In fostering entrepreneurship, universities need to provide entrepreneurial education and a supportive environment to thrive. Liu et al. (2022) pointed out that it is the responsibility of universities to guide students to become aware of entrepreneurship as a possible career option. Such awareness will drive students into self-employment. However, it should not only be the provision of entrepreneurship awareness as a career option but further support to ensure that student self-employment becomes successful. Liu et al. (2022) added that universities should use their reputation to support student self-employment. The university's reputation can be put to use by securing markets from various stakeholders for students who are into self-employment. Also, universities can provide financial

support to facilitate student self-employment (Liu et al., 2022). The next section justifies the adoption of university initiatives in this study.

3.4.1.1 Justification for applying university initiatives in the study

This study found university initiatives to be suitable for this study for a variety of reasons. Authors in entrepreneurship education have continued to hail university initiatives as fundamental in stimulating student self-employment (Ayalew and Zeleke, 2018; Cox, Mueller and Moss, 2020; Su et al., 2021). University initiatives provide benefits such as building entrepreneurial knowledge, linking students with important stakeholders, assisting with financial assistance, provision of a market and entrepreneurship experience. It is based on these benefits that student self-employment can thrive. Cox et al. (2020) articulated that university initiatives are important due to their aim to improve entrepreneurship knowledge among students. Through initiatives, universities can develop an entrepreneurship curriculum that improves student knowledge, skills and abilities in entrepreneurship. Apart from its ability to improve student knowledge, university initiatives link students with important stakeholders. Saeed et al. (2015) agreed with Liu et al. (2022) that university initiatives play an important role in linking students with important stakeholders, for example, the government and the industry. This is fundamental in influencing the success of student self-employment. Also, university initiatives contribute to the financing of student self-employment. The financing of student self-employment should be considered critical in fuelling student entrepreneurial operations. University initiatives are important in the creation of a market for student self-employment (Kraaijenbrink et al., 2010). Through its initiatives, the university may provide its environment as a trading place for students. The success of student self-employment relies on the availability of a market. As students are allowed to trade on campus, they are also able to gain invaluable experience. Apart from the importance of university initiatives from a practical point of view, researchers have also applied university initiatives in numerous student entrepreneurship education studies (Saeed et al., 2015; Oluseye et al., 2017; Ranabahu et al., 2020). The efficacy of university initiatives has been empirically tested. It is for this reason that the current study applies university initiatives. The next section presents the typology of university initiatives.

3.4.1.2 Measures of university initiatives

This study adopted university initiative measures that include educational support, concept development support and business development support (Kraaijenbrink et al., 2010; Saeed et al., 2015). These university initiatives were found to be fundamental in influencing student self-employment. There is also general agreement in the literature over the use of educational support, concept development and business development as the appropriate measures for university initiatives

(Wegner, Thomas, Teixeira and Maehler, 2019; Shi, Yuan, Bell, and Wang, 2020; Su et al., 2021). Education support initiatives are explained next.

3.4.1.2.1 Educational support

Educational support refers to university initiatives that include the provision of entrepreneurial coaching and mentorship towards students (Kraaijenbrink et al., 2010). Universities provide educational support to build entrepreneurial skills among students. Through the acquired entrepreneurial skills, students will be confident to engage in student self-employment. Cox et al. (2020) concurred that educational support is critical in improving student entrepreneurial capacity. Saeed et al. (2015) added that education support is provided through the provision of elective courses, project work, internships, and conferences focused on entrepreneurship. Universities should ensure that their curriculum is streamlined to improve the entrepreneurial skills of their students. Thus, the content of entrepreneurship elective courses needs to address key issues in entrepreneurship. Key issues to consider in the entrepreneurship elective courses include education that focuses on entrepreneurial competencies, for example, networking and innovativeness (Al Mamun et al., 2019; Sharma, 2019). Thus, coaching and mentorship towards students focus on entrepreneurial competencies since they are important in the development of competent self-employed students. One initiative that universities can put in place to ensure that an entrepreneurial environment is formed is the introduction of an entrepreneurial module that cuts across all the academic programmes. The entrepreneurial module can be offered within the first year of joining the university environment.

In terms of project work, the university ensures that assignments are prepared in such a way that it is delivered in the form of a project. Van Widen (2015) argued that universities should assign students entrepreneurial projects to work with the industry, for example, in the case of the City of Cluj-Napoca where university students teamed with information technology organisations to build entrepreneurial skills. Providing students with project work exposes students to real-world experiences that can build their entrepreneurial potential. Buasuwan (2018) and Rajchamaha and Papojanasomboon (2021) stated that the entrepreneurial curriculum at universities should include special projects and project contests to build the entrepreneurial expertise of student self-employment. Oluseye et al. (2017) highlighted that students should receive recognition and rewards for developing outstanding entrepreneurial projects. This practice is meant to motivate students to engage in innovative entrepreneurial projects.

Internship is also another mechanism that universities use to promote an entrepreneurial mindset among students. Ramalu et al. (2020) indicated that internships are crucial in a supportive environment. Internships involve taking students to organisations so that they become part of the

operations for a specific agreed period. During the internship, students can be taught how to handle marketing, finance and human resources operations of the business. Saeed et al. (2015) argued that the provision of internships is one of the methods that can be used to stimulate the entrepreneurial performance of self-employed students. Ranabahu et al. (2020) outlined that academics need to contribute to developing internship programmes for students. Clark, Rowe, Cantori, Bilgin and Mukuria (2016) pointed out that the contribution of academics during student internship should include teaching, administrative and pastoral responsibilities.

As part of educational support, universities are also expected to offer conferences on entrepreneurship. Saeed et al. (2015) posited that entrepreneurial conferences are fundamental in promoting entrepreneurship among students. Gachie (2020) also stated that university responsibilities include organising conferences, workshops and training for self-employed students. These entrepreneurial conferences work as a point at which students meet and share ideas.

3.4.1.2.2 Concept development support

Concept development refers to the generation of an idea for starting a new product, service or business. This is an important skill for successful student self-employment. It is the responsibility of the university to provide concept development support to its students. This is important in fostering student self-employment. Su et al. (2021) elucidated that concept development support provokes the consciousness, motivation and business thinking mindset among students. It allows students to have an understanding of the business innovation they would want to pursue from the beginning. Saeed et al. (2015) alluded that concept development is measured through the capacity of the university to create awareness of entrepreneurship as a career choice and motivation towards starting a business. Also, it is measured through the ability of the university to provide ideas and knowledge to start a business (Kraaijenbrink et al., 2010). Universities need to put mechanisms in place to ensure that students are aware that entrepreneurship can be pursued as a career choice. This can be achieved when a spirit of entrepreneurship is installed within the university. The development of policies and procedures that encourages student entrepreneurship is one of the ways that can be used by the university to encourage students to take entrepreneurship as a possible career choice (Oluseye et al., 2017; Rajchamaha and Papojanasomboon, 2021). The university should also constantly communicate the idea of taking entrepreneurship as a career choice. Communication can be handled through oral and written mechanisms. In terms of oral communication, students should be informed about entrepreneurship during the orientation, classroom sessions and any other oral communication platform. Apart from oral communication, written platforms can also be applied to ensure that

students get informed of the need to take entrepreneurship as a possible career choice. Such written platforms can include the university website, emails, notice boards and social media.

Apart from providing extensive communication on making entrepreneurship a possible career choice, the university also needs to motivate its students (Saeed et al., 2015). Universities need to make use of the right methods to motivate their students into self-employment. According to Oluseye et al. (2017), students can be motivated into self-employment through the use of special recognition, awards and sponsorship assistance. A policy and procedures should be in place to enforce the use of special recognition, awards and sponsorship assistance to motivate students into student self-employment. Ayalew and Zeleke (2018) argued that entrepreneurship education should be used to motivate students into student self-employment. However, the ability to motivate students into student self-employment only depends on the nature of entrepreneurship education. This comes back to the design of the entrepreneurship education curriculum. The entrepreneurial education curriculum needs to be informative such that it adds value to students. Taatila (2020) reiterated that entrepreneurship education creates a strong internal motivation for entrepreneurship and the desire for student self-employment.

As part of support for concept development, universities should provide students with ideas to start a new business (Kraaijenbrink et al. 2010). To achieve this, the university needs to have platforms where business ideas are discussed. Thus, students need to be invited to such a platform so that they can share their ideas and get guidance from the university. Eesley and Wang (2017) agreed that students need to pitch their business ideas from an early stage so that support can be provided. Li, Li and Lin (2023) and Mitchelmore and Rowley (2013) articulated that universities should have a platform that they can use to generate new business ideas. This will help students to be conscious and motivated towards the development of realistic business ideas. Also, universities can foster the skills to develop business ideas among their students through entrepreneurial workshops. The generation of new business ideas is also stimulated by providing entrepreneurship education. As already indicated, entrepreneurship education needs to be streamlined such that it can stimulate students to develop successful business ideas needed to sustain student self-employment.

3.4.1.2.3 Business development support

Business development support is also one of the initiatives expected from universities to encourage student self-employment (Kraaijenbrink et al., 2010; Saeed et al., 2015). It should be noted that business development support refers to the mechanisms that are put in place by the university to stimulate student self-employment. Kraaijenbrink et al. (2010) declared that business development support is measured through the ability of the university to provide students with financial means to

start a new business. Also, business development support can be instituted by using the university's reputation to benefit students who are pursuing self-employment (Saeed et al., 2015). It is also indicated that business development support is achieved by providing a market for students who are in self-employment (Kraaijenbrink et al., 2010; Saeed et al., 2015). The success of student self-employment depends on the availability of financial support. Kabelele, Banele and Gomera, 2023 (2023) agreed that students need to get financial assistance to prosper in their student self-employment endeavour. Lyver and Lu (2018) conceded that business support should be provided in the form of financial assistance to influence the performance of business operations. Financial resources enable self-employed students to facilitate their operations effectively and efficiently.

The reputation of the university should be applied to the benefit of student entrepreneurial activities. Saeed et al. (2015) indicated that the university should allow students to use its reputation to support business operations. As an institution, universities work with different stakeholders and most of them are suppliers of different services. Strategic universities capitalise on their relationships with these supplier institutions so that their expertise can help students. The University of Pretoria has put a policy in place that companies in its supplier database should provide internships to its students. This is one of the strategies that can be put in place to ensure that maximum benefit is driven by the university's relationships. Some of the suppliers could become customers of student business operations. For example, some students may be into computer software and application development. In the current edge of digitalisation, most companies are looking into unique advancements and students specialising within such trade could benefit. Liu et al. (2022) agreed that universities should use their reputation to benefit the entrepreneurial activities of students.

Besides the use of its reputation to link self-employed students with suppliers, universities can become a lead to customers for the products and services offered by students. Saeed et al. (2015) articulated that universities should act as lead customers for students who are carrying out business ventures. University operations rely on the provision of different products and services. Based on this requirement, an inward-looking approach must be adopted to provide students with an opportunity to trade. However, interested students should be vetted through the normal in-boarding vendor process. The idea of having the university present itself as a customer to self-employed students is supported by Kraaijenbrink et al. (2010). This idea is drawn from the notion that the university itself is a living community that has needs and wants. Hence, student self-employment can be encouraged by allowing students to trade on campus. As already indicated, there should be policies in place to control how students are allowed to trade with and within the university.

3.4.2 Student self-employment

As shown in sections 3.3.2 and 3.4, student self-employment is theoretically grounded in the entrepreneurial action theory. This section, however, seeks to provide a close look at student self-employment as a key construct of the study. Literature that seeks to provide an understanding of the concept of student self-employment is in its abundance. Researchers such as Kristiansen and Indarti (2014), Halvorsen and Howell (2016), Lawrence, Sulthana, Tarko and Genanu (2021), and Salas-Velasco (2023) have contributed with different definitions of student self-employment. Laing (2011) defined student self-employment as a process of running a social or business enterprise either part-time or full-time as a contractor, freelancer, or franchise agent while another one enjoys freedom, independence, a boss title, being rich, and working fewer hours. Meager, Martin and Carta (2011) discerned that student self-employment is associated with independence and autonomy due to the ability of one to work alone. The Organisation for Economic Cooperation and Development (OECD) (2012) referred to student self-employment as an act through which an individual owns an account worker or a person responsible for the production of goods and services. Van Solinge (2014) articulated that student self-employment is synonymous with entrepreneurship so that it covers practices such as consultation, small business ownership and social entrepreneurship. The International Labour Organization (ILO, 2016) defined student self-employment as students who are employers, own-account workers, members of a producer cooperative and contributing family workers. The ILO (2016) goes on to explained that remuneration for student self-employment is directly driven by the profits of products and services. At the same time, own consumption is perceived to be part of the profits. Halvorsen and Howell (2016) stated that student self-employment is defined as a practice through which a student works for himself or herself without reporting to any person or an organisation. Raphael (2020) indicated that student self-employment is a condition where students works for themselves while enjoying independence and autonomy. Lawrence et al. (2021) regarded student self-employment as a condition in which one is a sole trader or part of joint businesses of an unincorporated enterprise. Salas-Velasco (2023) described student self-employment as a practice of graduates who regard themselves as entrepreneurs with or without employees who base trade on their profession.

Multitudes of definitions have been presented by both researchers and organisations indicating how widely student self-employment is defined (Laing, 2011; Meager et al., 2011; OECD, 2012; Van Solinge, 2014; ILO, 2016; Halvorsen and Howell, 2016; Raphael, 2020; Lawrence et al., 2021; Salas-Velasco, 2023). Laing (2011), Meager et al. (2011), Halvorsen and Howell (2016) and Raphael (2020) agreed that student self-employment is characterised by independence and autonomy. Laing (2011) also agreed with Van Solinge (2014) that student self-employment can be within the lens of social

entrepreneurship. This indicates that students may choose to focus on a business that concentrates on social impact. The definitions of the OECD (2012) and ILO (2016) of student self-employment are unique in the sense that they bring up ownership of employees. This shows that student self-employment contributes to the creation of employment for people other than the student who owns the venture. Fundamental aspects coming out of the definitions presented by Laing (2011), Van Solinge (2014), Lawrence et al. (2021) and Salas-Velasco (2023) is that student self-employment is entrepreneurship. This notion is further substantiated by Laing (2011), Van Solinge (2014) and ILO (2016) who affirmed that student self-employment is entrepreneurship because it involves participation in contracting, cooperatives, consultation, franchising, sole-trading, and joint businesses. The aforementioned point shows that student self-employment is comprised of entrepreneurial action; hence, it is grounded in the entrepreneurial action theory. The next section justifies student self-employment inclusion in the study.

3.4.2.1 Justification for the inclusion of student self-employment

The concept of student self-employment has generally garnered support across the world due to its importance to socio-economic performance. Chapter 2 discussed at length how different parts of the world have embraced student self-employment. Researchers found student self-employment to be important towards increasing job opportunities, creation of wealth, stimulating innovation, increase in market competition and poverty reduction (Hamid, Hengchao and Mhd-Sarif, 2017; Hamdan, Khamis, Al Hawaj, and Barone, 2019). Student self-employment is synonymous with entrepreneurship. Student self-employment involves running business operations that result in the trade of products and services. Such operations require human resources so that work gets to be carried out most effectively and efficiently. Consequently, student self-employment leads to the generation of employment opportunities (Hamdan et al., 2019). The importance of student self-employment is also highlighted through its contribution to the generation of wealth. Through their entrepreneurial operations, students can increase their income. Thus, such an increase in income results in the generation of wealth, even among the poor. Abel-Koch, Del Bufalo, Fernandez, Gerstenberger, Lo, Navarro and Thornary (2015) affirmed that entrepreneurship, for example student self-employment, results in wealth creation. The participation of students in entrepreneurship through student self-employment leads to the creation of innovation. Bertoni, Marti and Reverte (2018) agreed that student self-employment leads to innovation. Through student self-employment, innovation is most likely to be achieved through new products, services, processes and systems. The creation of innovation also results in the improvement of quality of life. As innovation increases, people benefit from its existence. People who consume innovative products and services benefit from innovative designs and styles while employees enjoy innovative processes and systems. Also, the stimulation of innovation due to

student self-employment is important in the creation of market competition. Ahmad and Xavier (2012) admitted that student self-employment increases market competition. The increase in market competition is important for customers. With it comes a decrease in prices and an increase in the quality of products. Based on the aforementioned arguments, student self-employment leads to socio-economic improvement, for example, an increase in the standard of living and a decrease in poverty. It is upon this background that student self-employment was considered as a key construct for this study. The next section presents indicators for student self-employment.

3.4.2.2 Measures of student self-employment

The measures for student self-employment were suggested by Farmer, Yao and Kung-Mcintyre (2009) as the availability of a business plan, business data, communication with stakeholders, connection with investors and presence of a prototype. It is also indicated that student self-employment is measured through the availability of a prototype, understanding of what competitors offer and enough management skills in the business (Farmer et al., 2011). Student self-employment is an example of entrepreneurial action that should be measured through an existing business plan. Zhang et al. (2014) commented that a business plan needs to be in place to achieve successful student self-employment. Mitchelmore and Rowley (2013) also pointed out that businesses act as evidence that student self-employment is being undertaken seriously. Thus, self-employed students with a business plan find themselves with direction regarding the operations of the business. A business plan indicates the steps that will be taken by self-employed students to be successful in their business ventures.

Also, fundamental as a measure for student self-employment is data that is required for a successful business. Business data refers to information that can be used by self-employed students to inform their operations. Farmer et al. (2011) highlighted that successful student self-employment should be measured by the amount of business data available for the operations of the business. Consequently, the effectiveness and efficiency of student self-employment need to be assessed through the level of data that is kept to inform business decisions. Weidenkaff and Witte (2023) pointed out that self-employed students need to have data on customers, competitors, suppliers and other relevant stakeholders. Such data is critical in influencing operational decisions of student self-employment.

It is also indicated that active student self-employment is measured through the ability to communicate with stakeholders. Farmer et al. (2011) posited that self-employed students should communicate their business plans with stakeholders. Such stakeholders may refer to suppliers, investors and employees since they must understand the vision of the business. Gachie (2020) indicated that the involvement of stakeholders is important for developing a competitive advantage.

Consequently, self-employed students that are operating at a level where they have an understanding of relevant stakeholders tend to be ahead in the marketplace.

Information about investors is also critical for achieving successful student self-employment. Self-employed students must research potential investors. In their research, Farmer et al. (2011) concurred that investors are crucial in the growth of SMEs. The interaction of self-employed students with investors is an indication that they are pursuing a bigger vision (Kaiser and Berger, 2021). It is for this reason that this study measures the effectiveness of student self-employment through interaction with potential investors.

The success of student self-employment depends on the innovativeness of the products or services that are offered. Aftab et al. (2022) argued that the business needs to invent product or service inventions that are original and difficult to replicate. The availability of such products or service provides self-employed students with the edge to compete effectively. Lee, Chong and Ramayah (2019) affirmed that a business needs to have competitive products and services to be ahead of the competition. Also, such products and services must be shown to customers so that they become familiar with what is on offer. It is based on the aforementioned arguments that this study measures the student self-employment success and the availability of a product prototype. Another important aspect to consider in the success of student self-employment is the ability to understand competitors (Ismail, Zain and Zuliha, 2015). Understanding what competitors are offering is important for the business because it leads to the assessment of its market position. An assessment of market position also allows self-employed students to improve their operations.

3.4.3 Entrepreneurial competence

In this study, entrepreneurial competence is theoretically grounded in the human capital theory as indicated in sections 3.3.3 and 3.4. Literature shows evidence of the extensive discussion of the definition of entrepreneurial competence (Wright, Clarysse, and Mosey, 2012; Oyeku, Oduyoye, Elemo, Akindoju and Karimu, 2014; Tehseen and Ramayah, 2015; Bolarinwa and Okolocha, 2016; Lans, Baggen and Ploum, 2018). In a time series manner, this section presents and evaluates the definition of entrepreneurial competence. Mitchelmore and Rowley (2010) described entrepreneurial competence as a group of competencies that are useful in generating successful entrepreneurship. Wright et al. (2012) proffered entrepreneurial competence as the ability to start and expand a business venture while effectively recognising and merging a variety of resources. Oyeku et al. (2014) regarded entrepreneurial competence as the degree to which an organisation is willing to take a risk as a means to make it possible to succeed. Tehseen and Ramayah (2015) viewed entrepreneurial competence as intangible and valuable capabilities that are used to generate competitive advantage for SMEs.

Bolarinwa and Okolocha (2016) defined entrepreneurial competence as interpersonal and creative thinking skills that serve as a strategic opportunity for the firm to enhance its competitiveness. Hayter (2016) referred to entrepreneurial competence as a set of individual or organisational skills that are used to utilise resources and information given by the network to achieve entrepreneurial success. Durkin and Gunn (2016) also referred to entrepreneurial competence as the skills, knowledge and abilities of workers that are used to achieve high firm performance. Lans et al. (2018) presented entrepreneurial competence in terms of cognition orientation, function orientation and meta-orientation. Floris and Dettori (2020) defined entrepreneurial competence as a set of skills and abilities that an entrepreneur should acquire, improve and possess to be proactive. Silveyra, Herrero and Perez (2021) explicated that entrepreneurial competence is a set of attributes that makes an individual create a company. Wu (2021) referred to entrepreneurial competence as abilities, qualities, knowledge and skills that are required by individuals to complete entrepreneurial tasks. Wu (2021) added that entrepreneurial competence is a key indicator of successful student entrepreneurial behavioural competence. Entrepreneurial competence is also defined as a set of skills, attitudes and knowledge for innovation, creativity, leadership and the ability to seize opportunities (Crespi, Queiruga-Dios and Queiruga-Dios, 2022). Aftab et al. (2022) also defined entrepreneurial competence as valuable skills and resources that lead to business success. Entrepreneurial competence is defined as a set of skills needed to create, develop, manage and grow a business venture (Possible Works, 2023).

This section shows a variety of attributes used to define entrepreneurial competence. Similarities and differences can be identified in the manner in which the concept is presented. Mitchelmore and Rowley (2010) presented entrepreneurial competence as a group of competencies used to generate successful entrepreneurship. Mitchelmore and Rowley (2010)'s definition provides a hint that competencies that lead to successful entrepreneurship are more than one. Mitchelmore and Rowley (2010)'s definition is somewhat supported by Tehseen and Ramayah (2015), Bolarinwa and Okolocha (2016), Hayter (2016), and Durkin and Gunn (2016) whose definitions show that entrepreneurial competence refers to numerous capabilities, skills and abilities. Consequently, entrepreneurial competence is not influenced by a single attribute but many as indicated in the definitions of Mitchelmore and Rowley (2010), Tehseen and Ramayah (2015), Bolarinwa and Okolocha (2016), Hayter (2016), and Durkin and Gunn (2016).

In their definition, Mitchelmore and Rowley (2010) also showed that entrepreneurial competence leads to the generation of successful entrepreneurship. The positive outcome of entrepreneurial competence is not only reflected by Mitchelmore and Rowley (2010) but also by Tehseen and Ramayah (2015), Bolarinwa and Okolocha (2016), Hayter (2016), Durkin and Gunn (2016) and Crespi et al. (2022)

who indicated that it leads to the creation of competitive advantage, competitiveness, entrepreneurial success, high performance and seizure of opportunities. Adding to the positive outcomes of entrepreneurial competence, Wright et al. (2012) and Possible Works (2023) further indicated that entrepreneurial competence leads to the ability to start, develop, manage and grow a business venture. Furthermore, Wright et al. (2012) argued that entrepreneurial competence leads to the ability to effectively recognise and merge resources required for entrepreneurship success. The link between entrepreneurial competence and effective use of resources was not only shown by Wright et al. (2012), but also by Hayter (2016) and Aftab et al. (2022).

It is also important to note that entrepreneurial competence applies to both individuals and organisations. While Hayter (2016), Bolarinwa and Okolocha (2016) and Lans et al. (2018) linked entrepreneurial competence to a specific entrepreneur, Oyeku et al. (2014) linked it to organisations. Tehseen and Ramayah (2015) referred to entrepreneurial competence as intangible but valuable at the same time. The intangibility of entrepreneurial competence is an indication that this is an asset competitors may find difficult to copy. Hence, it can result in the creation of a competitive advantage for student self-employment. In line with Tehseen and Ramayah (2015)'s argument that refers to entrepreneurial competence as valuable, Bolarinwa and Okolocha (2016) also looked at it as an opportunity. Wu (2021) directly linked entrepreneurial competence to successful student entrepreneurship behaviour. It is for this reason that entrepreneurial competence is one of the key constructs in the current study. The next section discusses the justification for including entrepreneurial competence in this study.

3.4.3.1 Justification for inclusion of entrepreneurial competence

The inclusion of entrepreneurial competence was based on its importance towards entrepreneurial ventures such as student self-employment. Entrepreneurial competence is of great interest to researchers and entrepreneurs alike due to its benefits. Researchers such as Kusmintarti et al. (2016), Peric, Grladinovic, Kropivsek and Greger (2017), Al Mamun and Fazal (2018), Nakhata (2018) and Bosma and Kelley (2019) enunciated that the benefits of entrepreneurial competence include business performance, survival, growth, effective use of resources, profits, problem-solving and innovativeness.

In a highly competitive market, it is difficult for most SMEs to survive. Thus, student self-employment may also find it difficult to survive in highly competitive markets. Mitchelmore and Rowley (2010) argued that the survival of a business requires the use of entrepreneurial competence. Consequently, entrepreneurial competence can be used to hedge against competition. Kusmintarti et al. (2016) confirmed that entrepreneurial competence provides the business, for example student self-employment, the ability to protect itself from a competitive market. Apart from securing survival,

business performance is also achieved out of entrepreneurial competence. Rahman, Ahmad and Taghizadeh (2016) concurred that entrepreneurial competence leads to business performance. Self-employed students with high levels of entrepreneurial competence tend to influence their entrepreneurial ventures to success. Thus, the possession of financial literacy skills, networking and innovativeness prompt a business into success.

Entrepreneurial competence results in the growth of the entrepreneurial venture. Peric et al. (2017) affirmed that the use of entrepreneurial competence such as creativity, good communication and adaptability can assist a business in growth. The growth of the business is influenced by a special set of skills that influences its operations. It is for this reason that Aftab et al. (2022) suggested that entrepreneurial ventures such as student self-employment acquire entrepreneurial competence so that they can achieve growth. Entrepreneurial competence influences growth, for example, production, sales and outlets. The effective use of resources is also influenced by entrepreneurial competence. Mohsin, Halim and Farhana (2017) admitted that the possession of entrepreneurial competence is important for understanding the management of resources. Entrepreneurial competence provides the entrepreneur with skills such as planning, coordinating and organising, which are important in the management of resources. Consequently, entrepreneurs with entrepreneurial skills are effective and efficient in the management of resources.

It should also be noted that entrepreneurial competence results in the attainment of profits within the entrepreneurial venture. Kusmintarti et al. (2016) conceded that the presence of entrepreneurial competence influences the business to acquire profits. It has already been highlighted that entrepreneurial competence results in business performance. Such business performance may translate to an increase in sales, a decrease in cost and an accumulation of profits (Mohsin et al., 2017). Entrepreneurial competence is, therefore, fundamental to the success of student self-employment. It is based on the aforementioned arguments that this study included entrepreneurial competence. The next section presents measures for student self-employment.

3.4.3.2 Measures of entrepreneurial competence

The previous section has presented the salient features carried out in the different definitions of entrepreneurial competence. In their definition, Tehseen and Ramayah (2015), Bolarinwa and Okolocha (2016), Hayter (2016), and Durkin and Gunn (2016) indicated that entrepreneurial competence refers to a set of capabilities, knowledge, skills and abilities. However, these definitions did not highlight specific examples of these capabilities, knowledge, skills and abilities. It is the purpose of the current section to present the measures of entrepreneurial competence. The body of knowledge shows that entrepreneurial competence is measured through the use of various attributes,

skills and abilities, which include risk-taking, critical thinking, problem-solving and innovation (Badawi et al., 2019; Ranabahu et al., 2020). Villa and Poblete (2007) and Kusmintarti, Thoyib, Maskie and Ashar (2016) argued that attributes for entrepreneurial competence are classified into three broad categories, which include instrumental generic competence, interpersonal competence and systematic generic competence. These broad classifications are explained in the next subsections.

3.4.3.2.1 Instrumental generic competence

Instrumental generic competence is referred to as a combination of manual and cognitive capabilities that adds to professional competence (Villa and Poblete, 2007). Manual capabilities are associated with the physical abilities of the entrepreneur. On the other hand, cognitive capabilities are related to mental skills. The combination of physical and mental skills forms instrumental generic competence. The presence of instrumental generic competence leads to the creation of a competitive advantage (Silveyra et al., 2021). Villa and Poblete (2007) outlined that instrumental generic competence includes skills such as decision-making skills, time management, the ability to use new technologies, the ability to find new information, and good information interpretation skills. As already indicated, instrumental generic competence combines manual and cognitive abilities. In this case, manual abilities are related to the use of new technologies, while cognitive abilities stretch to include decision-making skills, time management, the ability to find new information and good information interpretation skills (Villa and Poblete, 2007; Ahmad et al., 2010; Chell, 2013). Villa and Poblete (2007) further indicated that instrumental generic competence refers to the ability to manage and cope with an environment where there are people. It is also related to craftsmanship, physical prowess, cognitive understanding, language skill and academic achievement.

3.4.3.2.2 Interpersonal generic competence

Entrepreneurial competence is also measured through interpersonal competence. Villa and Poblete (2007) referred to interpersonal competence as personal and relational skills. Personal and relational skills relate to a person's ability to interact with others. Entrepreneurship is linked to several stakeholders, for example, customers, employees, suppliers and the government (Ranabahu et al., 2020). Interaction with these stakeholders requires self-employed students to have personal and relational skills. Villa and Poblete (2007) associated personal and relational skills with a person's ability to portray generosity and sympathy towards others. The self-employed students should also be in the position to express their generosity towards the stakeholders so that important connections can be secured. Villa and Poblete (2007) further indicated that interpersonal generic competence is linked to objectification, identification and the ability to report on one's feelings as well as that of others to stimulate social cooperation. Other interpersonal generic competence skills include the ability to

negotiate in a professional environment (Onstenk, 2003), human relations skills (Mitchelmore and Rowley, 2010), networking (Sharma, 2019) and commitment (Kusmintarti et al., 2016).

3.4.3.2.3 Systemic generic competence

Another form of entrepreneurial competence is pointed out as systemic competence (Villa and Poblete, 2007). An entrepreneur's capacity to pursue a global vision and adapt to new environments is correlated with systemic skills. An entrepreneur must be able to think strategically in order to pursue a global vision and integrate into various horizons. The existence of systemic generic competence is signified by the ability to be creative (Bolarinwa and Okolocha, 2016), innovative (Lee et al., 2019), and delegate (Ahmad et al., 2010; Chandler and Jansen, 1992; Mitchelmore and Rowley, 2010). Systemic generic competence is also associated with the ability to motivate others (Mitchelmore and Rowley, 2010), risk-taking (Badawi et al., 2019), flexibility to change (Raphael, 2020), persistence skills (Klyver et al., 2018) and self-confidence (Gelaidan and Abdullateef, 2017). Villa and Poblete (2007) highlighted that systemic generic competence enables the entrepreneur to plan changes that lead to the introduction of innovative solutions. Thus, systematic competence should be regarded as critical for self-employed students who are seeking to improve their competitiveness. The next section presents industry support.

3.4.4 Industry support

The concept of industry support is grounded in the triple helix model theory (see section 3.3.1). The industry is comprised of businesses, which include local SMEs and large enterprises, as well as those that are owned by foreigners (Davey et al., 2016). The Ministerial Review Committee of the South African Department of Science and Technology (2012) placed the industry as the centre for innovation development. Its undisputable role in socio-economic development needs to be extended to student self-employment. Gachie and Govender (2017) stipulated that the triple helix model works effectively when the industry plays its role effectively and efficiently. However, in the South African context, it seems the industry is not being fully given its position to spearhead innovations within the economy. Gachie and Govender (2017) argued that deficiencies in the inclusion of the industry constitute a major drawback in knowledge creation. Despite these weaknesses industry support towards student self-employment needs to be further investigated. Feola et al. (2019) confirmed that cooperation with industry has a positive effect on student entrepreneurship behaviour, for example, student self-employment. The industry plays its role through the provision of financial assistance to encourage academic spin-offs. Feola et al. (2019) further argued that industry support contributes to the creation of start-ups, especially those operating in the same industry. Rached and Shah (2021) also indicated that industry support is required for the acceleration of the implementation of the SDGs. Apart from

its role in the implementation of the SDGs, the industry sector is an important stakeholder under Agenda 2030 for economic growth in South Africa. Lalaguna and Dorodnykh (2018) regarded the industry as an important stakeholder in influencing progress within the SDGs. As part of performing its roles in both the SDGs and Agenda 2030, industry support needs to be partly directed to student self-employment since it is aligned with socio-economic development. It is also argued that the private sector needs to contribute towards the enrichment of student self-employment through the provision of internship programmes (Ranabahu et al., 2020). Internship programmes refer to work-integrated learning opportunities that assist in building the entrepreneurial experience of students. The use of internships will also provide the industry with an opportunity to provide mentorship and coaching on major operational areas of the business. The next section justifies applying for industry support in this study.

3.4.4.1 Justification for applying for industry support in the study

The importance of industry support is evidenced by the amount of attention it has received from various researchers over the years (Scheyvens, Banks and Hughes, 2016; Pedersen, 2018; Buhmann, Jonsson and Fisker, 2019). Its attention is based on its contribution towards economic development activities, for example, support of student self-employment. The industry is in a position to support student self-employment due to its capabilities. Industry capabilities are highlighted as superior expertise, technology, financial resources, manpower and experience (Hajer, Nilsson, Raworth, Bakker, Berkhout and De Boer, 2015; Frey and Sabbatino, 2018; Marx, 2019). The industry is known to have exceptional expertise to direct entrepreneurial operations. Buhman et al. (2019) argued that the industry benefits society through its expertise. As part of society, students in self-employment can tap from their expertise within the industry. Such expertise can influence student self-employment operations in the areas of marketing and finance. Scheyvens et al. (2016) stated that the industry has the superior technology needed to support entrepreneurial activities. The technology within the industry influences its processes and systems. Through its support, the industry can influence the processes and systems for student self-employment. Consequently, the improvement of processes and systems results in the attainment of competitive advantage within student self-employment. Buhmann et al. (2019) also noted that the industry has a good financial resource base which can be used to benefit society. The industry is, therefore, in a position to provide financial assistance to self-employed students. Financial resources are required to sponsor operations of student self-employment. Without financial resources, student self-employment would not be a success in a competitive environment. The industry also has manpower that can be used to benefit student self-employment. According to Scheyvens et al. (2016), the industry has manpower with exceptional experience. Using its manpower, the industry may provide entrepreneurial mentorship and coaching

to self-employed students. The industry manpower may also share its experiences with self-employed students so that they understand entrepreneurial processes and systems. As already indicated, internships should be used to facilitate the link between students and the industry. It is based on the aforementioned capabilities that industry support is essential for the success of student self-employment. The next section presents a typology of industry support.

3.4.4.2 Measures of industry support

The industry needs to support the operations of student self-employment in a significant manner. Therefore, areas of operational influence must be identified and fully supported. The industry should, therefore, concentrate its support on operational areas such as marketing, finance and general operations of student self-employment (Mitchelmore and Rowley, 2013; Park et al., 2020; Ranabahu et al., 2020). The industry's area of focus in support of student self-employment is presented next.

3.4.4.2.1 Marketing planning training

Student self-employment can get ahead with an effective marketing plan and strategy. Ranabahu et al. (2020) argued that a marketing plan is essential for the success of entrepreneurial ventures. The industry should, therefore, train self-employed students on critical aspects of marketing. Wijaya and Nuringsih (2021) expressed that students should be taught how to handle their products and services. As part of handling products and services, self-employed students should understand that they should always have the required stock in the right quantity and quality. Also, another important area of focus includes pricing (Park et al., 2020). It is the responsibility of the industry to train self-employed students how to effectively price their products and services. Training on the different types of pricing is required so that students are in a position to use competitive pricing strategies. The industry also needs to provide training on promotion strategies (Nguyen et al., 2018). Training on promotion may include aspects such as personal selling, advertising, sales promotion, publicity and digital marketing. The industry should link promotional strategies with the business operations of student self-employment. Product and service distribution is also another area of importance that students should be taught within the marketing programme (Ranabahu et al., 2020).

3.4.4.2.2 Financial planning training

Financial planning is also a critical area of importance that should be considered by the industry in support of student self-employment. Bertoni et al. (2018) affirmed that providing financial strategies to self-employed students is fundamental towards their growth. Thus, the industry needs to coach self-employed students on bookkeeping, cash flow, return on investment, revenue and expenses. According to Hutton and Lee (2012), student self-employment should be aware of procedures that are

taken when bookkeeping is taking place. It is, therefore, the responsibility of the industry to use its expertise to train students on how to carry out bookkeeping. Also, the general cash flow of the business should be considered important in sustaining operations. Mina et al. (2013) outlined that a business, for example student self-employment, requires a healthy cash flow. Apart from cash flow, another area of interest includes return on investment. Paying attention to return on investment is important for pursuing profitable business ventures. Thus, attention to return on investment will also help students to understand other aspects such as revenue and expenses that are equally important.

3.4.4.2.3 Operations planning training

The industry is known to have built a reputation for operational excellence over the years. Using this formidable reputation, the industry should support operations of student self-employment. Ramalu et al. (2020) outlined that the industry is responsible for economic development through the support of operational activities of SMEs, for example student self-employment. Consequently, the industry needs to support student self-employment by coaching them on the skills required for their businesses. The industry also needs to mentor student self-employment on how to handle processes, systems and general operations of the business. Burdett and Barker (2017) agreed that the industry needs to be involved in the development of student entrepreneurial operational skills. Botha and Bignotti (2016) and Ntiamoah et al. (2016) reiterated the importance of operations in the success of SMEs. It is for this reason that the industry should contribute to ensuring that self-employed students obtain support towards their entrepreneurial activities. The next section presents government support.

3.4.5 Government support

To understand the meaning of government support, the explanation must emanate from what comprises the government. In the South African context, the government is comprised of the national government, provincial government and local government (South African Government, 2023). The triple helix model positions the government as an important contributor to economic prosperity. Consequently, government support is theoretically grounded in the triple helix model theory (see section 3.3.1). According to Feola et al. (2019), the government is responsible for the formulation of rules and regulations that are meant to support entrepreneurial activities within the country. In the case of South Africa, the government developed regulations in the form of acts of parliament, for example, the Business Act 71 of 1991, the National Youth Commission Act 19 of 1996, the National Small Business Act 102 of 1996, the Skills Development Act 97 of 1998, and the National Youth Development Agency Act of 2008 (Laubscher, 2018). These acts of parliament also encourage and stimulate the development of student self-employment. Fini et al. (2011) concurred that the

government at various levels should adopt a set of rules to promote and support innovative SMEs, for example, student self-employment. Apart from setting the rules of entrepreneurial engagement within the country, it is responsible for providing financial incentives to boost entrepreneurial ventures of student self-employment. In South Africa, the government has set institutions to support financial requirements for SMEs. Some of these institutions include the Small Enterprise Finance Agency, National Empowerment Fund, the National Youth Development Agency, and the Khula Enterprise Finance (South Africa, Department of Agriculture, Forestry and Fisheries, 2018; Dalibozhko and Krakovetskaya, 2018; Meyburgh, 2022). Fini, Mathisen, Rasmussen and Wright (2017) affirmed that government is responsible for providing financial incentives to encourage entrepreneurship among students. Another responsibility of the government includes the establishment of incubators and science parks as mechanisms to support entrepreneurship. Such establishments are important for exposing student entrepreneurs to entrepreneurial practical experience. It is also the responsibility of the government to support universities and the industry in their student entrepreneurial programmes (Gachie, 2020). The government is, therefore, responsible for establishing a conducive entrepreneurial environment needed for student self-employment to thrive. The next subsection presents a justification for the inclusion of government support in the study.

3.4.5.1 Justification for the inclusion of government support

The inclusion of government support in this study is quite significant since it contributes to a robust ecosystem for student self-employment. It should be noted that a student self-employment ecosystem driven by the triple helix model requires the presence of government support (Gachie, 2020). As already indicated, the government is responsible for setting rules and regulations required to promote student self-employment. The inclusion of government support, therefore, provides a balanced student self-employment ecosystem that is controlled by regulations. Government support, therefore, provides a conducive environment for student self-employment to thrive. This study also includes government support due to its financial contribution towards student self-employment. The previous section indicates the effort that is being invested by the government in support of student self-employment through the establishment of different financial institutions. It is based on this investment that government support is included in the current study. From a theoretical point of view, government support is included due to its theoretical grounding in the triple helix model. With such a strong theoretical grounding, government support contributes to a robust student self-employment ecosystem. Government support has been applied in numerous previous studies that tested the impact of the triple helix model towards student entrepreneurship (Ahmad and Xavier, 2012; Paul and Devonish, 2016; Wu, 2017; Peng and Walid, 2022). The inclusion of government support in previously

published studies shows its importance in the promotion of student self-employment. The next subsection presents the indicators for government support.

3.4.5.2 Measures of government support

Government support towards student self-employment is indicated through government policies and programmes (Ahmad and Xavier, 2012). As already indicated, the government is responsible for developing policies and programmes that are aimed at developing and growing student self-employment. The previous section has also shown that the acts of parliament are developed by the government to promote policies and programmes for student self-employment. This section aims at explaining the indicators of government policies and programmes.

3.4.5.2.1 Government policies

Government policies refer to the rules and regulations that are set by the government to support student self-employment. The structure of government policies should be supportive towards student self-employment. Jena (2020) supported that government policies should focus on promoting SMEs, including those that are newly established. Thus, new businesses, including self-employed students, should be prioritised by the government. This endeavour can only be a reality if it is stipulated in the policy framework. Self-employed students are most likely to face barriers to operation due to difficulty in obtaining operating permits (Peng and Walid, 2022). The government needs to communicate clearly what is required to obtain the required operating permits. The government should formulate a tax system that is supportive of SMEs (Gachie, 2020). This tax system should exempt SMEs, including self-employed students, from paying taxes due to the limited size of their operations. The application of government regulations needs to be consistent. This will help to avoid the creation of confusion regarding what is expected of them to maintain compliance.

3.4.5.2.2 Government programmes

Government programmes refer to the various initiatives that are put in place by the government to support student self-employment. The availability of these government programmes is fundamental towards the success of student self-employment. According to Ahmad and Xavier (2012), it should be easy to identify the government agencies that are responsible for disseminating services required by self-employed students. Self-employed students must be made aware of how to access agencies that provide entrepreneurial support to SMEs. Government programmes should include business incubators to provide students with the practical experience of entrepreneurship. Feola et al. (2019) reiterated that the inclusion of business incubators is critical in building entrepreneurial experience among students. Also, government programmes must be sufficient to cater for the requirements of

self-employed students. Consequently, the programmes need to provide financial and non-financial support to student self-employment. The competence of government officials is also important in ensuring the effective and efficient distribution of government services. Lyver and Lu (2018) argued that government officials play a role in ensuring that entrepreneurial services are adequately delivered.

3.4.6 Social support

Social support is theoretically grounded in the social capital theory as stipulated in section 3.3.4 in this chapter. The concept of social support has attracted wide attention from student entrepreneurship studies across the world (Levesque, 2014; Sahban et al., 2016; Nowinski and Haddoud, 2019; Neneh, 2022). Sarason, Sarason, Shearin and Pierce (1987) defined social support as the intensity of interaction of a person with family and friends to whom they feel attached. Wortman and Dunkel-Schetter (1987) refer to social support as the assistance and protection that a person receives from others. Sahban et al. (2014) described a person's perceived beliefs and expectations about the guidance, advice and assistance that they obtain from the social grouping. In their definition of social support, Sarason et al. (1987) referred to social support through the intensity of interaction. The intensity of interaction explains the strength of the relationship that an individual has with others. Such strength determines the extent to which they can be supported by others. Also, Sarason et al. (1987) mentioned family and friends in their definition of social support. This entails that an individual's social circle lies with their family and friends. This indication shows the importance of the presence of one's family and friends. However, Sarason et al. (1987)'s definition is only limited to family and friends when there are other members of the society, for example, neighbours who could fit in the definition of social support. Closely related to the definition of Sarason et al. (1987) is the explanation given by Wortman and Dunkel-Schetter (1987) and Sahban et al. (2014) in their definition of social support. While Wortman and Dunkel-Schetter (1987) referred to the support structure as *others*, Sahban et al. (2014) elucidated it as a *social grouping*. However, Wortman and Dunkel-Schetter (1987) and Sahban et al. (2014)'s referred to the social structure as *others* and social grouping as a weakness. Their weakness lies in the inability to articulate who is referred to in the social structure (i.e., others and social grouping). It is, therefore, not clear whether others and social groups, indicated by Wortman and Dunkel-Schetter (1987) and Sahban et al. (2014), refer to family, friends, or the general society. This leaves confusion regarding the avenue of social support that one has to focus on when it is not clearly defined in the definition of who forms part of the social structure. Sarason et al. (1987) also described social support in terms of a feeling of attachment. This is an indication that one prefers to obtain social support from those they feels attached to. Wortman and Dunkel-Schetter (1987)'s definition of social support is similar to that of Sahban et al. (2014) regarding its focus on

assistance that one is bound to receive from others. To illustrate this similarity, Sahban et al. (2014) stipulated that social support is seen when one receives guidance, advice, and support. Based on the aforementioned definitions, this study defines social support as the guidance, advice, assistance and support that a student receives from family, friends and society to thrive in their self-employment venture.

3.4.6.1 Justification for the inclusion of social support

Social support is included in the current study due to its contribution to a successful student self-employment ecosystem. The contribution of social support emanates from its benefits. Scholarly work has provided evidence of the importance of social support by linking it to the provision of financial resources, emotional support, labour and information (Matzek, Gudmunson and Danes, 2010; Levesque, 2014; Welsh, Kim, Memili and Kaciak, 2014; Sahban et al., 2016). Financial resources are a requirement for successful student self-employment. Thus, financial resources are needed to sponsor operations for student self-employment. According to Levesque (2014), social support is important because it contributes to the provision of financial resources. Social support is also linked to emotional support which is an important input in successful student self-employment. Welsh et al. (2014) posited that social support is associated with emotional support, which is required in the motivation of student self-employment. Also important is the contribution of social support towards labour required by self-employed students. Matzek et al. (2010) concurred that family and friends can contribute to the labour required by self-employed students. In some instances, such labour is provided for free. Labour is an important resource in the facilitation of effective and efficient student self-employment operations. Another important resource provided through social support is information. Self-employed students obtain valuable information from family, friends, and society. Information is required for ensuring that informed decisions are made. Levesque (2014) admitted that family and friends contribute to the provision of information required by self-employed students. Social support is required for the creation of a supportive environment for entrepreneurship. The creation of a supportive environment leads to an increase in the performance and success of student self-employment. Apart from a practical contribution, social support has been widely applied in numerous student entrepreneurship research (Powell and Eddleston, 2017; Seyoum et al., 2021; Neneh, 2022). This is an indication of the theoretical robustness of social support. Also, social support is theoretically backed by the social capital theory. From both a practical and theoretical point of view, social support was an important construct to include in the current study.

3.4.6.2 Measures of social support

Through their seminal work, different researchers have contributed to providing an understanding of the types of social support (Kahn and Antonucci, 1980; House, 1981; Langford, Bowsher, Maloney and Lillis, 1997). Types of social support include emotional, instrumental, informational and appraisal support. This study only focused on instrumental, informational, and emotional support due to their relevance to student self-employment. Instrumental support is explained in the next subsection.

3.4.6.2.1 Instrumental support

Instrumental support refers to a form of assistance that is tangible. House (1981) described instrumental support to be a type of assistance provided by family, friends, and society in the form of tangible goods and services. It is, therefore, argued that instrumental support should be tangible. In the context of student self-employment, tangible support can be in the form of financial assistance. Tilden and Weinert (1987) also indicated that instrumental support can be shown through assistance to carry out the day-to-day responsibilities of the student who is self-employed. This form of support differs from emotional support that is by nature intangible.

3.4.6.2.2 Informational support

Informational support refers to the facts, data and knowledge provided to people to inform their decisions. Krause (1986) defined informational support as the information that is given to someone during a time of stress. In the context of this study, information is required by self-employed students to make decisions regarding their entrepreneurial ventures. Thus, students require information to make decisions in line with operational requirements, for example, marketing, finance, and human resources. Self-employed students require information to solve problems that may be encountered in the entrepreneurial operational processes (Kozlinska, Rebmann and Mets, 2020).

3.4.6.2.3 Emotional support

Emotional support involves the provision of care, empathy, love, and trust towards an individual. House (1981) highlighted that emotional support conveys a feeling of support that is required to boost one's confidence towards an entrepreneurial venture. In the context of this study, emotional support is represented by having someone to talk to about business. Krause (1986) indicated that emotional support is signified by the availability of someone that can be trusted. It should also be noted that self-employed students need to have people who value them. Emotional support is, therefore, required for stimulating the competitiveness of self-employed students.

3.5 Previous empirical studies on university initiatives, student self-employment, entrepreneurial competence, industry support, government support and social support

This section seeks to analyse literature on university initiatives, student self-employment, entrepreneurial competence, industry support, government support and social support. There is evidence pointing to the abundance of studies that have investigated the relationship between university initiatives and student self-employment (Kraaijenbrink et al., 2010; Saeed et al., 2015; Ranabahu et al., 2020). These studies have shown that university initiatives are fundamental in encouraging student self-employment. The body of knowledge also shows that there are existing entrepreneurial studies that have investigated the mediating effect of entrepreneurial competence (Minai et al., 2018; Khan et al., 2020). However, studies that have investigated the mediation effect of entrepreneurial competence on the relationship between university initiatives and student self-employment are limited. Extant literature also shows that there are entrepreneurial studies that have presented industry support as a mediator (Hamdan et al., 2019; Peng and Walid, 2022). Despite the existence of such a study, the literature shows no evidence of studies that have investigated the mediation effect of industry support on the relationship between university initiatives and student self-employment. Also, government support plays a significant role in student entrepreneurship studies (Oyebanji et al., 2013; Feola et al., 2019; Su et al., 2021). There is also a scarcity of studies that investigated the mediation effect of government support on the relationship between university initiatives and student self-employment. Previous studies, for example, Son et al. (2018) and Neneh (2022) have shown evidence of the moderating effect of social support in different student entrepreneurship studies. However, no study to date has shown the moderation effect of social support on the relationship between university initiatives and student self-employment. A detailed evaluation of previous empirical studies in line with the current research is provided in the next subsections.

3.5.1 Empirical studies on the effect of university initiatives on student self-employment

As already highlighted, numerous previous studies such as Kraaijenbrink et al. (2010), Zhang et al. (2014), Saeed et al. (2015) and Liu et al. (2022) have shown that university initiatives are critical in stimulating student entrepreneurship. In their study, Liu et al. (2022) found that university initiatives such as the creation of entrepreneurship awareness, provision of entrepreneurship ideas and motivation towards new venture creation lead to successful student self-employment. In addition, Liu et al. (2022) found that the use of the university's reputation, provision of financial assistance and offering the campus as a marketplace, encourage student self-employment. Zhang et al. (2014) found

that university initiatives such as teaching students entrepreneurial knowledge, which include opportunity recognition, business plan development and resource acquisition, result in student self-employment. A study carried out by Saeed et al. (2015) found that universities should provide entrepreneurship courses, workshops, and conferences to encourage student self-employment. Saeed et al. (2015) added that universities have to provide students with entrepreneurial experience through projects and internships. Also, Saeed et al. (2015) found that the university's perceived educational support has the highest influence on student entrepreneurial self-efficacy. Perceived educational support is followed by concept development support, business development support and institutional support (Saeed et al., 2015).

The studies carried out by Fitzgerald, Barkanic, Cardenas-Navia, Elzey, Hughes, Kashiri, and Troyan (2014) and Ranabahu, Almeida and Kyriazis (2020) found that universities should provide students with work-integrated learning programmes, for example internships, to stimulate successful student self-employment. Fitzgerald et al. (2014) further highlighted that university initiatives in the form of internships are important in reinforcing entrepreneurial subject content, real-world relevance and application. Galeano, Morales-Menendez and Cantu (2012) also found that the initiatives of universities' should include organising student internships so that they are in a position to develop innovative products, processes and technology-based start-ups. In support of the aforementioned findings, Ramalu et al. (2010) found that entrepreneurship internship programmes, business incubation programmes and entrepreneurial support environments have a significant effect on successful student self-employment.

In their study, Rajchamaha and Papojanasomboon (2021) found that universities should encourage student self-employment by offering entrepreneurship education to improve hard skills such as financial planning, market analysis, new product development and business planning. Also, Rajchamaha and Papojanasomboon (2021) found that university initiatives are critical in building student soft skills such as confidence, initiative, idea generation, creativity, problem identification and solutions. In their study, Su et al. (2021) found that perceived university support significantly affects a students' spirit towards entrepreneurship. Walter, Parboteeah and Walter (2013) found that university initiatives, which include entrepreneurship education, entrepreneurship support programmes, industry ties and research orientation, are fundamental in promoting student self-employment. Badawi et al. (2019) found that universities are responsible for providing business education so that their technical competencies can be improved. Guerrero, Urbano, Cunningham and Gajon (2018) found that the stimulation of an entrepreneurship environment remains one of the initiatives of universities. Oluseye et al. (2017) also found that entrepreneurship education remains one of the important policies of the university to encourage student self-employment. Jena (2020)

also found that entrepreneurship education influences entrepreneurship performance by enhancing profitability and entrepreneurial spirit. Kassean, Vanevenhoven, Liguori, and Winkel (2015) found that entrepreneurship education increases the success of student self-employment.

However, Nandonde and Malaki (2020) argued that despite the abundance of literature pointing to the importance of university initiatives, little is known regarding the mechanisms through which it affects student self-employment. Some studies have indicated that university initiatives may not have a direct impact on student self-employment (Wegner et al., 2019). Kraaijenbrink et al. (2010) also pointed out that the number of students who have opted for self-employment has remained low, despite the increase in the number of entrepreneurship courses offered at universities. Reyes (2016) reiterated that a student's lower motivation into taking entrepreneurship as a career is attributed to inadequate preparation. Davey et al. (2016) found that the role of the university in stimulating student entrepreneurship is still in dispute. Davey et al. (2016) further added that the question remains as to how universities can effectively contribute to student entrepreneurship. It is upon this conflicting background that the current study sought to understand the effect of university initiatives on student self-employment within South Africa. This study hypothesised that:

H1: *University initiatives have a positive effect on student self-employment in South Africa.*

3.5.2 Empirical studies on the mediation effect of entrepreneurial competence on the relationship between university initiatives and student self-employment

Studies in student entrepreneurship, for example, Buli and Yesuf (2015) and Badawi et al. (2019) found that entrepreneurial competence has an effect towards successful student self-employment. Buli and Yesuf (2015) found that entrepreneurial competence skills such as problem-solving, and critical thinking are important in successful student entrepreneurship. Badawi et al. (2019) found that entrepreneurial competence such as risk-taking, critical thinking, problem-solving, and innovation are fundamental skills in encouraging student self-employment. Luke (2013) found that entrepreneurial competence such as problem-solving, leadership, research and development is essential for successful student self-employment. Ferreras-Garcia, Sales-Zaguirre and Serradell-Lopez (2021) found a strong relationship between systematic and professional competencies and entrepreneurial competencies. Ferreras-Garcia et al. (2021) also found that experience contributes to entrepreneurial competence.

A study carried out by Sanchez (2011) found that entrepreneurial competence contributes to the success of student self-employment. Rathna and Vijaya (2009) and Mitchelmore and Rowley (2010) found that successful student self-employment requires a person to have skills related to running a business. Mitchelmore and Rowley (2010), Bamiatzi, Jones, Mitchelmore and Nikolopoulos (2015) and

Tehseen and Ramayah (2015) found that entrepreneurial competence such as networking, which leads to the creation of a large network, is important for successful student self-employment. Al Mamun et al. (2019) also found that entrepreneurial competence, such as networking, results in the performance of micro-sized firms in Malaysia.

An extensive literature review shows that entrepreneurial competence is fundamental for the success of SMEs within emerging markets (Pulka, Ramli and Mohamad, 2021). Pulka et al. (2021) supported Al Mamun, Nawi and Zainol (2016)'s findings in Malaysia that entrepreneurial competence is linked to firm performance. Aftab, Veneziani, Sarwar and Ishaq (2021) found that entrepreneurial competence positively correlates with business performance. In their study, Mitchelmore and Rowley (2013) and Ibidunni, Olokundun, Oke, and Nwaomonoh (2017) found that entrepreneurial competence is a significant predictor of SMEs performance, sustainability, growth and survival. Gerli, Gubitta and Tognazzo (2011) also found that entrepreneurial competence has a significant effect on SMEs. A study carried out by Kyndt and Baert (2015) and Nadia (2021) found that entrepreneurial competence predicts entrepreneurial behaviour. Pranowo, Sutrisno, Sulastiono and Siregar (2021) found that entrepreneurial competence has an effect towards entrepreneurial motivation and performance.

Apart from the aforementioned studies that tested a direct relationship, the body of knowledge shows evidence of studies that tested the mediation effect of entrepreneurial competence. Aftab et al. (2022) found that entrepreneurial competence has a mediation effect on the relationship between entrepreneurial orientation and performance. Gerli et al. (2011) found that entrepreneurial competence plays a mediation effect on the relationship between financial services and the performance of SMEs. Mohamad and Sidek (2013) also found that entrepreneurial competence has a mediation effect on the relationship between financial services and the growth of SMEs. Luo, Guo, Huang and Yang (2022) found that entrepreneurial competence has a mediation effect on the relationship between entrepreneurial environment and entrepreneurial self-efficacy. Kusmintarti et al. (2016) found that entrepreneurial competence such as risk-taking, problem-solving, high energy levels, self-confidence, degree of commitment, flexibility and tenacity have a mediation effect on the relationship between entrepreneurship education and entrepreneurship intentions. Nowinski and Haddoud (2018) found that entrepreneurial competence, such as searching, planning, marshalling, people skills and finance skills, have a mediation effect on the relationship between entrepreneurial attitude and entrepreneurial skills. Despite the existence of studies that provide evidence of the importance of entrepreneurial competence as a mediator within entrepreneurial studies, there is still a gap in the body of knowledge. This gap in the body of knowledge is about a paucity of studies that have tested the mediation effect of entrepreneurial competence on the relationship between university initiatives and student self-employment. The current study sought to close this gap in the

body of knowledge by proposing a student self-employment ecosystem that includes entrepreneurial competence. This study, therefore, hypothesised that:

H2: *Entrepreneurial competence has a positive mediation effect on the relationship between university initiatives and student self-employment.*

3.5.3 Empirical studies on the mediation effect of industry support on the relationship between university initiatives and student self-employment

There are limited studies that have investigated the relationship between industry support and student self-employment (McKechnie, et al., 2014; Ganguli and Matar, 2016; Awang and Hudin, 2017). A study carried out by Ganguli and Matar (2016) found that industry support in the form of the provision of graduate training leads to successful student entrepreneurship. In their study, McKechnie et al. (2014) found that industry support through giving students an opportunity for work-related learning increases their chances for successful entrepreneurship. Pardo-Garcia and Barac (2020) also found that industry support towards improving student entrepreneurial skills results in the creation of successful businesses. In line with Pardo-Garcia and Barac (2020), Awang and Hudin (2017) also found that the industry's encouragement of students creates a successful entrepreneurship environment. Samo and Huda (2019) found that the industry's support through sharing its expertise, experiences, knowledge and information is important in influencing successful student self-employment. In addition, Samo and Huda (2019) found that industry support contributes towards the creation of start-ups.

This section has shown that few existing studies tested the effect of industry support within entrepreneurship ventures. Despite the existence of the aforementioned studies, there is also no evidence of studies that investigated the mediation effect of industry support. Consequently, this study sought to close this existing gap in the body of knowledge by investigating the mediation effect of industry support on the relationship between university initiatives and student self-employment. This current study conceptualised that industry support is important in a successful student self-employment ecosystem. Hence, it was fundamental to test the mediation effect of industry support. This study, therefore, hypothesised that:

H3: *Industry support mediates the relationship between university initiatives and student self-employment.*

3.5.4 Empirical studies on the mediation effect of government support on the relationship between university initiatives and student self-employment

Extant literature shows evidence of the abundance of studies that link government support to entrepreneurial success (Chandler, 2012; Koski and Pajarinen, 2013; Bertoni et al., 2018; Hamdan et al., 2019; Park et al., 2020). Chandler (2012) found that government support through the institution of credit guarantee programmes, results in the growth of SMEs in Canada. Asdrubali and Signore (2015) also found that guarantee facility programmes result in the growth of SMEs. Koski and Pajarinen (2013) found that government support in the form of subsidised loans and loan guarantees results in a high growth rate in start-ups. However, this government support was found to be highly effective in firms that were already experiencing a high growth rate (Koski and Pajarinen, 2013). Dinh, Malesky, To and Nguyen (2013) also found that government support in the form of subsidised interest rate loans has a significant effect on the performance of the SMEs when it is closely monitored.

In their study, Armstrong, Craig, Jackson, and Thomson (2014) found that government support through guaranteed lending results in the success of SMEs. Nitani and Riding (2015) also found that government support through the Canada Small Business Financing Programme resulted in the growth of SMEs. Astebro and Serrano (2015) found that government support through partnerships with SMEs results in an increase in the performance of entrepreneurial activities. In their study, Brown and Earle (2017) found that government support through the provision of loans results in the growth of SMEs that are credit constrained. Wu (2017) found that government support leads to an increase in the research and development of SMEs. The increase in research and development within SMEs increases their performance. Bertoni et al. (2018) also found that government support through participative loans affects the growth of high-technology SMEs. Bertoni et al. (2018) further alluded that government support through participation loans increases the annual growth of high-technology SMEs by 18 per cent in terms of their sales. Through a sample of 488 SMEs, Marti and Quas (2018) found that government support through a participative loan leads to the operational performance and growth of SMEs. A study carried out by Songling, Ishtiaq, Answar and Ahmed (2018) found that financial and non-financial support from the government results in the creation of a sustainable competitive advantage among SMEs. Ojiaku, Nkamnebe and Nwaizugbo (2018) found that government support influences entrepreneurship success. Hamdan et al. (2019) found that government support has a positive effect towards entrepreneurial activities, resulting in economic growth. Jena (2020) also found that government support leads to entrepreneurial success. Peng and Walid (2022) found that government support mediates the relationship between perceived risk and sustainable entrepreneurship.

The aforementioned studies have shown that government support is crucial to the success of SMEs. These studies imply that government support is also beneficial towards student self-employment. However, some studies have disputed the impact of government support on the success of SMEs (Karhunen and Huovari, 2015; Cowling, 2016; Decramer and Vanormelingen, 2016). Cowling (2016) found that subsidised loans and loan guarantees did not always lead to the growth and performance of SMEs. Decramer and Vanormelingen (2016) argued that government subsidies are not big enough to supersede the cost incurred by SMEs. Cerqua and Pellegrini (2014) and Karhunen and Huovari (2015) found that government support towards SMEs is negligible to impact productivity. Alperovych, Hübner and Lobet (2015) found that government support does not have a significant effect on the innovation of SMEs unless it is combined with support from the private sector. Park et al. (2020) found that although government support assisted Korean SMEs to survive, it did not lead to the achievement of growth in assets and sales. Zhang, Li, Zhou and Zhou (2014) found that government support that was linked to political connections did not lead to the performance of SMEs. This section shows that there is contestation among researchers regarding the effect of government support on entrepreneurship success. However, none of the studies have considered government support as a mechanism through which university initiatives can influence student self-employment. To close this gap in the body of knowledge, this study conceptualised government support as a mediator within the student self-employment ecosystem. This study, therefore, hypothesised that:

H4: *Government support mediates the relationship between university initiatives and student self-employment.*

3.5.5 Empirical studies on the moderating effect of social support on the relationship between university initiatives and student self-employment

In their study, Lee, Wong, Foo and Leung (2011) found that social support obtained through family and friends is vital in encouraging one into starting a business. Imbaya (2012) found that family support is an important institution for a person's entrepreneurial success. A study carried out by Laspita, Breugst, Hablich and Patzelt (2012) found that social support through parents plays a significant role in shaping the entrepreneurial success of a student's self-employment endeavours. The influence of parents towards the entrepreneurial success of a student is attributed to the presence of supporting norms, social capital and financial capital. A study carried out by Greenberg (2014) found that the success of start-ups increases due to social relationships, for example, family ties. In addition, Greenberg (2014) stipulated that having entrepreneurial parents is a significant determinant of one's possibility of entrepreneurial success. To support Greenberg (2014)'s findings, Nicolaou and Shane (2014) argued that the entrepreneurial success of a student due to entrepreneurial parents is explained by genetics.

Levesque (2014) and Welsh et al. (2014) found that social support through the provision of financial, instrumental and emotional support contributes towards the development of entrepreneurship.

In their study, Welsh et al. (2014) also found that social support through family members who provide seed capital is crucial towards the success of an entrepreneurial venture. Welsh et al. (2014), Hsu et al. (2017) and Molino et al. (2018) found that self-employed students need support from family and friends to deal with risk and uncertainty associated with entrepreneurship. Sanditov and Verspagen (2011) and Ayalew and Zeleke (2018) found that social factors can either promote or impede student success in entrepreneurship. Sahban et al. (2016) found that family relationships provide a strong business network that offers professional and non-professional resources to influence a successful start-up venture. Powell and Eddleston (2017) found that family support leads to successful entrepreneurship outcomes such as business performance, strategic planning and entrepreneur satisfaction. Osorio, Settles and Shen (2017) found that family support has a statistically significant influence on the desirability and feasibility of starting a business. Manolova et al. (2019) found that social support through family financial support can influence the success of student self-employment.

In their study, Nanda and Sorensen (2010) and Seyoum et al. (2021) found that the exposure that one gets through entrepreneurial family or friends helps to shape entrepreneurship success. Molino et al. (2018) found that there is a relationship between social support and entrepreneurship intentions. In their study, Farrukh, Khan, Khan, Ravan Ramzani and Soladoye (2017) and Lingappa, Shah and Mathew (2020) found that social support through family and friends has an effect towards student entrepreneurial intentions. Seyoum et al. (2021) found that there is a relationship between social support and entrepreneurial intentions. In addition, Seyoum et al. (2021) established that emotional and instrumental support from friends and family are fundamental in driving student entrepreneurship. Seyoum et al. (2021) also found that social support results in the creation of a competitive advantage for SMEs. Neneh (2022) also found that social support has a positive significant effect on entrepreneurial intentions. Klyver et al. (2018) found that emotional support has an impact during the developmental stage of an entrepreneur, while instrumental support is required in the early stages.

An abundance of studies has shown that social support plays a significant role in entrepreneurial success (Manolova et al., 2019; Seyoum et al., 2021; Neneh, 2022). However, there are also existing studies that show that social support does not always result in successful entrepreneurship (Marques, Ferreira, Gomes and Rodrigues, 2012; Eesley and Wang, 2017; Seyoum, 2021). Marques et al. (2012) found that the involvement of family in a person's entrepreneurial activities hurts entrepreneurial success. Eesley and Wang (2017) found that there is no conclusive evidence that having family or friends who are entrepreneurs results in entrepreneurship success. In support of this criticism, Seyoum

et al. (2021) argued that the influence of social support is neither well understood nor sufficiently investigated. There is also no existing evidence of studies that have investigated the moderation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support. The current study sought to fill this existing gap in the body of knowledge. Therefore, three hypotheses were developed as follows:

H5: *Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence.*

H6: *Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through industry support.*

H7: *Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through government support.*

3.5.6 Empirical studies on the effect of social support on entrepreneurial competence

Previous studies have shown a huge interest in the investigation of the relationship between social support and entrepreneurial competence (Levesque, 2014; Sahban et al., 2016; Son et al., 2018; Nowinski and Haddoud, 2019; Xia et al., 2020). Levesque (2014) found that social support in the form of financial assistance from friends and family result in entrepreneurial competence. In their study, Sahban et al. (2016) found that social support in the form of physical support leads to an improvement in entrepreneurial competence. In their study, Son et al. (2018) also found that emotional support has an effect on entrepreneurial competence. Based on the aforementioned findings of previous studies the following hypotheses were developed:

H8: *Social support has a positive effect on entrepreneurial competence (i.e., instrumental generic competence, interpersonal generic competence and systematic generic competence).*

3.6 Chapter summary

This chapter presented the theoretical framework in line with the current study. Consequently, relevant theories for this study have been identified as the triple helix model, the entrepreneurial action theory, the human capital theory, and the social capital theory. Justification for the application of these theories in this study has been provided. However, to provide a balanced view, criticism for each of the theories was also discussed. This chapter also moved on to evaluate the key constructs of the study. As part of the evaluation, this study provided a justification and specific measures for each of the key constructs of the study. The next chapter evaluates the research methodology that was applied to operationalise the current study.

Chapter 4

RESEARCH METHODOLOGY

4.1 Chapter overview

The preceding chapter focused on evaluating the literature that informs this study. Consequently, the evaluation of the literature in the previous chapter concentrated on presenting the theoretical and conceptual framework of the study. The current chapter discusses the research methodology applied in this study. In line with the purpose of the present chapter, the discussion centres on the research paradigm, methodology and design. This chapter also discusses the data collection methodology applied in the study. The sampling design, data collection instrument, validity and reliability, limitation of the methodology applied and ethical considerations are also discussed in the chapter. A discussion of each technique applied in this study will be accompanied by sufficient justification.

4.2 Introduction

The choice of the research methodology was determined by the empirical research objectives, research questions and the hypotheses formulated for this study. As already indicated in Chapter 1, this study had as its empirical research objectives to evaluate students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa; to measure the effect of university initiatives on student self-employment in South Africa; to measure the effect of social support on entrepreneurial competence; to establish the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment in South Africa; and to investigate the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa. The research questions and hypotheses were also constructed to reflect the research objectives. To measure the empirical research objectives, research questions and research hypotheses in this study, the positivist research paradigm was applied.

4.3 Research paradigm and its justification

A research paradigm is defined as a model or pattern through which research can be carried out (Haigh, Kemp, Bazeley and Haigh, 2019; Bonache and Festing, 2020). Kuhn (1996) also defined a research paradigm as a set of theories and assumptions used by researchers to carry out research. The

research paradigm is also understood in terms of the ontology, epistemology and methodology applied to the research (Guba and Lincoln, 2005). Ontology answers what is reality, epistemology focuses on how it is possible to know reality, and methodology concentrates on how to go about to discover reality (Irfan, Quraishi, Purdie and Wilkinson, 2022). For successful research to take place, the researcher needs to choose an appropriate research paradigm that will enable data to be collected, analysed and interpreted effectively. Thompson and Perry (2004) agreed that the researcher should choose the appropriate research paradigm for the study. This study made use of the positivist research paradigm. The application of the positivist research paradigm was carefully chosen to align the research with the quantitative research methodology (Blumberg et al. 2011).

A constructivist research paradigm was not suitable for this study, despite its recognition of the existence of the subjective world. Burns, Bally, Burles, Holtslander and Peacock (2022) affirmed that the constructivist research paradigm focuses on providing an understanding of a subjective world. This study did not make use of the constructivism research paradigm for two main reasons: It is used for theory building, and the researcher plays the role of a participant (Perry, 1998a; Malhotra, 2010). This study did not aim at developing a theory. Its focus was on testing already existing theories, for example, the triple helix model, the entrepreneurial action theory, the human capital theory and the social capital theory. Hence, it was not necessary to make use of the constructivism research paradigm since it aimed at developing a new theory. Also, it should be noted that the researcher was not a participant in the research process. Consequently, the use of the constructivist research paradigm was considered inappropriate in the current study.

The positivist research paradigm was, therefore, considered as the appropriate research paradigm in the current study. Applying the positivist research paradigm was suitable because it views the world as an objective external entity (Park, Konge and Artino, 2020). The assumption of the positivist research paradigm that the world is an objective entity is consistent with the use of the quantitative research methodology. The positivist research paradigm is suitable when the researcher is interested in obtaining a family of answers for an existing entrepreneurial problem using a set of questions. Consequently, the problem involved a lack of a supportive entrepreneurial environment towards student self-employment. To investigate this problem, this study required the researcher to test the predictive power of university initiatives towards student self-employment. This investigation also required the researcher to account for the mediation role of entrepreneurial competence, industry support and government support while considering social support as a moderator (Healy and Perry, 2000). The positivist research paradigm is also concerned with the objective of answering questions related to people's lives. This study was based on university students' real life in line with self-

employment. Therefore, it was appropriate to make use of the positivist research paradigm (Perry, 1998b).

The positivist research paradigm is also known for its ability to describe and explain a social complex phenomenon (Healy and Perry, 2000). This research also involved a social complex phenomenon due to the inclusion of multilevel stakeholders (i.e., universities, industry, government, and society) in the development of the student self-employment ecosystem. The positivist research paradigm is also suitable for a quantitative research methodology. It should also be noted that the use of the positivist research paradigm is also in line with a study that follows a deductive reasoning to build the study from existing theories. This study followed already established theories - the triple helix model, the entrepreneurial action theory, the human capital theory and social capital theory - in order to answer the research questions. This study applied the quantitative research methodology as explained in the next section.

4.4 Quantitative research methodology and its justification

As already indicated, the positivist research paradigm was applied in this study since it is aligned with the quantitative research methodology (Blumberg et al., 2011). Whelan (2019) argued that the positivist research paradigm allows the researcher to use the quantitative research methodology based on the formulated research questions. This study applied the quantitative research methodology to be consistent with the research objectives, research questions and research hypotheses in this study. The nature of the research objectives in this study was such that they focused on testing the effect of one construct towards another, for example, the effect of university initiatives on student self-employment. To operationalise a research objective of this nature, the researcher needs to use a quantitative research methodology. The use of a quantitative research methodology was appropriate because it permits the collection of structured data. Structured data is required when one needs to test the effect of one construct on the other. The use of the quantitative research methodology also permits the researcher to collect data using a structured questionnaire (Saunders et al., 2019). A structured questionnaire enables one to collect structured data as needed by research objectives that are interested in testing the effect of one construct on another (Chain, Santos, Castro and Prado, 2019:60). The quantitative research methodology requires the use of numbers and statistical methods to carry out the research (Blumberg et al., 2011). Apart from allowing the use of a questionnaire which is a statistical data collection tool, the quantitative research methodology also permits statistical data analysis to be applied. This study required the use of statistical data analysis to achieve the research objectives. Thus, descriptive and inferential data analysis in the form of frequency distribution, mean, standard deviation, SEM, mediation and moderation was required for this study.

Hence, the use of the quantitative research methodology was appropriate to apply. Saunders et al. (2019) argued that quantitative research methodology is applied when the researcher is interested in handling large data. This study required the use of large data to enable the application of inferential data analysis. Complex inferential data analyses such as SEM, mediation and moderation require the data to be large. The use of large data assists in achieving reliability and validity during the evaluation of the measurement model. The use of the quantitative research methodology in this study was also benchmarked to previous similar studies. Ayalew and Zeleke (2018) and Feola et al. (2019) made use of the quantitative research methodology in their studies that were similar to the present one. Consequently, the use of the quantitative research methodology was appropriate in the current study. The next section justifies the use of the descriptive research design in the current study.

4.5 Descriptive research design and its justification

The descriptive research design is appropriate for a study making use of the quantitative research methodology. Taking into consideration that this study made use of the quantitative research methodology, it was appropriate to apply the descriptive research design to this study. Authors such as Atmowardoyo (2018), Saunders et al. (2019) and Siedlecki (2020) also argued that the descriptive research design is suitable for a quantitative research methodology. The use of the descriptive research design is suitable when the researcher is interested in describing an existing research phenomenon (Saunders et al., 2019). This study required the researcher to describe an existing research phenomenon aligned with the effect of university initiatives on student self-employment as well as the mediation role of entrepreneurial competence, industry support and government support. Also, this phenomenon required the description of the moderation role of social support. It should also be noted that the descriptive research design is most appropriate for handling large data. Saunders et al. (2019) supported that the descriptive research design should be applied when the researcher is making use of large data. This study applied large data since it was required for achieving reliability and validity during the evaluation of the measurement model. This study collected large data from a sample of South African university students involved in student self-employment. It should also be noted that the descriptive research design is required when the researcher is interested in carrying out statistical data analysis. Stangor (2011), Saunders et al. (2019) and Nickerson (2022) affirmed that the use of the descriptive research design is consistent with statistical data analysis. This study made use of simple to complex data analysis techniques to achieve the research objectives. The next section justifies the use of the survey method in the current study.

4.6 Survey method and its justification

This study applied a survey because it pursued a quantitative research methodology. Saunders et al. (2019) argued that the use of a survey is appropriate in a quantitative study. A survey method is also suitable when the researcher aims at collecting data to describe an existing phenomenon. Saunders et al. (2019) posited that a descriptive research design is consistent with the survey method. This study aimed at describing a phenomenon related to the development of a student self-employment ecosystem informed by university initiatives, industry support, government support, social support and entrepreneurial competence. Consequently, it was appropriate to make use of the survey method in the current study. The survey method is also applied when the researcher aims at collecting data that is reliable and valid (Hubbard and Armstrong 1994). The reliability and validity of data increase as its size is enlarged. Surveys enable the researcher to collect large data which contributes to the increase in reliability and validity. Using surveys increase the reliability and validity of the study due to the application of previously tried and tested scales (Perry, 1998a; Smith and Yung, 2023). The scales applied in this study, for example, university initiatives, industry support, government support, entrepreneurial competence and social support have been applied in previous studies (Ahmad and Xavier, 2012; Saeed et al., 2015; Gubbins et al., 2020; Ferreras-Garcia et al., 2021).

Making use of the survey ensures that large data with equal representation is collected. Blumberg et al. (2011) alluded to the point that surveys allow the researcher to collect data from large sample sizes to accommodate an equal representation of the study elements. This study also aimed at allowing the representation of students from different gender groups, universities and academic levels. Therefore, the use of the survey method was fundamental. Therefore, survey methods increase the generalisability of the research findings (Mullinix, Leeper, Druckman and Freese, 2015).

The use of a survey is also appropriate when the researcher aims at collecting data within a short period (Singh and Sagar, 2021). Academic research aimed at obtaining a postgraduate qualification is usually given a timeline that may span up to five years. To be able to complete the research within the given limited time, it makes sense for researchers to make use of the cross-sectional survey method to collect data. The cross-sectional survey method enables the researcher to collect data within a limited time-span (Ponto, 2015). Making use of a survey in this study was influenced by the methods that were successfully applied in previous studies. Researchers such as Feola et al. (2019) and Neneh (2022) successfully used a survey method in their studies similar to the present study.

The research objectives, research questions and research hypotheses were also considered in the decision to use the survey method. According to Field (2009) and Blumberg et al. (2011), the nature of research objectives determines the data collection technique to apply. In the case of the current study,

research objectives, research questions and research hypotheses involved the testing of the effect of one construct on another. Consequently, such formulation required that a survey method through a structured questionnaire is applied to achieve the research objectives, research questions and research hypotheses. Surveys are also suitable when the researcher is interested in learning the opinions of a study's respondents. The survey method was also applied because it allows little to no involvement of the researcher. Blumberg et al. (2011) argued that social research takes two approaches that are either observational or communicational. Observational research permits the researcher to observe the conditions and behaviour of participants (Healy and Perry, 2000). The communicational approach requires the respondents to communicate their feelings and thoughts about the phenomenon under study, with little or no involvement of the researcher. Therefore, this study made use of the survey method due to its connection with the communicational approach. Figure 4.1 provides further justification for the survey method as the data collection method in this study.

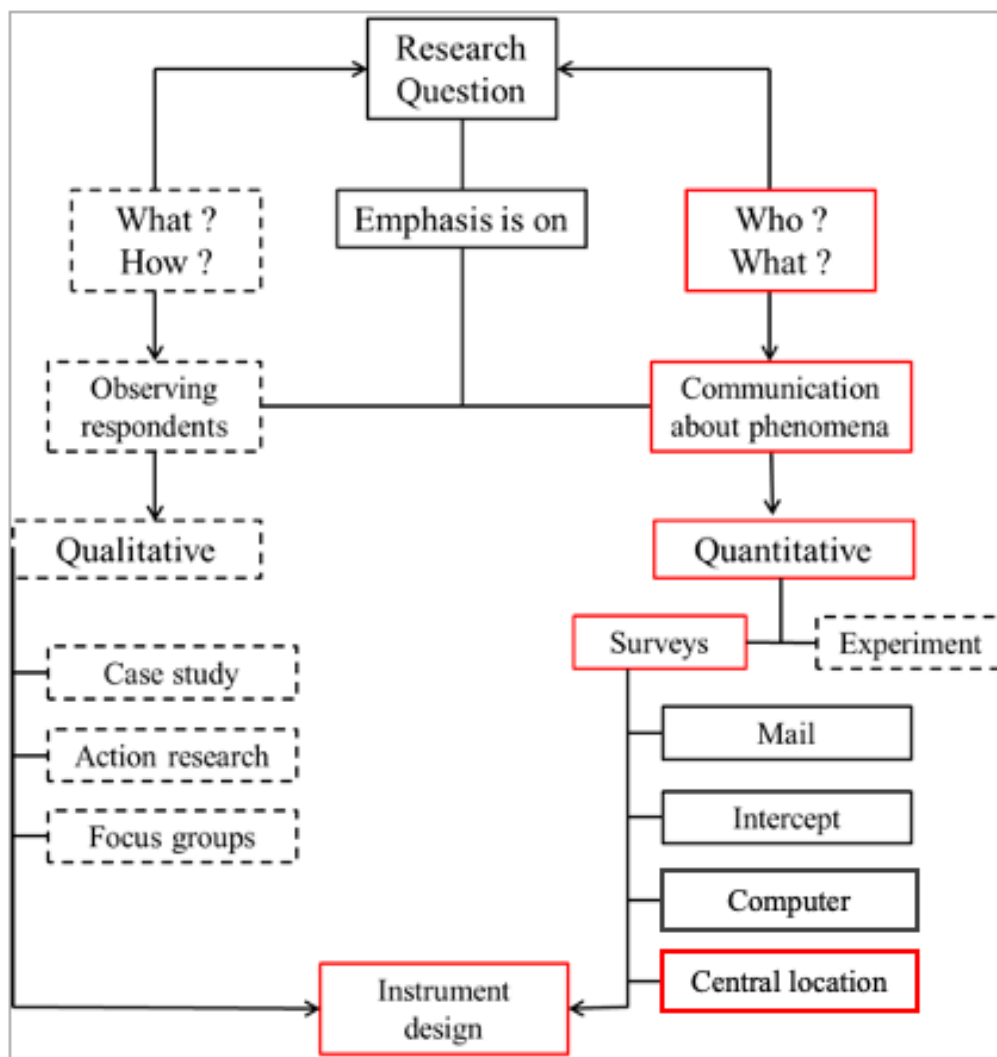


Figure 4.1 Justification of research approach and data collection

Source: Perry (1998a) and Blumberg et al. (2011)

The determination of the data collection technique is further determined by the type of questions asked in the research. This study had questions formulated, beginning with the words *who* and *what*, for example, one of the questions was phrased as: What is the effect of university initiatives on student self-employment? This study was also concerned with communicating the research phenomenon. The nature of the aforementioned question provides direction that this study was quantitative. Therefore, it warranted the use of a survey technique to carry out the study through a centralised location at the EDHE events (Calder et al., 1981; Healy and Perry 2000). The next section presents the sampling design and techniques.

4.7 Sampling design and techniques

The consideration of the sampling design is an important component in ensuring that an acceptable sample for the study is achieved. It is, therefore, important that the researcher considers the criteria for achieving the right sample design (Malhotra, 2010; Blumberg et al., 2011). In the determination of the sampling design, this study considered at least seven factors: population of interest, parameters of interest, sampling frame and sampling technique, minimum sample size, budget and execution of the sampling design. These factors are further explained in the next subsections.

4.7.1 Population of interest

The population of interest comprised of university students in South Africa who were self-employed and participated in the EDHE programme. These students should have participated in the EDHE programme to understand university initiatives, industry support and government support towards student self-employment. A further definition of population of interest was provided in terms of elements, sampling units, extent and the time of data collection (Malhotra 2010; Smit and Yung, 2023). These factors are described in Table 4.1.

Table 4.1 Population definition

Population criterion	Explanation
Element	University students in South Africa who were self-employed and have participated in the EDHE programme.
Sampling unit	Self-employed university students participating in the EDHE programme at the time of data collection.
Extent	Self-employed students who have participated in the EDHE programme can understand university initiatives, industry support and government support towards student self-employment during the time of data collection.
Time	Data was collected in September 2023.

Source: Adapted from Malhotra (2010:372)

In line with the population of interest indicated in this study, a convenience sample of self-employed university students in South Africa, who were participating in the EDHE programme, took part in this study (Calder et al., 1981; Andrade, 2021). A criteria through which students were selected was put in place before data collection commenced. This criterion is expressed as follows:

4.7.1.1 The problem (rise in university graduate unemployment in South Africa)

The problem in this study was identified as the increase in university graduate unemployment in South Africa. This increase in university graduate unemployment questioned the support provided by universities, industry and government towards student self-employment. Consequently, an investigation was required to understand the effect of universities, industry, government, social support and entrepreneurial competence towards building a successful student self-employment ecosystem. Since students were naturally a centre for this investigation, it made sense to regard self-employed university university as the appropriate sample for this study (Ayalew and Zeleke, 2018; Alrifa and Raju, 2019).

4.7.1.2 Accessibility and cost consideration

The accessibility and cost involved in carrying out the study were critical in the consideration of the sampling design. The researcher needed to consider an element and a sampling unit that is accessible. While self-employed students understood the research phenomenon, they were also accessible through the EDHE events. Thus, the Annual EDHE Lekgotla and Studentpreneurs Indaba that took place between 4 and 8 September 2023 provided access to self-employed university students in South Africa. Also, the cost implications were important to consider in the selection of the sampling design. Collecting data from self-employed students participating in the EDHE events was found to be cost-effective. It is based on the aforementioned reasons that self-employed university students in South Africa were considered as the appropriate sample for the current study.

4.7.1.3 Application of a previously used sample design

This study ensured that its sampling design is benchmarked to previous similar studies. Studies such as Bae et al. (2014), Bergmann et al. (2016) and Badawi et al. (2019) applied a sample design comprised of university students. It was, therefore, appropriate for the current study to consider the sample applied in previous studies. University students in entrepreneurship have an understanding of university initiatives, industry support, government support, social support and entrepreneurial competence. Hence, self-employed university students were considered as the appropriate sample for this study.

4.7.1.4 Experience of the study respondents

The experience of the study respondents was considered in this study. Self-employed university students who had participated in the EDHE programme had the required experience to understand the study phenomenon. Thus, due to their participation in the EDHE programme, university students had an understanding of the effect of university initiatives, industry support, government support, social support and entrepreneurial competence. Such understanding was important for self-employed university students to be able to participate effectively in the current study. Also, these university students were considered a homogenous group due to the aforementioned common understanding.

4.7.2 Parameters of interest

Understanding the parameters of interest is fundamental when the researcher seeks to determine the most appropriate research design. Thus, the parameter of interest was important to the researcher since it guides four aspects, namely the nature of data to be collected, sample size, type of sample and data analysis. An explanation of these aspects is provided in the subsequent sections of the chapter. Also, important to consider is the nature of research objectives. The research objectives in this study were four-fold, thus to evaluate students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa; to measure the effect of university initiatives on student self-employment in South Africa; to establish the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment in South Africa; and to investigate the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa. These research objectives show that the parameters of interest were classified into four types of constructs. These constructs were predictor (university initiatives), outcome (student self-employment), mediators (entrepreneurial competence, industry support and government support) and moderator (social support). All the constructs were measured using a continuous scale (*Strongly Disagree* = 1; *Disagree* = 2; *Neutral* = 3; *Agree* = 4; *Strongly Agree* = 5). These parameters of interest are illustrated in Table 4.2.

All the constructs listed in Table 4.2 were required to facilitate the first empirical objective. The first empirical objective sought to evaluate student perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa. The second empirical research objective required the presence of universities as a predictor and student self-employment as an outcome. The third empirical objective needed the researcher to include entrepreneurial competence, industry support and government

support as mediators. The fourth empirical research objective involved the inclusion of social support as a moderator. These research objectives were analysed using descriptive (i.e., mean and standard deviation) and inferential statistical analyses (i.e., SEM, mediation and moderation) through SmartPLS 4 to keep with the replication logic (Field 2009; Diamantopoulos and Schlegelmich 2000).

Table 4.2 Parameters of interest

Variable	Type of variable	Measurement	Number of items
Age	Biographic	Continuous	1
Gender	Biographic	Categorical	1
Education	Biographic	Continuous	1
Area of study	Biographic	Categorical	1
University initiatives	Independent	Continuous	6
Entrepreneurial competence	Mediator	Continuous	12
Industry support	Mediator	Continuous	4
Government support	Mediator	Continuous	5
Social support	Moderator	Continuous	5
Student self-employment	Dependent	Continuous	5
Total variables			41

Source: Kraaijenbrink et al. (2010), Ahmad and Xavier (2012), Saeed et al. (2015), Gubbins et al. (2020) and Nandonde and Malaki (2020)

The justification of the statistical analysis methods in this study is provided as follows:

4.7.2.1 To keep up with replication logic

To keep up with replication logic, this study applied statistical analytical methods that were used in a previous similar research. In their studies, Hamdan et al. (2019) and Cox et al. (2020) made use of SEM, mediation, and moderation analyses to achieve research objectives similar to the ones in the current study. It was appropriate for the current study to follow the statistical analysis methods that were successfully applied in previous studies.

4.7.2.2 To achieve robustness, reliability, and validity

It was important for this study to ensure that its robustness, reliability, and validity are maintained. This was to ensure that findings from the study are trustworthy and useful in developing a successful student self-employment ecosystem. Consequently, the current study made use of SmartPLS 4 to evaluate the measurement model for its reliability and validity. Also, SEM is recommended for the creation of robust models (Hair et al., 2018; Latan, 2018).

4.7.2.3 Obtaining simple results

The results obtained in the research must be simple. This helps to ensure that the interpretation is carried out in a meaningful way. The use of mean, standard deviation, SEM, mediation, and

moderation did not create interpretation problems for the researcher. The researcher was, therefore, able to interpret the findings of the study in a meaningful manner (Pallant 2010).

4.7.2.4 Need to test student perceptions of the research phenomenon

The use of mean and standard deviation is recommended when the researcher seeks to understand the perceptions of the research elements. In the case of the current study, the researcher sought to understand student perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa. Hence, it was appropriate to make use of descriptive analysis in the form of mean and standard deviation (Andrade, 2020).

4.7.2.5 Need to test the effect of one construct on another

Testing the effect of one construct on another was one of the empirical research objectives. It is recommended that researchers use SEM to test the effect of one construct on another (Hair et al., 2019). Therefore, this study made use of SEM to measure the effect of university initiatives on student self-employment (Shmueli, Ray, Velasquez Estrada and Shatla, 2016).

4.7.2.6 Need to test the mediation effect of constructs on the relationship between two constructs

It was also one of the research objectives of this study to understand the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment. Based on this requirement, the current study made use of mediation analysis (Nitzl, Roldán and Cepeda, 2016; Svensson, Ferro, Høgevold, Padin, Sosa Varela and Sarstedt, 2018).

4.7.2.7 Need to test the moderation effect of one construct on existing relationships

As already indicated, this study sought to test the moderation effect of one construct on existing relationships. Richter, Hauff, Ringle and Gudergan (2022) pointed out that moderation analysis should be carried out to determine if a construct leads to the strength or direction of the relationship between two or more constructs. The current study, therefore, tested the moderation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support.

The interaction among the constructs of this study is indicated in Figure 4.2. This figure presents the justification of the research methodology and parameters of interest. Thus, a distinction has been made regarding the predictor, outcome, mediator, and moderation constructs. The measurement of

these constructs has been indicated in the form of a continuous scale (Sarstedt, Hair, Ringle, Thiele and Gudergan, 2016a).

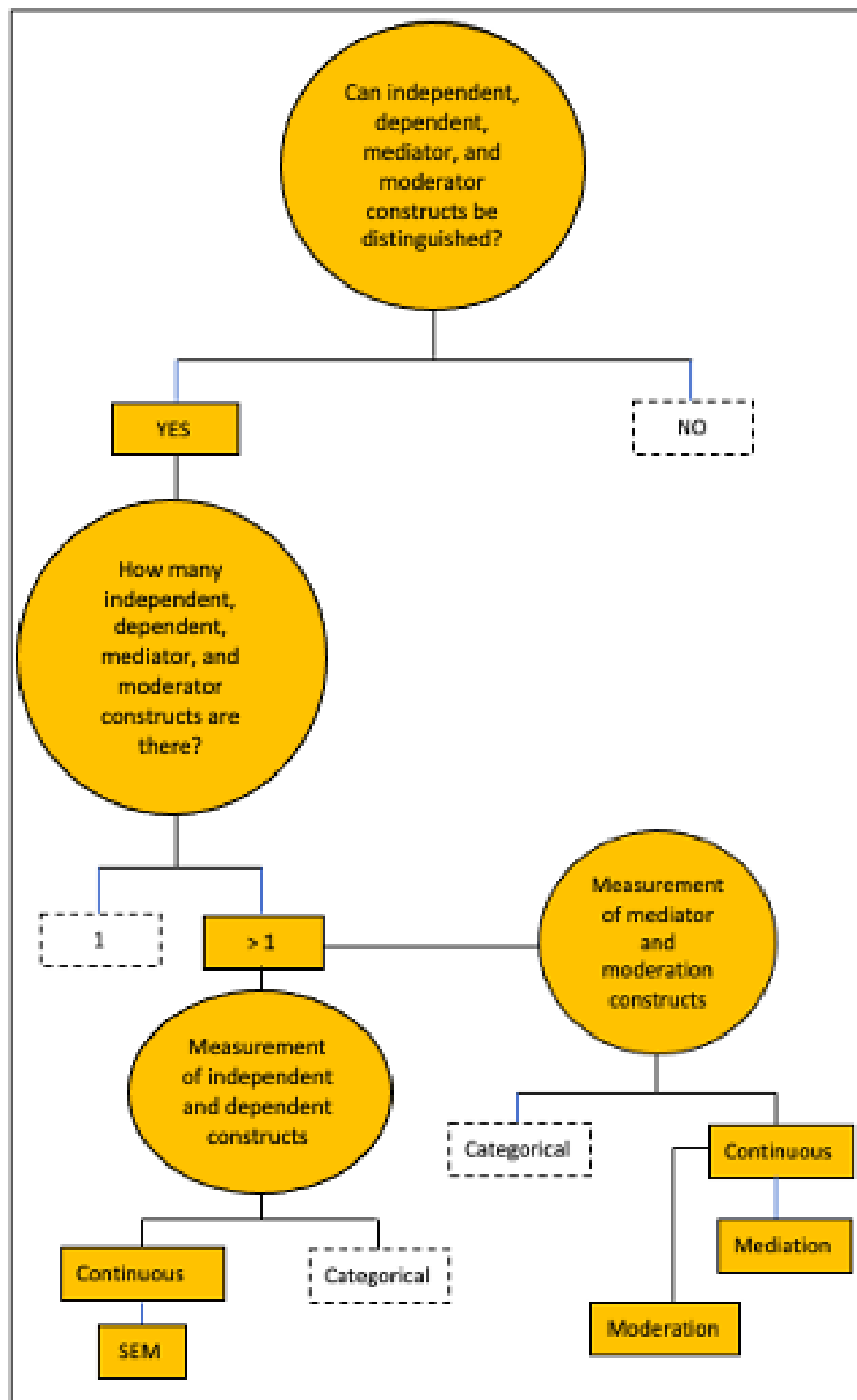


Figure 4.2 *Justification of research approach*

Source: Diamantopoulos and Schleiermacher (2000) and Field (2009)

In line with the research objectives and the parameters, the relevant statistical analytical methods implemented in this study are provided. Detailed information regarding the statistical analyses applied in this study will be provided in the subsequent sections of this study. The next section justifies the selection of the survey population, sampling frame and sampling technique.

4.7.3 Selection of survey population, sampling frame and sampling technique

This study chose South Africa as a survey nation for a couple of reasons. These reasons are as follows: South Africa has established policies and regulations through acts of parliament in line with the promotion of SMEs; evidence of student self-employment in South Africa; and rise of graduate unemployment in South Africa. These acts of parliament include the Business Act 71 of 1991, the National Youth Commission Act 19 of 1996, the National Small Business Act 102 of 1996, the Skills Development Act 97 of 1998, and the National Youth Development Agency Act of (Laubscher, 2018). It should be noted that these acts are also in place to benefit and promote student self-employment. However, the effective implementation of these acts in line with student self-employment is questionable. It is based on this aforementioned reason that South Africa was selected as a survey nation. There is also evidence of student self-employment in South Africa. This is evidenced by the EDHE programme that aims at promoting student self-employment. However, the effectiveness of student self-employment in South Africa is contentious. It is for this reason that the current study was carried out in South Africa. There is also a sharp rise in graduate unemployment in South Africa. Stats SA (2023) recorded a 10.6 per cent in graduate unemployment in the first quarter of 2023. This is a concerning matter in South Africa. South Africa requires an effective student self-employment ecosystem based on the collaboration of a multi-tiered network that involves universities, industry, government, society and student entrepreneurial competence. Hence, it was important to select South Africa as the survey nation.

In line with the survey nation, the survey population was self-employed South African university students participating in the EDHE programme. Opinions of self-employed university students in South Africa were required in developing a successful comprehensive multi-tiered student self-employment ecosystem. Self-employed university students in South Africa were the right survey population since they are the expected recipients of university initiatives, industry support, government support and social support in a successful student self-employment ecosystem. Consequently, self-employed university students are in a position to answer questions related to the research phenomenon.

Considering that self-employed university students in South Africa who participated in the EDHE programme were the target population, the use of the convenience sampling technique was suitable. The convenience sampling technique was suitable because the target population was comprised of

self-employed university students in South Africa facing homogenous conditions exposed to them by the EDHE programme. Consequently, it was time and cost-effective for the researcher to make use of the convenience sampling technique considering that self-employed university students in South Africa participating in the EDHE programme were exposed to similar conditions. Although the non-probability method in the form of the convenience sampling technique is known for having a representativeness problem, in this study it is compensated by applying a large sample size. The next section presents the sample size.

4.7.4 Sample size

Large sample sizes are recommended for quantitative studies for a variety of reasons, namely: reliability, validity, and meaningful analyses. Researchers should consider applying a large sample size to achieve high reliability within the measurement model. Thus, a large sample size enables the measures of reliability, for example, Cronbach's Alpha and composite reliability to be high (Diamantopoulos, Sarstedt, Fuchs, Wilczynski and Kaiser, 2012). In terms of validity, it is also recommended that large sample size is applied. Consequently, a large sample size enables the achievement of validity of the measurement model in the form of convergent validity and discriminant validity (Sarstedt, Diamantopoulos, Salzberger and Baumgartner, 2016b; Cheah, Sarstedt, Ringle, Ramayah and Ting, 2018). Also, meaningful analysis is obtained through a large sample size. Saunders et al. (2019) posited that quantitative researchers should aim at applying a large sample size due to its advantages of achieving meaningful analysis. Thus, meaningful analysis is needed for producing useful results.

Apart from the important considerations of reliability, validity and meaningful analysis, the researcher understood that defining the meaning of a large sample is always problematic. To counteract this problem, the researcher also took into consideration the recommendations provided regarding the definition of large data. Pallant (2010) argued that at least 100 respondents are sufficient for achieving reliability, validity and meaningful inferential data analysis. Field (2009) argued that suitable data in quantitative studies should match an item (question) to a respondent ratio of 1:5 or 1:10. Thus, taking this criterion in consideration, it ensures that when applying the 1:5 ratio, it means for each question included in the study there should be five respondents. The 1:10 ratio means that for each question involved in the study, there should be 10 respondents. This study had 41 items in the questionnaire as stipulated in Table 4.2. Using the 1:5 criteria, the current study required at least 205 respondents (41×5) for reliability, validity and meaningful data analysis to be achieved (Pallant, 2010). However, the sample size for this study was 375, which was quite higher than the minimum required threshold. The next section presents the impact of time in the determination of the research methodology.

4.7.5 Time

Time is an important factor to consider when carrying out research aimed at achieving a postgraduate qualification, for example, a doctorate in the case of the current study. Universities operate with a timeline through which a registered postgraduate student should complete the qualification. At the University of the Free State, where this research was carried out in fulfilment of a doctorate, the researcher was given a maximum period of five years inclusive of all academic requirements, namely proposal formulation, departmental research committee approval, faculty research committee approval, ethics approval, data collection and write-up of the chapters. To ensure that all the academic requirements are achieved within the given time, an appropriate sampling design had to be applied. The use of the convenience sample of self-employed university students in South Africa ensured that the data required in this study was collected timeously. A convenience sample of self-employed students in South Africa could be accessed easily. It was, therefore, possible for the researcher to complete the study within the provided timeframe of five years. The chosen population was also aware of the research phenomenon in this study. This was important for the timeous completion of the questionnaire.

4.7.6 Execution of sampling design

As already highlighted in section 4.7.1, the population of interest comprised self-employed university students who had participated in the EDHE programme. Self-employed university students who had participated in the EDHE programme knew about the research phenomenon. Their knowledge of the research phenomenon was built as a result of their engagement with the EDHE programme. The EDHE programme creates a support platform that ensures that university students who were in entrepreneurship and were self-employed would obtain support from their universities, government and the industry. Consequently, the researcher ensured that only self-employed university students who had participated in the EDHE programme participated. The recruitment of this group of university students to take part in the study was carried out at the EDHE event that took place in September 2023 in Cape Town. A screening question was also applied to ensure that only university students who were participating in the EDHE programme took part in the study. The distribution of the questionnaire was carried out from 4 to 8 September 2023 during the Annual EDHE Lekgotla and Studentpreneurs Indaba carried out at the University of the Western Cape. The research assistants distributed the self-completion questionnaire each morning to participating students during the EDHE events. Collection boxes were circulated in the venue of the event to allow students to deposit their completed questionnaires.

4.8 Data collection instrument and measuring parameters of interest

The data collection instrument applied in this study was a self-completion questionnaire. The questionnaire was developed after a comprehensive literature review (see Chapter 3, section 3.4). A comprehensive review of the literature provided measures for university initiatives, industry support, government support, social support, and entrepreneurial competence (Kraaijenbrink et al., 2010; Ahmad and Xavier, 2012; Saeed et al., 2015; Gubbins et al., 2020; Nandonde and Malaki, 2020). The measures applied were previously employed by researchers whose studies were similar to the current study. A detailed explanation of the measures applied in the data collection instrument is provided next.

4.8.1 Measurement of university initiatives

The measurement of university initiatives was required in the data collection instrument to match the requirement of the research objectives. A questionnaire developed by Kraaijenbrink et al. (2010) and Saeed et al. (2015) were adapted to suit the current study. University initiatives towards self-employed students were measured through educational support, concept development and business development (Wegner et al., 2019; Shi et al., 2020; Su et al., 2021). Educational support was measured through initiatives such as business mentorship and coaching provided to university students. Such business mentorship and coaching are provided to promote student self-employment. Concept development and business development is also another fundamental initiative provided by universities. It was important for this study to investigate if universities were carrying out any initiatives to motivate students to be in business. It was also important to measure if universities assisted students with ideas for new businesses. The inclusion of university initiatives in this study was in line with the need to develop a successful student self-employment ecosystem. Universities are expected to play a significant role in encouraging student self-employment. This is based on the reasoning that universities spend much time with students during the process of teaching and learning. Consequently, universities need to take advantage of this opportunity to promote student self-employment.

4.8.2 Measurement of student self-employment

The measurement of student self-employment is associated with entrepreneurial activities. Literature suggested that student self-employment is measured through the ability of the student to produce a business plan, secure funding and develop good business ideas (Farmer et al., 2011). Also, important to measure was the ability of students to register a company. The researcher also investigated whether self-employed students had enough skills to run their own businesses. It was important for this study

to investigate the ability of students to produce a business plan because it is an important guideline for business operations. A business plan directs an entrepreneur towards fundamental business activities (Mitchelmore and Rowley, 2013). Understanding business activities through efficacy in the development of a business plan is important for successful student self-employment. The ability to secure funds is also important for successful student self-employment. Funds are required to sponsor business activities, for example, the purchase of business inputs. The development of good business ideas is also needed to ensure that the business remains competitive.

4.8.3 Measurement of entrepreneurial competence

The measurement of entrepreneurial competence was carried out through instrumental generic competence, interpersonal generic competence and systematic generic competence (Villa and Poblete, 2007; Kusmintarti et al., 2016). Instrumental generic competencies were measured through decision-making skills, ability to manage time, capacity to find new information and efficacy in interpreting information. Interpersonal generic competencies involved human relations skills, networking skills, interpersonal skills and commitment skills. Systematic generic competencies included skills such as innovativeness, risk-taking, flexibility and self-confidence (Tehseen and Ramayah, 2015; Bolarinwa and Okolocha, 2016). The inclusion of entrepreneurial competence was important in this study because the development of a successful student self-employment ecosystem requires a set of individual entrepreneurial skills.

4.8.4 Measurement of industry support

Industry support was measured using the contribution of the industry sector towards student self-employment. According to Scheyvens et al. (2016), Pedersen (2018) and Buhmann et al. (2019), industry support is measured through the provision of business workshops, mentorship, coaching and motivation to run a business. Self-employed students should be brought in touch with members of the industry so that they can benefit from their knowledge.

4.8.5 Measurement of government support

This study measured government support through self-employed students' understanding of government policies and programmes (Ahmad and Xavier, 2012). Also highlighted in the measures for government support is the availability of funding, training and agencies in support of SMEs. It was important for this study to measure government policies and programmes in support of SMEs because they influence the success of student self-employment operations. Entrepreneurial policies and programmes of the government provide a solid structure through which self-employed students can benefit. Measuring the knowledge of students on the availability of funding was also important for the

successful development of the student self-employment ecosystem. Self-employed students require funding to sponsor business operations. The importance of training and government agencies in support of student self-employment can also not be overemphasised. Training improves the effectiveness and efficiency of self-employed students. Government agencies are also required to support the operations of self-employed students.

4.8.6 Measurement of social support

In this study, social support was measured through instrumental support, informational support and emotional support (Kahn and Antonucci, 1980; House, 1981; Langford, Bowsher, Maloney and Lillis, 1997). Instrumental support involves the availability of someone, for example a family member or friend, to assist a self-employed student with financial resources and physical responsibilities. Informational support is measured through the availability of family or friends who can offer suggestions or information required to improve the business operations of self-employed students. Emotional support was measured through the availability of a family member or friend that a self-employed student can trust. Instrumental, informational and emotional support is critical in influencing the success of student self-employment.

The measurement scale applied in this study was used in previous similar studies (Kraaijenbrink et al., 2010; Ahmad and Xavier, 2012; Saeed et al., 2015; Gubbins et al., 2020; Nandonde and Malaki, 2020). This means these measures were tested and validated in past research. It was important for this study to apply measures that were tested and validated in previous research because of the need to achieve robustness. Moreso, replication and extension of research is considered useful for two reasons: promotion of generalisation, and guiding against the perpetuation of erroneous and questionable results (Hubbard and Armstrong, 1994). This study aimed at achieving generalisation so that results from the study could be applied in different contexts. Consequently, the study could achieve the expansion of the utility of the tested theory in explaining a phenomenon. The approach applied in this study is consistent with the principle theory of falsification suggested by Calder et al. (1994). The theory of falsification pointed out that theories are universal and they can explain a real-world phenomenon within their domain. This study tested this universality through replications and extensions (Tsikriktsis, 2004). Theories that survive repeated rigorous falsification are acceptable as scientific explanations.

4.9 Questionnaire adaptation and modification

The self-completion questionnaire contained 10 constructs. These constructs included age, gender, academic level, area of study, university initiatives, student self-employment, entrepreneurial

competence, industry support, government support and social support. The data collection instrument format is shown in Table 4.3

Table 4.3 Data collection instrument format

Section	Section summary	Scale development	Rationale
A	Biographic constructs: Covers information about the biographical profile of the respondents (age, gender, academic level and area of study).	Sasikala (2013), Gosh (2014), Baldevbhai (2015) and Lal, Vij and Jain (2015:75)	To determine the biographical patterns of respondents and test how they influence differences in perceptions.
B	Independent construct: Covered by university initiatives	Kraaijenbrink et al. (2010) and Saeed et al. (2015)	Predictor in the measurement model
C	Dependent construct: Student self-employment	Farmer et al. (2011) and Mitchelmore and Rowley (2013)	An outcome of the model.
D	Mediator construct: Entrepreneurial competence, industry support and government support	Villa and Poblete, (2007), Kusmintarti et al. (2016). Scheyvens et al. (2016), Pedersen (2018) and Buhmann et al. (2019)	To establish the mediation effect in the measurement model
E	Moderator construct: Social support	Kahn and Antonucci (1980), House (1981) and Langford et al. (1997)	To evaluate the moderation effect in the measurement model

The questionnaire was four pages long, consisting of sections that covered biographical profile, university initiatives, student self-employment, entrepreneurial competence, industry support, government support and social support. As already indicated, the questionnaire was measured with the use of a five-point Likert scale (*Strongly Disagree* = 1; *Disagree* = 2; *Neutral* = 3; *Agree* = 4; *Strongly Agree* = 5). A copy of the questionnaire is provided in Appendix A.

4.10 Pilot study and pre-testing of the questionnaire

Ensuring the robustness of the questionnaire was of great importance at this stage. This was to ensure that the questionnaire would be effective and efficient in its intended purpose. Blumberg, Cooper and Schindler (2011) argued that the robustness of the measurement instrument is achieved through a pilot study and pre-testing of the questionnaire. A two-stage pilot study and pre-testing process were applied in this study. The stages included involvement of a panel of experts, involvement of the target population, and language editing. It was fundamental to ensure that the measures in the questionnaire were verified by a panel of experts. Consequently, a panel of experts from universities, industry and government were consulted so that their inputs could be considered. The questionnaire was sent to USAf since it was representing the government in the implementation of the EDHE programme. Input

from industry experts was also considered. Furthermore, a process known as the scientific review was carried out to gather inputs from academics before the questionnaire was taken through a robust university ethics approval process. The second stage involved running a pilot study through the intended target population. As already understood, the target population involved self-employed South African university students who participated in the EDHE programme. At least 10 students were gathered to complete the questionnaire. Their input was taken into consideration regarding some questions that were not clear and difficult to understand. Such questions were rephrased and pre-tested again to ensure that students understood the questions. Questions that showed signs of redundancy were also highlighted and removed from the study. After running the questionnaire through the panel of experts and the target population, language editing was involved. Thus, the researcher submitted the questionnaire for language editing to ensure that its clarity was further enhanced. This process was important for ensuring face validity.

4.11 Data analysis

4.11.1 Evaluation of the measurement model

The evaluation of the measurement model was carried out to ensure the reliability and validity of the study through SmartPLS 4. Hair et al. (2019) presented the five-stage criteria that should be taken by researchers to ensure the robustness of the measurement model. These included an assessment of factor loadings (FL), composite reliability (CR, Cronbach's Alpha (CA), convergent validity and discriminant validity. These five requirements for the evaluation of the measurement model are explained in the following subsections.

4.11.1.1 Factor loading

The researcher needs to evaluate the indicator loadings. The indicator loadings for the measurement model should reach a minimum recommended threshold of 0.708 (Hair et al., 2019). Reaching a threshold of 0.708 is an explanation that the construct represented explains more than 50 per cent of the indicator's variance. This is also an indication of the item's reliability. Items that do not reach this minimum required threshold should be removed to avoid having them for further analysis.

4.11.1.2 Composite reliability

The next stage of the measurement model evaluation process is the composite reliability assessment. To evaluate internal consistency reliability, one can use Joreskog's (1971) composite reliability. Achieving greater composite reliability levels is a sign of high internal consistency reliability. According to Hair et al. (2019), values in the range of 0.60 and 0.70 are regarded as appropriate in exploratory

research. A composite reliability of 0.70 to 0.90 falls into the *satisfactory* to *good* categories. However, composite reliability should not reach 0.95 as it is considered problematic. Reaching 0.95 is a sign of redundancy within the measurement construct (Drolet and Morrison, 2001; Diamantopoulos et al., 2012). A composite reliability that reaches 0.95 also indicates an undesirable response pattern triggering inflated correlations among the indicator's error terms.

4.11.1.3 Cronbach's Alpha

The next step involves the assessment of Cronbach's Alpha which is also a measure of internal consistency reliability. Cronbach's Alpha assumes a similar threshold (0.70) to composite reliability but produces lower values than the latter. Hair et al. (2019) posited that Cronbach's Alpha is a less precise measure of reliability since the items are unweighted.

4.11.1.4 Convergent validity

Assessing convergent validity is a critical next step in evaluating the measurement model. On each of the constructs contained in the measurement model, the convergent validity should be evaluated. Convergent validity is the degree to which the construct converges to explain the variance of its items, according to Hair et al. (2019). The convergent validity of each of the construct's items is evaluated using the average variance extracted (AVE) metric. In order to demonstrate that the construct accounts for at least 50% of the variance of its items, AVE must meet a minimum threshold of 0.50.

4.11.1.5 Discriminant validity

The degree to which one construct in the structural model is empirically different from other constructs is known as discriminant validity (Hair et al., 2019). To evaluate discriminant validity, one should use the correlations' heterotrait-monotrait (HTMT) ratio (Henseler, Ringle, and Sarstedt, 2015; Voorhees, Brady, Calantone, and Ramirez, 2016). The mean of an item's correlations across constructs divided by the mean of the average correlations for items measuring the same construct is another definition of HTMT. It should be mentioned that too high HTMT values are not appropriate. The values above imply that there is no discriminant validity, and as a result, a maximum threshold of 0.90 should be followed (Henseler et al., 2015).

4.11.2 Structural equation modelling

This study made use of SEM through SmartPLS 4 to measure the effect of university initiatives on student self-employment in South Africa. VIF was assessed as a condition necessary before carrying out SEM. VIF assessed the collinearity of the formative indicators to ensure that they are not highly correlated with each other. Hair, Sarstedt, Ringle and Gudergan (2018) argued that VIF values of 5 and

above indicate high collinearity. However, Mason and Perreault (1991) and Becker, Ringle, Sarstedt and Völckner (2015) argued that VIF with a lower level value of 3 reflects problematic collinearity. Therefore, this study took the principle to accept only VIF close to, but lower than 3 (Mason and Perreault, 1991). After ensuring that only indicators with acceptable collinearity are kept in the model, the bootstrapping procedure followed. Using a bootstrapping procedure at 5 000 subsamples with 95 per cent confidence interval, the effect of university initiatives on student self-employment was measured using SEM. The p value, t statistic, and β were used as the basis for assessing SEM. The p value and t statistics were used to assess the statistical significance of the tested relationship, where p value ≤ 0.05 and t statistic ≤ 1.96 are considered statistically significant. The β measures the strength and direction of the effect of one construct on another. Thus, β ranges from -1 to 1 , where -1 reflects a perfect negative effect, 1 is a perfect positive effect, -0.5 a moderate negative effect, 0.5 a moderate positive effect and 0 non-existing effect. This study also assessed the R^2 which is the explanatory power of the predictor construct. The R^2 ranges between 0 and 1 , where a higher value indicates a higher explanatory power of the predictor construct on the outcome construct.

4.11.3 Mediation analysis

Mediation analysis was also carried out to test the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment. The bootstrapping procedure at 5 000 subsamples with a 95 per cent confidence interval was also used to perform the test. Mediation analysis was only carried out after the consideration of the conditions that should be present for mediation to exist. The conditions included a statistically significant relationship between a predictor and a mediator, and a mediator and the outcome. Mediation analysis involved the assessment of the direct and indirect effects of the mediators. The results of mediation analysis were interpreted using p value, t statistic, and β . Mediation analysis is divided into partial and full mediation. Partial mediation assumes that both direct and indirect effects are significant, whereas if the indirect effect is significant and the direct effect is not significant then full mediation will be assumed (Cheung and Lau, 2008).

4.11.4 Moderation analysis

Moderation analysis was carried out to establish the moderation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support. The bootstrapping method at 5 000 subsamples with a 95 per cent confidence interval was applied to test moderation. Two conditions required for moderated mediation to exist were assessed. According to Muller et al. (2005) and

Preacher et al. (2007), there should be significant interaction between the predictor and the moderator on mediating constructs and the mediator and moderator on the outcome construct.

4.12 Limitations of the methodology

Only a few limitations were identified as impacting the current study. These limitations included the nature of the sample, time, measurement scale and geographical scope. It should be noted that this study considered a sample that was limited to self-employed university students in South Africa. It needs to be noted that university students are not the only representation of students involved in entrepreneurship. It should be acknowledged that there are students at public technical and vocational education and training (TVET) colleges, private TVET colleges and other colleges in South Africa who are also involved in entrepreneurship. This study left out such students in the research sample. Also, the time that was used to carry out this study was limited. This study was carried out using a cross-sectional research approach to comply with the limited competition time set by the university. Also, the measurement scale applied in this study to determine student self-employment was limited to university initiatives, entrepreneurial competence, industry support, government support and social support. It should be noted that other factors are also fundamental in the determination of successful student self-employment. This study was also carried out in South Africa and this means it does not necessarily represent the phenomenon in the rest of Africa and the world. However, despite these highlighted limitations, this study still held critical implications for theory and practice. Its mandate in the creation of a comprehensive student self-employment ecosystem was still achieved.

4.13 Ethical considerations

This study followed the ethical requirements as stipulated by the University of the Free State's Research Ethics Committee. Ethics considerations were carried out to protect the respondents, their institutions, the researcher, her institution and the environment. Thus, a set of standards was adhered to in this study as discussed below.

4.13.1 Permission to carry out the study

The permission to carry out the study was obtained from USAf before the study was conducted. Thus, USAf, through the EDHE programme, permitted to collect data through its events. Thus, the researcher was allowed to carry out data during the Annual EDHE Lekgotla and the EDHE Studentpreneurs Indaba 2023.

4.13.2 Informed consent

Informed consent was obtained from the participating respondents. As already noted, participating respondents included self-employed university students. These students provided informed consent to the researcher before they could participate in the study (Patton 2002; Thompson and Perry 2004).

4.13.3 Right to withdraw

The respondents were given the right to withdraw from participating in the study without being questioned or compromising their membership in the EDHE programme. However, students were also informed that they would not be able to withdraw their participation once they have already completed and submitted the questionnaire.

4.13.4 Right to anonymity and confidentiality

The right to anonymity and confidentiality of the research respondents was safeguarded. The right to anonymity and confidentiality was also extended to the research respondents' institutions. Thus, the data obtained in this research was reported as group data without linking it to a specific student or institution.

4.13.5 Storing of data

The data that were collected was returned and safeguarded in a locked cabinet where access is controlled. Also, electronic data were stored in a password-protected computer for five years. However, the data will be disposed of after five years.

4.13.6 Provision of researcher's contact details

The contact details of the researcher, such as email and telephone number, were disclosed to the research respondents. This was done to enable the research respondents the opportunity to contact the researcher in case they had any concerns regarding the research.

4.13.7 Exposure to psychological risk

At no point were the research respondents exposed to any form of psychological risk, except the loss of time to attend the EDHE workshop. However, to mitigate this risk, the research respondents were advised to complete the questionnaire during their free time.

4.13.8 Data collection instrument

The data collection instrument applied in this study was taken through the ethics clearance committee for approval.

4.14 Chapter summary

This chapter presented the research methodology that was applied by the researcher in this study. This chapter also indicated that the researcher made use of the positivist research paradigm since it was consistent with the quantitative research methodology. This chapter also presented that the research made use of the quantitative research methodology and the descriptive research design. Also, presented in this chapter is the target population and sampling technique that was applied by the researcher. A convenience sample of self-employed university students who participated in the EDHE programme was involved in this study. The chapter also deliberated on the data collection procedures and data analysis. A survey technique and statistical analysis methods were applied to operationalise the research objectives. The next chapter presents the data analysis and a discussion of the findings.



Chapter 5

DATA ANALYSIS AND DISCUSSION OF FINDINGS

5.1 Chapter overview

The previous chapter has presented the research methodology applied in this study. In the current chapter, interest is drawn on data analysis and discussion of the findings. This chapter is, therefore, subdivided into the discussion of five main sections. These sections include the introduction; biographical profile of the respondents; evaluation of students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment; evaluation of the measurement model; evaluation of the structural equation model, mediation, moderation and finally the summary.

5.2 Introduction

As indicated in Chapters 1 and 4, this study had five research objectives. The first research objective aimed at evaluating student perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa. The second research objective aimed at measuring the effect of university initiatives on student self-employment in South Africa. The third research objective aimed at measuring the effect of social support on entrepreneurial competence. The fourth research objective was concerned with establishing the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment in South Africa. The fifth research objective aimed at investigating the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa.

The first research objective was operationalised through descriptive statistics in the form of mean, standard deviation, skewness and kurtosis. The remaining research objectives were analysed using mean, standard deviation, SEM, mediation and moderation analysis in SmartPLS 4 as highlighted in Chapter 4. It was also of interest to the researcher to consider the biographical profile of the respondents as presented in the next section.

5.3 Biographical profile of the sample

The biographical profile of the respondents included age, gender, academic level and area of study. Including the biographical profile was fundamental to understanding the general characteristics of the respondents. Also, this biographical profile is presented in this study (Table 5.1) as control variables as shall be discussed in the subsequent sections of this chapter.

Table 5.1 Biographical profile of respondents (n = 375)

Biographical profile		Frequency	Per cent
Age	18-19 years	85	22.7
	20-21 years	134	35.7
	22-24 years	101	26.9
	25-29 years	50	13.3
	30-35 years	5	1.3
Gender	Female	202	53.9
	Male	173	46.1
Academic level	Undergraduate degree	331	88.3
	Honours degree/Postgraduate diploma	32	8,5
	Master's degree	7	1,9
	Doctoral degree	5	1,3
Area of study	Economic and Management Sciences	65	17,3
	Health Sciences	21	5,6
	Law	24	6,4
	Humanities	69	18,4
	Education	35	9,3
	Natural and Agricultural Sciences	140	37,3
	Engineering	3	0,8
	Information Technology	5	1,3
	Other	13	3,5

In terms of age, 22.7 per cent of the study respondents were within the age group 18-19 years, 35.7 per cent were in the age group 20-21 years, 26.9 per cent were in the age group 22-24 years, 13.3 per cent in the age group 25-29 years and 1.3 per cent were in the age group 30-35 years. These findings show that only the Millennials and Generation Z respondents participated in this study. Millennials refer to people born from 1980 to 1994 and Generation Z are those born from 1995 to 2012 (Weiss and Zhang, 2020; University of Southern California, 2023). However, the majority of respondents were within the Generation Z category. In terms of gender, 53.9 per cent were female while 46.1 per cent

were male. The majority of respondents in this study were, therefore, female respondents. This validates the evidence presented by Sajjad, Kaleem, Chan and Ahmed (2020) regarding the increased entrepreneurship participation of women across the world.

Regarding the academic level, 88.3 per cent of the respondents were pursuing undergraduate degrees, 8.5 per cent were pursuing honours degrees, 1.9 per cent were doing their masters and 1.3 per cent their doctoral degrees. Therefore, the majority of the respondents were pursuing an undergraduate degree. Regarding area of study, 17.3 per cent were enrolled in the economic and management sciences, 5.6 per cent in the health sciences, 6.4 per cent in law and 18.4 per cent in humanities. Furthermore, 9.3 per cent were enrolled in education, 37.3 per cent in natural and agricultural sciences, 0.8 per cent in engineering, 1.3 per cent in information technology and 3.5 per cent in other unspecified areas of study. The majority of respondents were in economic and management sciences, humanities, and natural and agricultural sciences. It is interesting to note that participation in entrepreneurship was not only confined to students enrolled in economic and management sciences but across different disciplines. The next section presents students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards and student self-employment.

5.4 Evaluation of students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa

The first empirical research objective was to assess self-employed students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment. A total of 37 items were used to assess these constructs. University initiatives were measured through six items, entrepreneurial competence through three sub-constructs (i.e., instrumental generic competence, interpersonal generic competence, and systematic generic competence) with four items each and industry support measured through four items. Government support, social support and student self-employment were also measured through five items each. A five-point Likert scale in the form of *strongly disagree* = 1; *disagree* = 2; *neutral* = 3; *agree* = 4 and *strongly agree* = 5 was used to assess the respondents' perceptions of these constructs. Table 5.2 shows the summated findings illustrated through mean, standard deviation, skewness, and kurtosis.

Table 5.2 University students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa - descriptive (n = 375)

Constructs and items		Mean	Standard deviation	Skewness	Kurtosis
University initiatives (UN)		2.55	1.21	0.29	-0.79
UN1	I am aware of entrepreneurship coaching at my university	2.45	1.25	0.42	-0.92
UN2	I am aware of an office that offers entrepreneurship mentorship at my university	2.18	1.15	0.83	-0.11
UN3	I am aware of entrepreneurship workshops at my university	2.44	1.22	0.36	-0.99
UN4	My university creates awareness of entrepreneurship as a career choice	2.93	1.25	-0.11	-0.93
UN5	My university motivates students to start a new business	2.79	1.23	-0.03	-1.01
UN6	My university provides students with ideas to start a new business	2.55	1.19	0.27	-0.83
Entrepreneurial competence					
Instrumental generic competence (INS)		3.72	0.88	-0.52	0.38
INS1	I have acquired decision-making skills	3.84	0.90	-0.87	1.04
INS2	I can manage my time very well	3.49	0.97	-0.32	-0.11
INS3	I am good at finding new information	3.83	0.81	-0.32	0.04
INS4	I am good at interpreting information	3.75	0.87	-0.59	0.57
Interpersonal generic competence (INT)		3.73	0.95	-0.57	0.11
INT1	I have human relations skills	3.80	0.97	-0.66	0.21
INT2	I have networking skills	3.46	1.03	-0.33	-0.39
INT3	I have interpersonal skills	3.82	0.92	-0.74	0.56
INT4	I have commitment skills	3.85	0.91	-0.55	0.06
Systematic generic competence (SYS)		3.80	0.97	-0.71	0.32
SYS1	I am generally innovative	3.59	0.84	-0.18	-0.16
SYS2	I am comfortable with taking a risk	3.76	1.01	-0.70	0.12
SYS3	I am generally flexible to change	3.85	0.98	-0.89	0.62
SYS4	I have self-confidence	4.00	1.06	-1.08	0.72
Industry support (IS)		2.02	1.07	1.01	0.42
IS1	I have attended business workshops presented by people from the industry at my university	2.02	1.12	1.02	0.16
IS2	I have received business mentorship given by people from the industry at my university	1.97	1.01	1.04	0.58
IS3	I have received business coaching given by people from the industry at my university	1.92	0.97	1.16	1.17
IS4	I have received motivation to run a business from people from the industry at my university	2.18	1.18	0.82	-0.23
Government support (GS)		2.10	1.06	0.84	0.12
GS1	I was informed about government policies that support small businesses at my university	2.27	1.20	0.71	-0.50
GS2	I was informed about government programmes that support small businesses	2.39	1.23	0.57	-0.70

GS3	Government people have informed me about funding that supports small businesses at my university	2.07	1.04	0.86	0.14
GS4	I have attended business training provided by the government people at my university (i.e., registering a company)	1.83	0.89	1.16	1.35
GS5	Government people have informed me about government agencies that support small businesses at my university	1.94	0.97	0.94	0.32
Student self-employment (SSE)		2.87	1.17	-0.08	-0.62
SSE1	I understand how to write a business plan	2.85	1.24	0.11	-0.95
SSE2	I know how to apply for business funding	2.38	1.13	0.60	-0.29
SSE3	I believe I have good business ideas	3.46	1.18	-0.48	-0.50
SSE4	I know how to get the information required for business	3.10	1.18	-0.05	-0.84
SSE5	I have gained enough skills to run a business	2.60	1.14	0.24	-0.56
Social support (SS)		3.41	1.16	-0.54	-0.16
SS1	There is someone (i.e., friends or family) to give me financial assistance	2.78	1.30	0.10	-1.16
SS2	There is someone (i.e., friends or family) to help me fulfil my business responsibilities when I am unable	2.69	1.21	0.17	-1.01
SS3	I have someone (i.e., friends or family) to help me if I am physically unwell	3.63	1.14	-0.72	-0.16
SS4	I have someone (i.e., friends or family) who can offer suggestions when I need help	3.83	1.10	-0.91	0.28
SS5	I have someone (i.e., friends or family) I can trust	4.15	1.08	-1.34	1.25

To assess the normality of the sample data, skewness and kurtosis were applied. Griffin and Steinbrecher (2013) stated that normal data has skewness and kurtosis that range between -3 and +3. As shown in Table 5.2, the data ranged between -3 and +3 for both skewness and kurtosis. After establishing that the data were normal, the analyses proceeded to mean and standard deviation to assess students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment.

5.4.1 Students' perceptions of university initiatives

The results indicated that self-employed students had low perceptions of university initiatives towards student self-employment. This is evidenced by a mean value of 2.55 on university initiatives. As already indicated, university initiatives were measured through six items. The results showed that students had low perceptions of university initiatives as evidenced by a considerably low mean of all six items, as shown in Figure 5.1.

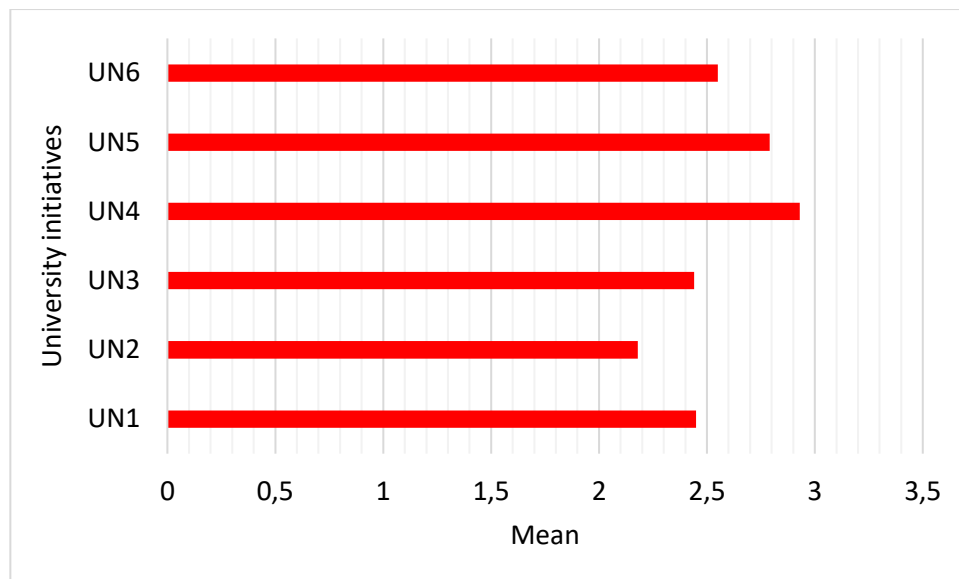


Figure 5.1 *Students' perceptions of university initiatives*

Source: Author's own construction

The results showed that students were not aware of entrepreneurship coaching (UN1) and mentorship (UN2) taking place within the university. There was also evidence that suggested that students were not aware of entrepreneurship workshops (UN3) taking place at their university. Students also indicated that they were not aware of initiatives that create awareness of entrepreneurship as a career choice (UN4). The results also showed that students were not aware of the effort made by the university to motivate (UN5) and provide ideas to students into entrepreneurship (UN6). Liu et al. (2022) argued that universities should play a fundamental role as seedbeds for establishing a conducive environment for student entrepreneurship. Coduras et al. (2008) and Saeed et al. (2015) also posited that universities' learning and teaching goals should stimulate entrepreneurship among students. However, the results of this study suggested that universities were not doing enough to promote student entrepreneurship.

5.4.2 Students' perceptions of entrepreneurial competence

The results in Table 5.2 showed that students had moderate positive perceptions of their entrepreneurial competence. This was evidenced by instrumental generic competence with a mean value of 3.72, interpersonal generic competence with 3.73 and systematic generic competence with 3.80. Students also had moderate perceptions of all the items that were applied to measure entrepreneurial competence. Figure 5.2 illustrates student perceptions of entrepreneurial competence.

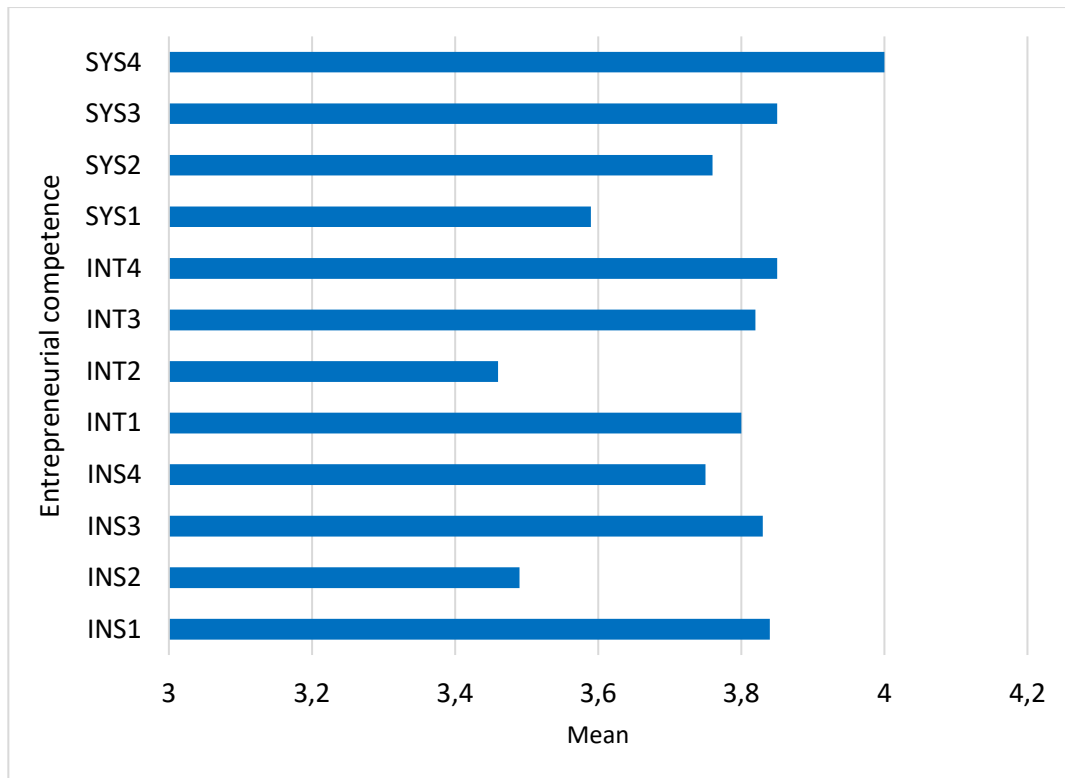


Figure 5.2 *Students' perceptions of entrepreneurial competence*

Source: Author's own construction

The results in Figure 5.2 indicated that students had moderate perceptions of their decision-making skills (INS1), the ability to manage time well (INS2), finding new information (INS3) and interpreting information (INS4). Also, the results showed that students had moderate perceptions of their human relations skills (INT1), networking skills (INT2), interpersonal skills (INT3) and commitment skills (INT4). Moreover, it was shown that students had moderate perceptions of their innovative skills (SYS1), taking a risk (SYS2), flexibility to change (SYS3) and self-confidence (SYS4). Tehseen and Ramayah (2015) showed that entrepreneurial competence is important by describing it as an intangible and valuable asset. Wu (2021) also argued that entrepreneurial competence results in successful student self-employment. Furthermore, Kusmintarti et al. (2016), Peric, Grladinovic, Kropivsek and Greger (2017), Al Mamun and Fazal (2018), Nakhata (2018) and Bosma and Kelley (2019) stated that numerous advantages come as a result of entrepreneurial competence. These advantages were presented as stimulation to business performance, survival, growth, effective use of resources, profits, problem-solving and innovativeness. In this study, the students indicated that their entrepreneurial competence was moderate. It will be ideal for students' entrepreneurial competence to be improved to high levels so that they enjoy the full advantages that come with the competence.

5.4.3 Students' perceptions of industry support

The results indicated that students had low perceptions of industry support towards student self-employment as evidenced by the mean value of 2.02. As already indicated, industry support was measured through four items. All four items used to measure industry support had mean values between 1.92 and 2.18, which is evidence of low perceptions. Figure 5.3 illustrates student perceptions of industry support.

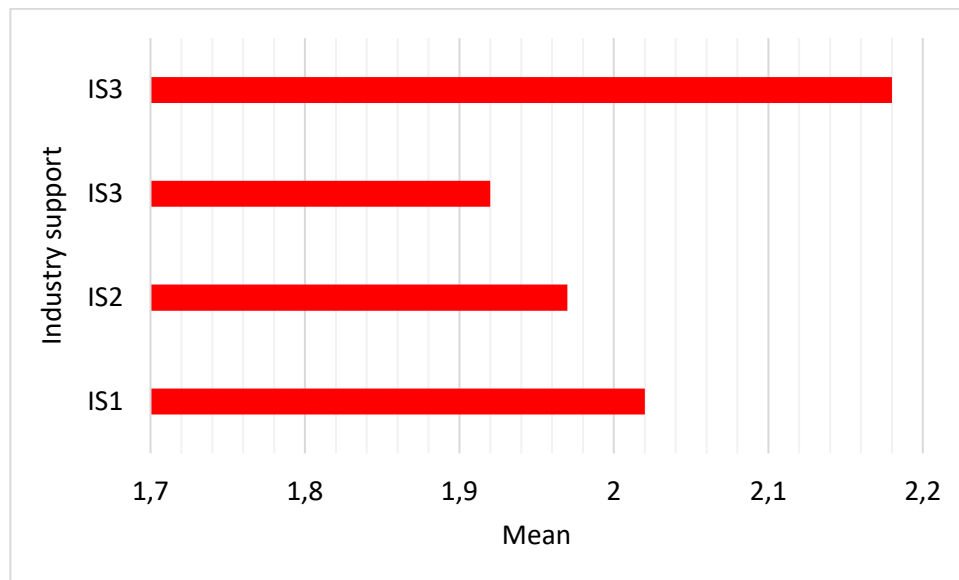


Figure 5.3 Students' perceptions of industry support

Source: Author's own construction

This study found that students did not receive sufficient business workshops from the industry (IS1). Also, highlighted in this study is that industry people did not give sufficient business mentorship (IS2), coaching (IS3) and motivation (IS4) to stimulate student self-employment. Gachie and Govender (2017) argued that the triple helix model functions efficiently when the industry fully performs its role. Feola et al. (2019) confirmed that the industry needs to be given a platform to work with universities and the government to fully benefit students pursuing self-employment. Ranabahu et al. (2020) indicated that the industry plays a role through the provision of internships to students. Mitchelmore and Rowley (2013), Park et al. (2020) and Ranabahu et al. (2020) also indicated that the industry should contribute by supporting the capability of students in areas such as marketing, finance and general operations since it adds value to student self-employment.

5.4.4 Students' perceptions of government support

The results showed that students had low perceptions of government support towards student self-employment. This finding is supported by the overall low mean value for government support which

is 2.10. Furthermore, all five items representing government support had a low mean value. Students' low perceptions of government support are illustrated in Figure 5.4.

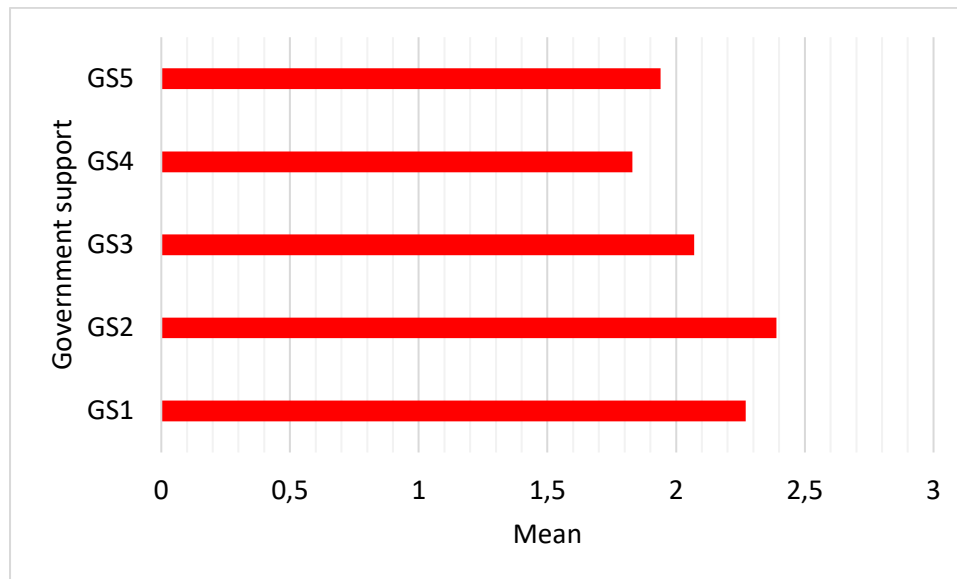


Figure 5.4 *Students' perceptions of government support*

Source: Author's construction

Thus, the students felt that government did not provide enough information regarding policies (GS1) and programmes (GS2) that support student self-employment. Also, the students indicated that the government did not provide them with information regarding funds to support student self-employment (GS3). It was also indicated that there was not sufficient business training (i.e., regarding company registration) provided to students by the government at their university (GS4). Also, the government did not provide sufficient information regarding government agencies that support student self-employment (GS5). In contrast to the findings of this study, Fini et al. (2011) indicated that the government needs to contribute to the development of student self-employment. These researchers further indicated that government support towards student self-employment should be provided through financial incentives and setting up entrepreneurship-supportive institutions. The argument for supporting student self-employment is also supported by Gachie (2020) who highlighted that the government needs to set up incubators and science parks as a commitment to support student self-employment. Fini et al. (2011, 2017) and Gachie (2020) argued that it is the responsibility of the government to expose students to entrepreneurship.

5.4.5 Students' perceptions of social support

The results indicated that student perceptions of social support were moderate as indicated by the mean value of 3.41 for social support. Three of the five items used to measure social support showed

that there were moderate to high perceptions of social support towards student self-employment. However, two items had low perceptions of social support. Figure 5.5 illustrates students' perceptions of social support.

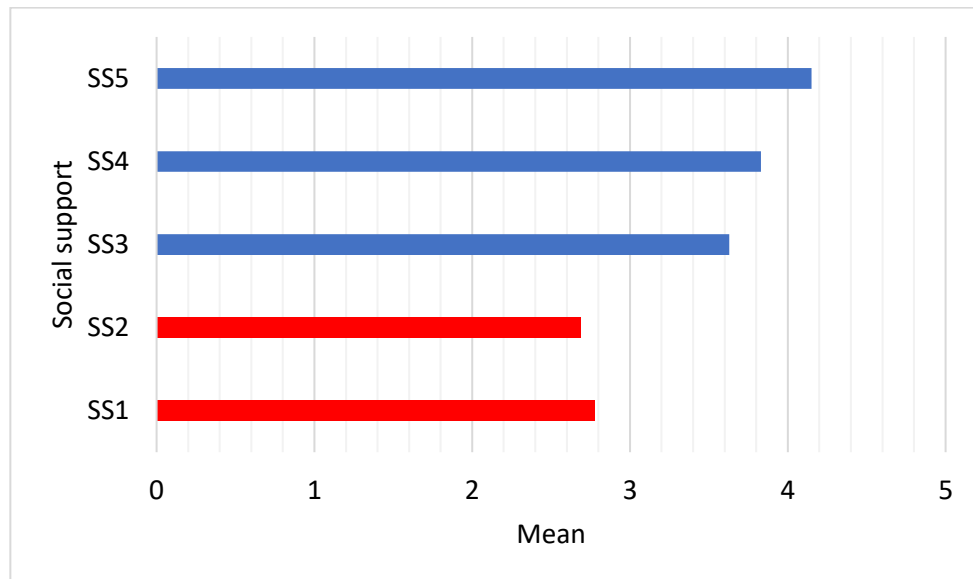


Figure 5.5 Students' perceptions of social support

Source: Author's construction

Thus, the students indicated that there were friends and family who can help when they feel physically unwell (SS3). The students also indicated that they had friends and family who could offer suggestions when they needed help (SS4). They also indicated that they had friends and family they can trust (SS5). However, some students also indicated that they did not have friends and family who could provide financial assistance (SS1). Also, the students indicated that they did not have friends and family who could help to fulfil business responsibilities when they are unable (SS2). Researchers have shown that social support is a crucial element in achieving student self-employment (Matzek, Gudmunson and Danes, 2010; Levesque, 2014; Welsh, Kim, Memili and Kaciak, 2014; Sahban et al., 2016). Matzek et al. (2010), Levesque (2014) and Welsh et al. (2014) pointed out that social support in the form of finance, emotional support and physical assistance is required to achieve successful entrepreneurship. This section focused on presenting and discussing university students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa.

5.4.6 Students' perceptions of student self-employment

Student had low perceptions of student self-employment as evidenced by a low mean value of 2.87. The results further showed that students had low perceptions of three items measuring student self-employment (SSE1, SSE2 and SSE5). However, students had moderate perceptions on two students'

self-employment items (SSE3 and SSE4). Figure 5.6 provides an illustration of students' perceptions of self-employment.

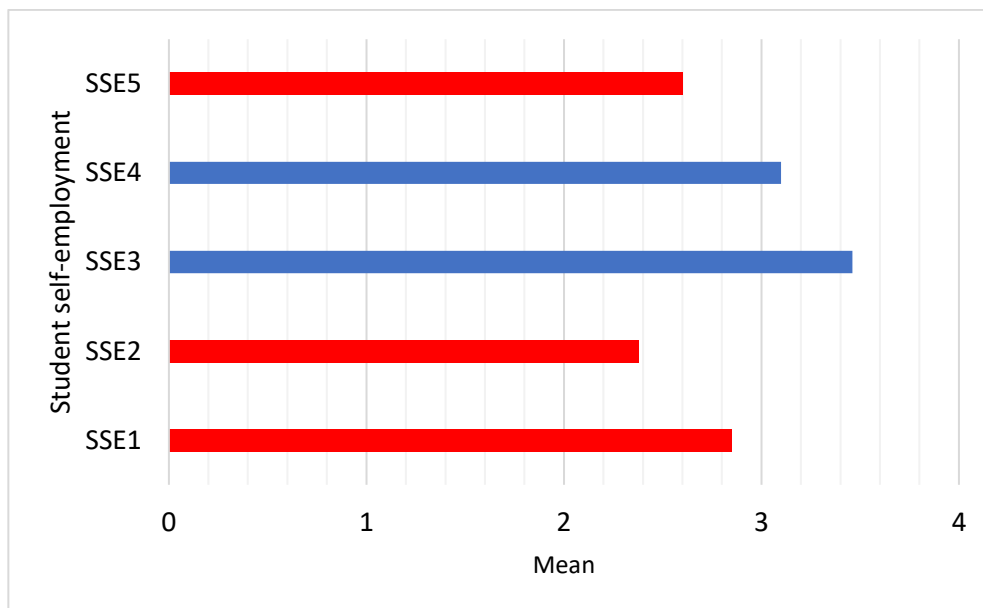


Figure 5.6 *Students' perceptions of self-employment*

Source: Author's own construction

This study has shown that students did not have a good understanding of writing a business plan (SSE1) and application for business funding (SSE2). The results also showed that students did not have enough skills to run a business. However, the results showed that students had moderate perceptions of their business ideas and skills on how to get the required information. It is concerning to realise that students had low perceptions of items that form student self-employment, for example, writing a business plan, application of business funding and running a business. Authors such as Halvorsen and Howell (2016), Raphael (2020), Lawrence et al. (2021) and Salas-Velasco (2023) warned against the inability to write a business plan, sourcing of funding and running business operations. It was highlighted that entrepreneurship ventures have lost competitive advantage due to an inability to prepare business plans, sourcing of funding and running business operations (Halvorsen and Howell, 2016; Raphael, 2020; Lawrence et al., 2021; Salas-Velasco, 2023). The results in this section showed that there is a need to develop a comprehensive framework to improve student self-employment. The next section presents the evaluation of the measurement model.

5.5 Evaluation of the measurement model

The primary research objective of the study was to develop a multi-tiered student self-employment ecosystem that functions based on university initiatives, industry support, government support, social support and entrepreneurial competence in South Africa. As a mechanism to develop this multi-tiered

student self-employment ecosystem, four empirical research objectives (Objectives 2 to 5) were developed as shown in section 5.2. However, before these empirical research objectives were operationalised, an evaluation of the measurement model had to take place. Hair et al. (2019) recommended that before SEM, mediation and moderation can take place, an evaluation of the measurement model should be facilitated to ensure that the model meets the required threshold for reliability and validity. Evaluation of the measurement model was carried out by assessing factor loadings (FL), Cronbach's Alpha (CA), composite reliability (CR), convergent validity (average variance extracted - AVE) and discriminant validity through the Fornell-Larker Criterion and the HTMT ratio of correlations (Hair et al., 2019).

It should be ensured that FL reaches a minimum threshold of 0.708 on each item representing a construct (Hair et al., 2019). Achieving a minimum threshold of 0.708 on the items indicates that the construct explains more than 50 per cent of the indicator's variance which provides acceptable item reliability. CA as a measure of internal consistency should reach at least 0.7 for each construct in the measurement model (Hair et al., 2019). CR is also another measure of internal consistency that should reach a minimum threshold of 0.7 but not 0.95 and above. CR values that reach and exceed 0.95 are regarded as problematic since they highlight that items used are redundant, which reduces construct validity (Drolet and Morrison, 2001; Diamantopoulos et al., 2012). A minimum threshold of 0.5 is required to indicate that the construct explains at least 50 per cent of the variance of its items (Hair et al., 2019). The Fornell-Larker Criterion should satisfy the assumptions advanced by Fornell and Larcker (1981) who stated that the AVE square roots stipulated in bold as a diagonal should be greater than their correlation coefficients.

As an additional measure of discriminant validity, HTMT values should not exceed 0.9, and lower values are appreciated since they provide a strong indication that constructs are distinct from each other (Henseler et al., 2015; Franke and Sarstedt, 2019). The evaluation of the measurement model was carried out using the partial least squares structural equation modelling (PLS-SEM) algorithm in SmartPLS 4 to calculate FL, CA, CR, AVE and discriminant validity. The results of the measurement model are shown in Table 5.3.

Table 5.3 Evaluation of the model

Constructs	Items	FL	CA	CR	AVE
University initiatives	UN1	0.838	0.903	0.905	0.674
	UN2	0.798			
	UN3	0.783			
	UN4	0.851			
	UN5	0.853			
	UN6	0.799			
Instrumental generic competence	INS1	0.679	0.692	0.697	0.764
	INS2	0.682			
	INS3	0.889			
	INS4	0.859			
Interpersonal generic competence	INT1	0.763	0.776	0.779	0.597
	INT2	0.786			
	INT3	0.819			
	INT4	0.719			
Systematic generic competence	SYS1	0.763	0.655	0.654	0.591
	SYS2	0.799			
	SYS3	0.744			
	SYS4	0.688			
Industry support	IS1	0.805	0.877	0.883	0.731
	IS2	0.874			
	IS3	0.905			
	IS4	0.833			
Government support	GS1	0.852	0.902	0.904	0.719
	GS2	0.840			
	GS3	0.884			
	GS4	0.798			
	GS5	0.861			
Student self-employment	SSE1	0.776	0.847	0.855	0.621
	SSE2	0.751			
	SSE3	0.758			
	SSE4	0.854			
	SSE5	0.798			
Social support	SS1	0.609	0.776	0.779	0.598
	SS2	0.694			
	SS3	0.799			
	SS4	0.848			
	SS5	0.736			

Source: PLS-SEM algorithm calculation results

The results showed that INS1, INS2, SYS4, SS1 and SS2 could not meet the required threshold for FL. Consequently, the aforementioned items were removed from the measurement model. After removing these five items, the PLS-SEM algorithm was run again and the remaining 32 items met and exceeded the 0.708 minimum required threshold for FL (Hair et al., 2019). However, CA and CR for

instrumental generic competence, and systematic generic competence could not reach the minimum required threshold of 0.7 needed for internal consistency. Therefore, instrumental generic competence and systematic generic competence were removed from the measurement model. The remaining constructs included university initiatives, interpersonal generic competence, industry support, government support, student self-employment and social support that had a CA and CR ranging between 0.776 and 0.905, which are acceptable thresholds for internal consistency (Drolet and Morrison, 2001; Diamantopoulos et al., 2012). Also, the AVE for these constructs had acceptable values ranging between 0.597 and 0.731 (Hair et al., 2019). As already indicated in the current section, the Fornell-Larker Criterion and HTMT were applied to measure the discriminant validity of the remaining constructs. Table 5.4 shows the results of discriminant validity through the Fornell-Larker Criterion.

Table 5.4 Discriminant validity – Fornell-Larker Criterion

Constructs	GS	IS	INT	SS	SSE	UN
Government support (GS)	0.848					
Industry support (IS)	0.600	0.855				
Interpersonal generic competence (INT)	0.167	0.206	0.772			
Social support (SS)	0.172	0.119	0.225	0.773		
Student self-employment (SSE)	0.384	0.390	0.382	0.176	0.788	
University Initiatives (UN)	0.527	0.595	0.206	0.146	0.329	0.821

Table 5.5 Heterotrait–monotrait ratio of the correlations

Constructs	GS	IS	INT	SS	SSE	UN
Government support (GS)						
Industry support (IS)	0.672					
Interpersonal generic competence (INT)	0.198	0.243				
Social support (SS)	0.195	0.142	0.284			
Student self-employment (SSE)	0.428	0.441	0.451	0.204		
University Initiatives (UN)	0.579	0.665	0.243	0.169	0.367	
Social support	0.051	0.089	0.070	0.152	0.049	0.034

Source: PLS-SEM algorithm calculation results

As shown in Tables 5.4 and 5.5, the measurement model satisfied the assumptions advanced by Fornell and Larcker in 1981, which stated that the AVE square roots stipulated in bold as a diagonal should be greater than their correlation coefficients (Hair et al., 2019). Also, the intercorrelations for HTMT ranged between 0.049 and 0.665, which is evidence that the constructs of the measurement model were empirically distinct from each other (Henseler et al., 2015; Franke and Sarstedt, 2019). After

ascertaining that the measurement model has acceptable thresholds for FL, CA, CR, AVE and discriminant validity, the analysis proceeded to the evaluation of the structural equation model.

5.6 Evaluation of the structural equation model and hypotheses testing

The previous section presented results on the evaluation of the measurement model that established the reliability and validity of the items and constructs in the study. This section proceeds to evaluate the direct relationships, mediation and moderation in the hypothesised study model. However, before these evaluations can take place the determination of the collinearity of the items in the measurement model should be considered. The consideration of collinearity is a fundamental step that is meant to ensure that it does not give bias to the results (Hair et al., 2019). Collinearity is measured through the variance inflation factor (VIF). According to Mason and Perreault (1991) and Becker et al. (2015), a VIF equal to 3 or above should be considered problematic. Hair et al. (2019) highlighted that the ideal VIF should be close to 3 and lower. Table 5.6 presents the VIF results.

Table 5.6 Variance inflation factor

	GS	INT	IS	SS	SSE	UN
GS1	2.984					
GS2	2.917					
GS3	3.166					
GS4	2.492					
GS5	3.437					
INT1		1.754				
INT2		1.524				
INT3		1.856				
INT4		1.275				
IS1			1.980			
IS2			2.644			
IS3			2.998			
IS4			2.012			
SS3				1.917		
SS4				2.025		
SS5				1.523		
SSE1					1.799	
SSE2					1.640	
SSE3					1.849	

	GS	INT	IS	SS	SSE	UN
SSE4					2.330	
SSE5					1.734	
UN1						2.736
UN2						2.505
UN3						2.221
UN4						2.741
UN5						3.350
UN6						2.662
Social support						1.000

Source: PLS-SEM algorithm calculation results

The results in Table 5.6 indicate that a VIF for GS3, GS5 and UN5 was problematic since it exceeded the required threshold of less than 3 as recommended by Hair et al. (2019). Therefore, the aforementioned items were removed from the measurement model since they indicated the presence of collinearity. Also, R^2 was considered to measure the variance which was explained in each of the endogenous constructs. Thus, R^2 measures the model's explanatory power. The R^2 of the model in this study was 0.298, which was satisfactory considering that there was only one predictor construct. Usually, R^2 is expected to rise as predictor constructs are increased. After collinearity and R^2 were considered, the bootstrapping procedure was carried out with 5 000 subsamples to test the hypothesised study model. Figure 5.6 shows the results of the structural model.

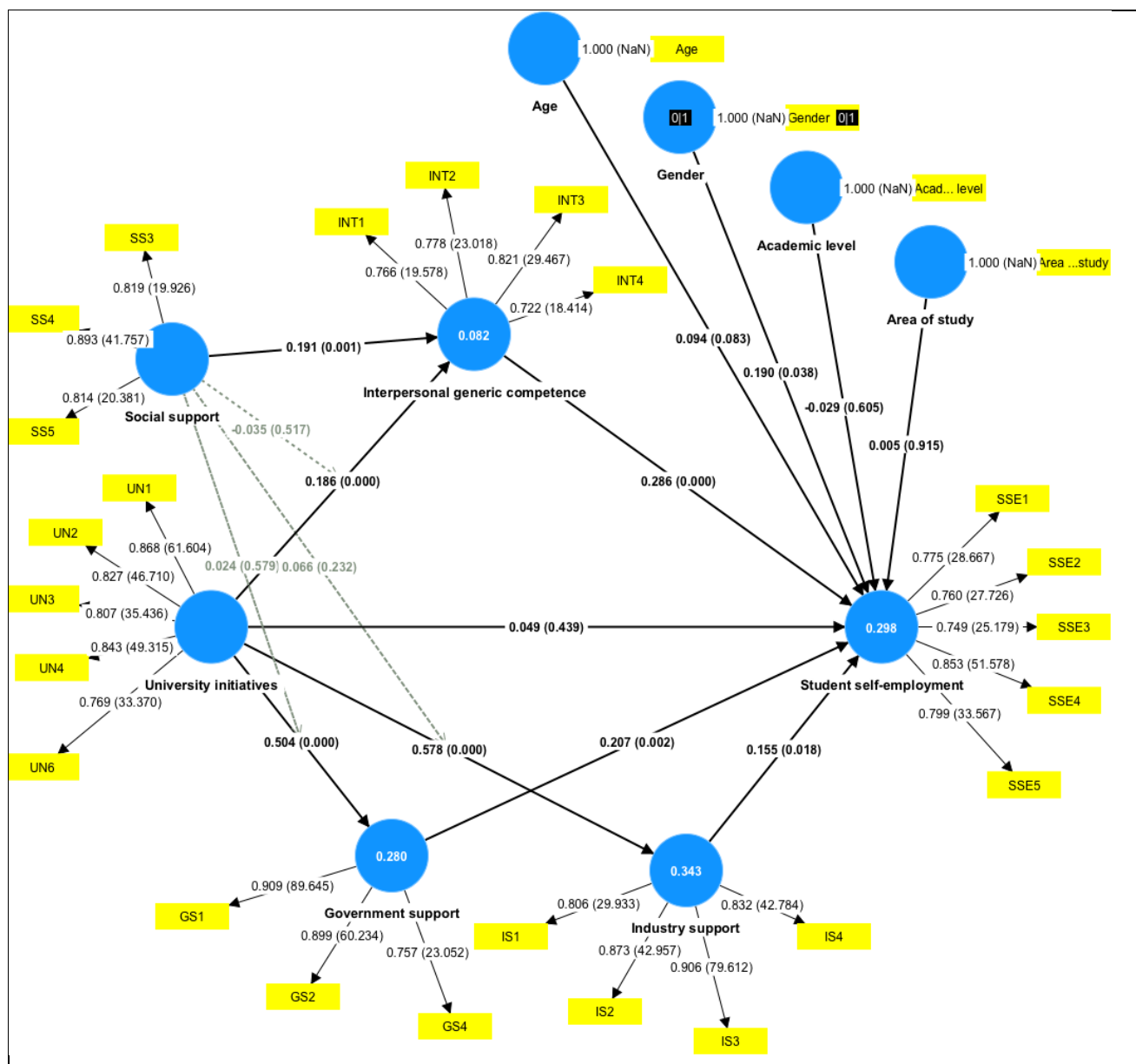


Figure 5.7 Structural model

Source: Bootstrapping results

It should also be noted that in Figure 5.6, the outer model is measured through FL and t values, while the inner model makes use of path coefficients and p values. The model shows the results of direct, mediation and moderation relationships. The effect of control variables was also tested as discussed in the next subsection.

5.6.1 Assessing the effect of control variables on student self-employment

This study considered the control variables, which include age, gender, academic level and area of study. These control variables were provided to investigate whether there were possible alternative explanations for student self-employment. This study found that age does not affect student self-

employment. This is signified by the bootstrapping results ($\beta = 0.094$; t value = 1.732; p - value = 0.083). This finding is in direct contrast to Zellweger et al. (2011) and Neneh (2020) who found that age is a determinant of entrepreneurship behaviour. The non-significant effect of age on student self-employment in this study may be explained by the point that the majority of study respondents were in similar age groups.

The findings in Table 5.7 show that gender has a positive statistically significant effect on student self-employment. This finding is justified by the bootstrapping results ($\beta = 0.190$; t value = 2.071; p value = 0.038). This study, therefore, supports the findings of Zellweger et al. (2011) and Ramadani et al. (2022) who found that gender plays a significant role in determining entrepreneurship behaviour. Zellweger et al. (2011) further alluded to the point that males were found to be more active in entrepreneurship than females. This study also found that academic level ($\beta = -0.029$; t value = 0.518; p value = 0.605) and area of study ($\beta = 0.004$; t value = 0.107; p value = 0.915) did not have an effect on self-employment. This finding opposes the finding of Shirokova et al. (2016) who found that education has a significant influence on student self-employment. Table 5.7 illustrates the effect of control variables on student self-employment.

Table 5.7 Effect of age, gender, academic level and area of study on student self-employment

Variables	β	t values	p values	Decision
Age has a positive effect on student self-employment.	0.094	1.732	0.083	Reject
Gender has a positive effect on student self-employment.	0.190	2.071	0.038	Accept
The academic level has a positive effect on student self-employment.	-0.029	0.518	0.605	Reject
Area of study has a positive effect on student self-employment.	0.004	0.107	0.915	Reject

Source: Bootstrapping results

5.6.2 Assessing direct effects

As shown in section 5.2, this study had two empirical research objectives that focused on measuring the direct effect of one construct on another. These research objectives were to measure the effect of university initiatives on student self-employment in South Africa, and to measure the effect of social support on entrepreneurial competence. They were also expressed through two hypotheses that were expressed as H1 and H8, respectively. Results in line with the research objectives and hypotheses are illustrated in Figure 5.6 and Table 5.8. These findings are also discussed in this section.

Table 5.8 Assessing direct relationships through structural equation modelling

Hypotheses	β	t statistics	p values	Decision
H1: University initiatives have a positive effect on student self-employment in South Africa	0.049	0.774	0.439	Reject
H8: Social support has a positive effect on entrepreneurial competence (interpersonal generic competence)	0.191	3.351	0.001	Accept

Source: Bootstrapping results

5.6.2.1 Assessing the effect of university initiatives on student self-employment

Hypothesis H1, formulated as *university initiatives have a positive effect on student self-employment in South Africa*, was rejected. The decision to reject H1 was based on SEM results ($\beta = 0.049$; t value = 0.774; p value = 0.439) shown in Figure 5.6 and Table 5.8. These results showed that university initiatives did not have a statistically significant positive effect on student self-employment. However, it should be noted that university initiatives only lose their effect on student self-employment when mediator constructs (interpersonal generic competence, industry support and government support) have been added to the model. Without the inclusion of these mediator constructs, university initiatives are found to have a statistically significant effect on student self-employment in this study ($\beta = 0.344$; t value = 7.771; p value = 0.000). It was important to report this context so that the boundary conditions in which this result was achieved are understood.

Previous studies found that university initiatives had a direct effect on student self-employment (Ramalu et al., 2010; Galeano et al., 2012; Fitzgerald et al., 2014; Saeed et al., 2015; Ranabahu et al., 2020; Liu et al., 2022). In their study, Ramalu et al. (2010) found that university initiatives such as the inclusion of business incubators and general entrepreneurship support led to student self-employment. Galeano et al. (2012), Fitzgerald et al. (2014) and Ranabahu et al. (2020) also found that university initiatives that included exposing students to innovative product and process development through internships, affected student self-employment. Saeed et al. (2015) found that university initiatives, such as the provision of entrepreneurship courses, workshops, and conferences, affected student self-employment. Liu et al. (2022) found that university initiatives, for example the provision of financial assistance and offering the campus as a marketplace to students, led to successful student self-employment. However, it should be realised that the aforementioned studies did not test the effect of university initiatives under a complex model involving mediators. The inclusion of mediators in this study nullified the positive effect of university initiatives on student self-employment. This study does not necessarily oppose the results of the previous studies (Ramalu et al., 2010; Galeano et al., 2012; Fitzgerald et al., 2014; Saeed et al., 2015; Ranabahu et al., 2020; Liu et al., 2022); instead, it

proffers an argument that university initiatives affect student self-employment only when mediators (i.e., entrepreneurial competence, industry support and government support) are not included. In other words, the positive effect of university initiatives on student self-employment only holds in a simple linear model. However, the positive effect of university initiatives on student self-employment is disrupted once boundary conditions (i.e., entrepreneurial competence, industry support and government support) are accounted for. This study, therefore, provides new insight in line with the understanding that university initiatives do not provide a positive direct effect on student self-employment in a complex student self-employment ecosystem model that accounts for entrepreneurial competence, industry support and government support.

5.6.2.2 Assessing the effect of social support on entrepreneurial competence

It should be noted that only interpersonal generic competence was tested as a measure of entrepreneurial competence in H8. Instrumental generic competence and systematic generic competence were not tested since they were removed from the measurement model after failing to satisfy the minimum required threshold for CA and CR (see section 5.5 and Table 5.3). Hypothesis H8, formulated as *social support has a positive effect on entrepreneurial competence (interpersonal generic competence)* is accepted at a $p < 0.001$ significant level. The decision to accept H8 was based on SEM results ($\beta = 0.191$; t value = 3.351; p value = 0.001), which showed that social support had a positive effect on interpersonal generic competence. This study, therefore, shows that social support has a statistically significant effect on entrepreneurial competence in the form of interpersonal generic competence. This finding supports previous studies, for example, Levesque (2014), Sahban et al. (2016), Son et al. (2018), Nowinski and Haddoud (2019) and Xia et al. (2020) who found that social support had a significant effect on entrepreneurial competence. A study carried out by Levesque (2014) found that social support such as financial assistance provided by friends and family resulted in entrepreneurial competence. Sahban et al. (2016) found that social support, for example, physical support, which involved helping with physical activities, had a positive effect on entrepreneurial competence. Son et al. (2018) also found that social support in the form of emotional support had a significant effect on entrepreneurial competence. However, the aforementioned previous studies generalised entrepreneurial competence. This is different from the current study that specified the exact form of entrepreneurial competence (i.e., interpersonal generic competence), which is related to social support.

5.6.3 Evaluating mediation effects

The third research objective of this study was to establish the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university

initiatives and student self-employment in South Africa. Bootstrapping with subsamples of 5 000 was applied to carry out mediation analysis in SmartPLS 4. The results of the analysis are shown in structural model 5.6 and Table 5.9 illustrated in this section. The discussion of these results is also carried out in this section, while taking into consideration the findings of previous similar studies. However, it should be noted that only interpersonal generic competence was applied to represent entrepreneurial competence. As already indicated in section 5.5, instrumental generic competence and systematic generic competence were removed from the measurement model due to their inability to meet the required threshold for CA and CR.

Table 5.9 Mediation analysis – Specific indirect effects

Hypotheses	β	t statistics	p values	Decision
H2: Entrepreneurial competence (interpersonal generic competence) has a positive mediation effect on the relationship between university initiatives and student self-employment	0.055	3.087	0.002	Accept
H3: Industry support mediates the relationship between university initiatives and student self-employment	0.095	2.489	0.013	Accept
H4: Government support mediates the relationship between university initiatives and student self-employment	0.110	3.188	0.001	Accept

Source: Bootstrapping results

5.6.3.1 Evaluating the mediation effect of entrepreneurial competence (interpersonal generic competence) on the relationship between university initiatives and student self-employment

Hypothesis H2, formulated as *entrepreneurial competence (interpersonal generic competence) has a positive mediation effect on the relationship between university initiatives and student self-employment* and is accepted at $p < 0.05$ significant level. The decision to accept H2 is based on specific indirect effect mediation analysis results ($\beta = 0.055$; t value = 3.087; p value = 0.002). These results show that interpersonal generic competence had full mediation on the relationship between university initiatives and student self-employment. The declaration that interpersonal generic competence had full mediation is made in line with the results in H1 that found that university initiatives did not have a statistically significant effect on student self-employment. Entrepreneurial competence through interpersonal generic competence fully influences the relationship between university initiatives and student self-employment. Thus, the effect of university initiatives on student self-employment passes through entrepreneurial competence in the form of interpersonal generic competence.

In line with the current study, the mediation effect of entrepreneurial competence in entrepreneurial studies is evident in previous studies (Minai et al., 2018; Asmawiyah et al., 2020; Khan et al., 2020; Kusumawijaya and Astuti, 2021; Aftab, Veneziani, Sarwar and Ishag, 2022). In their study, Minai et al. (2018) found that entrepreneurial competence mediates the relationship between entrepreneurial education and firm performance. However, Minai et al. (2018) did not mention the type of mediation that entrepreneurial competence provides on the relationship between entrepreneurial education and firm performance. Asmawiyah et al. (2020) found that entrepreneurial competence mediates the relationship between human capital and business performance. Similar to Minai et al. (2018), Asmawiyah et al. (2020) did not indicate the type of mediation that is played by entrepreneurial competence in the aforementioned relationship.

Studies carried out by Khan et al. (2020) and Gull et al. (2021) found that entrepreneurial competence mediated the relationship between entrepreneurial orientation and entrepreneurial performance. Kusumawijaya and Astuti (2021) also found that entrepreneurial competence played a mediation effect on the relationship between personality traits and entrepreneurial intentions. In their study, Aftab et al. (2022) found that entrepreneurial competence mediated the relationship between entrepreneurial orientation and firm performance. However, Khan et al. (2020), Gull et al. (2021), Kusumawijaya and Astuti (2021) and Aftab et al. (2022) did not illustrate whether entrepreneurial competence played a partial or full mediation. This study therefore provides better insight than previous studies in three ways. This study indicates that entrepreneurial competence provides full mediation on the relationship between university initiatives and student self-employment; it does not generalise entrepreneurial competence but clarifies it as interpersonal generic competence; and a thorough review of literature also showed that the current study is the first to investigate the mediation effect of entrepreneurial competence on the relationship between university initiatives and student self-employment.

5.6.3.2 Evaluating the mediation effect of industry support on the relationship between university initiatives and student self-employment

Hypothesis H3, formulated as *industry support mediates the relationship between university initiatives and student self-employment* is accepted at $p < 0.05$ significant level. The decision to accept H3 was based on specific indirect effects mediation analysis results ($\beta = 0.095$; t value = 2.489; p value = 0.013). These results showed that industry support had full mediation on the relationship between university initiatives and student self-employment. The full mediation, in this case, is supported by the results of H1 that showed a non-statistically significant relationship between university initiatives and student self-employment after the introduction of industry support. Thus, the effect of university initiatives

changes its path upon the introduction of industry support as shown in Figure 5.6. The mediation effect of industry support in entrepreneurial studies is evident in previous studies (Ficapal-Cusi et al. 2021; Wang et al. 2022). However, it should be acknowledged that studies tested the mediation effect of industry support. One of these studies is Ficapal-Cusi et al. (2021) who found that industry support plays a significant mediation effect on the relationship between green economic regulations and firm performance. Also, Wang et al. (2022) found that industry support plays a mediation effect on the relationship between environmental regulations and a firm's green economic efficiency.

An abundance of studies showed that industry support has a direct statistically significant effect on student self-employment (McKechnie et al., 2014; Ganguli and Matar, 2016; Awang and Hudin, 2017). Ganguli and Matar (2016) found that industry support through graduate training results in successful student self-employment. McKechnie et al. (2014) also found that government support through the provision of work-integrated learning results in student self-employment. In their study, Pardo-Garcia and Barac (2020) found that industry support contributes to improving student entrepreneurial skills which is important for successful student self-employment. Also, Samo and Huda (2019) found that industry support influences student self-employment. However, these previous studies did not provide insight into the mediation effect of industry support on the relationship between university initiatives and student self-employment. Gachie (2020) explained that industry support plays a significant role in the relationship between university initiatives and student self-employment. The triple helix model also emphasised the importance of industry support on the relationship between university initiatives and student self-employment (Etzkowitz, 1993; Etzkowitz and Dzisah, 2013). The current study confirms the aforementioned argument through its results that industry support plays a full mediation effect on the relationship between university initiatives and student self-employment.

5.6.3.3 Evaluating the mediation effect of government support on the relationship between university initiatives and student self-employment

Hypothesis H4, formulated as *government support mediates the relationship between university initiatives and student self-employment* is accepted at $p < 0.05$ significant level. The decision to accept H4 is based on specific indirect effect mediation analysis results ($\beta = 0.110$; t value = 3.188; p - p value = 0.001). Taking consideration of the results in Table 5.9 and a decision made on H1 based on Figure 5.6 and Table 5.8 (university initiatives not having a statistically significant effect on student self-employment), government support has full mediation on the relationship between university initiatives and student self-employment. This means that university initiatives affect student self-employment through government support in a complex student self-employment ecosystem model. The mediation effect of government support within entrepreneurial studies is supported by a few

previous studies (Al Hawaj and Barone, 2019; Hamdan et al., 2019; Peng and Walid, 2022). In their study, Hamdan et al. (2019) found that government support mediates the relationship between entrepreneurship and economic growth. Also, Peng and Walid (2022) found that government support mediates the relationship between entrepreneurs' perceived risk and sustainable entrepreneurship. However, it should be noted that the aforementioned studies did not investigate the mediation effect of government support on the relationship between university initiatives and student self-employment. Also, there is no indication in these previous studies of the type of mediation that government support gives in the investigated relationships. The current study, therefore, contributes by providing insight into the significance of government support as a boundary condition proving full mediation on the effect of university initiatives on student self-employment.

5.6.4 Assessing the moderated mediation effects

The fifth research objective was to investigate the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa. It should be noted that moderated mediation analysis that involves entrepreneurial competence involves only interpersonal generic competence. As already indicated, instrumental generic competence and systematic competence were removed from the measurement model due to failure to satisfy the threshold for CA and CR. The moderated mediation analysis was carried out in SmartPLS 4 through the bootstrapping procedure. Results of this procedure are illustrated in Figure 5.6 and Table 5.10, which shows the moderated mediation analysis and specifically indirect effects results.

Table 5.10 Moderated mediation analysis – Specific indirect effects results

Hypotheses	β	t statistics	p values	Decision
H5: Social support has a moderated mediation effect on the relationship between university initiatives and self-employment through entrepreneurial competence (interpersonal generic competence).	-0.010	0.631	0.528	Reject
H6: Social support has a moderated mediation effect on the relationship between university initiatives and self-employment through industry support.	0.011	0.963	0.335	Reject
H7: Social support has a moderated mediation effect on the relationship between university initiatives and self-employment through government support.	0.005	0.533	0.594	Reject

Source: Bootstrapping results

Hypothesis H5, formulated as *social support has a moderated mediation effect on the relationship between university initiatives and self-employment through entrepreneurial competence (interpersonal generic competence)*, was rejected. The decision to reject H5 was based on the moderation mediation analysis specific indirect effects results ($\beta = -0.010$; t value = 0.631; p value = 0.528). These results showed that social support did not have a statistically significant moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence in the interpersonal generic competence. Hypothesis H6, formulated as *social support has a moderated mediation effect on the relationship between university initiatives and self-employment through industry support*, was rejected. The decision to reject H6 was based on the moderated mediation-specific indirect effects results ($\beta = 0.011$; t value = 0.963; p value = 0.335). These results show that social support did not have a statistically significant moderated mediation effect on the relationship between university initiatives and self-employment through industry support. Hypothesis H7, formulated as *social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through government support*, was rejected. The decision to reject H7 was based on the moderated mediation analysis specific indirect effects results ($\beta = 0.005$; t value = 0.533; p value = 0.594). It should, therefore, be noted that social support did not have a statistically significant moderated mediation effect on the relationship between university initiatives and self-employment through government support.

The aforementioned results contradicted the findings in previous studies that have found social support to be a moderator in entrepreneurial studies (Son et al., 2018; Wang and Huang, 2019; Muhammed et al., 2020; Jadmiko, 2021; Neneh, 2022). Son et al. (2018) and Wang and Huang (2019) found that social support had a moderating effect on the relationship between entrepreneurial self-efficacy and entrepreneurial intentions. Muhammed et al. (2020) found that social support had a moderating effect on the relationship between entrepreneurial education and entrepreneurial intention. Jadmiko (2021) found that social support (i.e., moral support) had a moderating effect on the relationship between the attitude of becoming a social entrepreneur and social entrepreneurial intentions. Neneh (2022) found that social support had a moderate effect on the relationship between entrepreneurial passion and entrepreneurial intention through self-efficacy. The next section presents the summary of the current chapter.

5.7 Summary

In summary, it should be noted that students sampled in this study had low perceptions of university initiatives, industry support and government support towards student self-employment. However, students had moderate perceptions of entrepreneurial competence. Students also had low

perceptions of social support in the form of financial aid and assistance with business responsibilities. On the other hand, students indicated moderate perceptions of the assistance they receive when they are physically unwell, as well as advice from trustworthy friends and family members. This chapter has also shown that university initiatives did not have a statistically significant effect on student self-employment in a complex model involving entrepreneurial competence, industry support and government support as mediators. However, it should be noted that university initiatives had a statistically significant positive effect on student self-employment in a simple linear model that did not include mediators and moderators. Also, this chapter has shown that social support had a statistically significant positive effect on entrepreneurial competence. The chapter also showed that entrepreneurial competence in the form of interpersonal generic competence had a statistically significant positive full mediation effect on the relationship between university initiatives and student self-employment. Also shown in this chapter is that industry support and government support provided full mediation on the relationship between university initiatives and student self-employment. However, social support did not have a statistically significant moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa. These results informed the student self-employment ecosystem model presented in the next chapter.



Chapter 6

STUDENT SELF-EMPLOYMENT ECOSYSTEM MODEL

6.1 Chapter overview

The previous chapter presented data analysis and a discussion of the findings. This chapter presents the student self-employment ecosystem model. To present this model, this chapter is structured into five subsections, namely the role of institutions in the student self-employment ecosystem that includes university initiatives, industry support, government support, social support, and their contribution to the student self-employment ecosystem model. Also, presented in this chapter is the university entrepreneurship office and its organogram. In addition, the blueprint that should be followed in the implementation of the university entrepreneurship office is also presented.

6.2 Introduction

The development of the student self-employment ecosystem model was influenced by the findings of the research objectives. Thus, the primary, theoretical and empirical research objectives were instrumental in the formulation of the student self-employment ecosystem model. The primary research objective aimed at developing a multi-tiered student self-employment ecosystem model that functions on the basis of university initiatives, industry support, government support, social support and entrepreneurial competence in South Africa.

The theoretical research objectives were concerned with the review of literature on the triple helix model, human capital theory, social capital theory, and entrepreneurial action theory. The theoretical research objectives further aimed at reviewing the literature on university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment.

The first empirical research objective aimed at evaluating students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa. The second empirical research objective measured the effect of university initiatives on student self-employment in South Africa. The third empirical research objective measured the effect of social support on entrepreneurial competence. The fourth empirical research objective established the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment in South Africa. The fifth empirical research objective investigated the moderated

mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa.

The theoretical research objectives have been operationalised in Chapters 2 and 3, while the results on empirical research objectives were discussed in Chapter 5. Consequently, the operationalisation of the theoretical and empirical research objectives has led to the development of the student self-employment ecosystem model which was the primary research objective. The student self-employment ecosystem model is presented next.

6.3 Student self-employment ecosystem model

The student self-employment ecosystem model functions on the cooperation of universities, government, industry, and society. The model also includes entrepreneurial competence and gender as important facets within a successful student self-employment ecosystem. Thus, all the components of the ecosystem play a significant role in influencing successful student self-employment. Figure 6.1 presents the student self-employment ecosystem model.

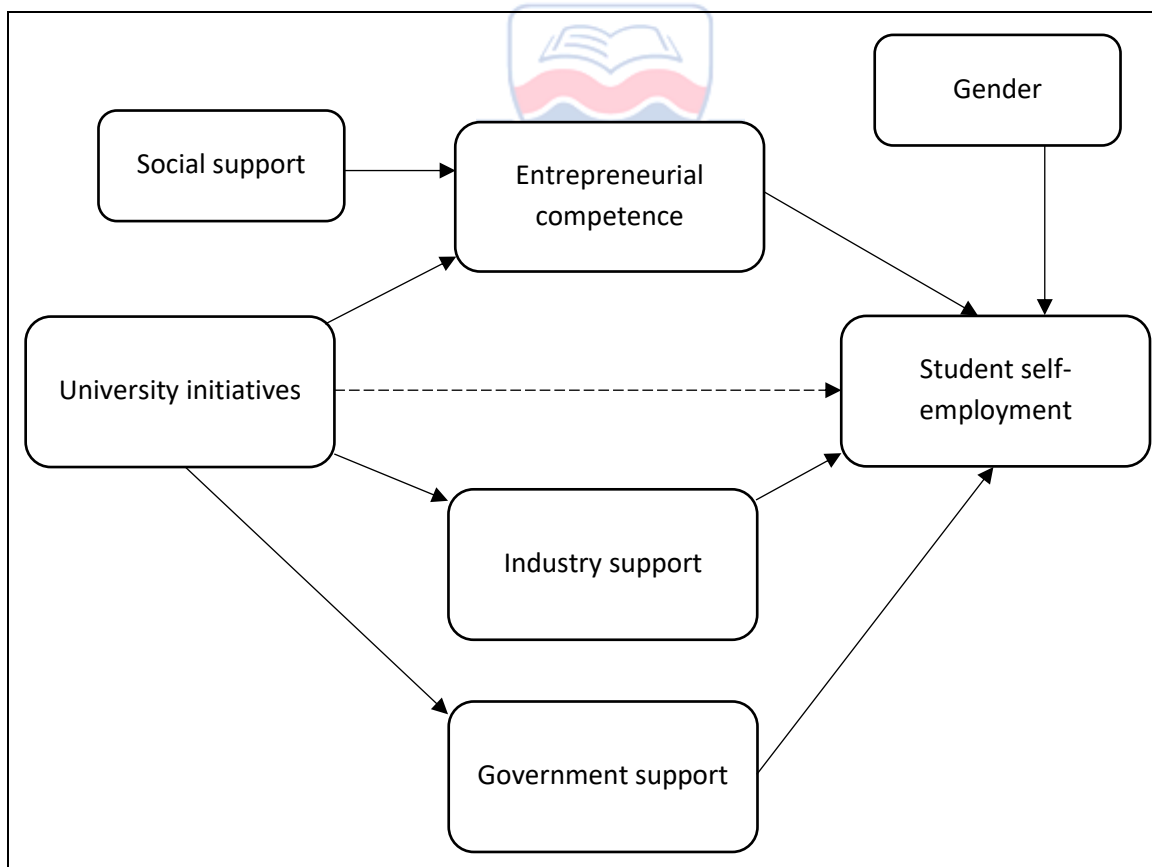


Figure 6.1 Student self-employment ecosystem

Source: Author's own construction

As already indicated, the student self-employment ecosystem model shows a multi-tiered interaction of different stakeholders leading to successful student self-employment. In this model, representation comes from the society, institutions, and individual levels. Society is represented by social support which is interpreted as support towards student self-employment from family and friends. The institutions are represented by universities, industry, and government. This representation is supported by the triple helix model as discussed in Chapter 3 of this study. The individual level refers to the student's entrepreneurial competence and gender. The next section presents the role of institutions in the student self-employment ecosystem.

6.3.1 Role of institutions in the student self-employment ecosystem

In the comprehensive multi-tiered student self-employment ecosystem model, institutions play a significant role. These institutions refer to universities, industry and the government as indicated in Figure 6.1. An agreement needs to be reached that clarifies the cooperation towards the development of student self-employment needs. In this agreement, the role of each institution involved should be made clear. The next section presents the commitment of universities to the student self-employment ecosystem model.

6.3.1.1 University commitment to the student self-employment ecosystem

Universities are the custodians of students, and this makes their role in the student self-employment ecosystem model important. Consequently, the influence of universities towards student self-employment needs to be infused from the moment a student becomes enrolled. The university should contribute by ensuring coaching, mentorship, and provision of entrepreneurship workshops to students. Also, of great significance is the contribution that universities should provide through making students aware of entrepreneurship as a career choice. In addition, universities need to motivate and influence students to be creative in formulating business ideas. While these different initiatives are fundamental towards student self-employment, of equal importance is how the university will ensure that its commitment comes to reality. Figure 5.2 provides a process map that should be followed by universities in stimulating student self-employment.

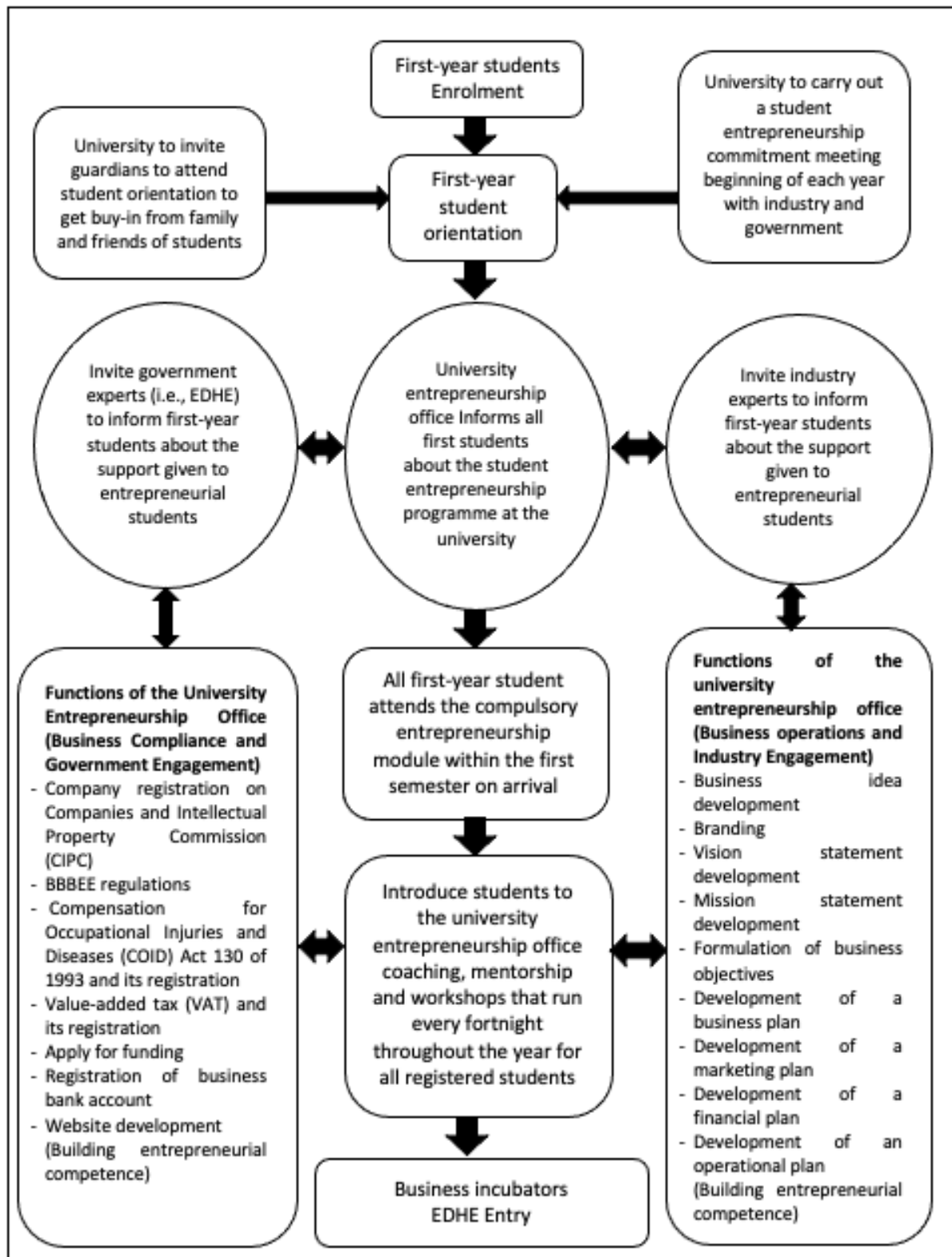


Figure 6.2 University process in support of student self-employment

Source: Author's own construction

The university should spearhead the student self-employment ecosystem model in collaboration with the industry and government. It is the mandate of the university to ensure that all students are

introduced to entrepreneurship from as early as enrolment days. The university should, therefore, have a full-fledged entrepreneurship office responsible for facilitating the student entrepreneurship agenda. The entrepreneurship office should be well resourced to allow it to carry out its mandate effectively. Consequently, a director should be appointed to focus on ensuring the effective and efficient functioning of the entrepreneurship office. Apart from the director, there could be other managerial positions, for example, the assistant director, senior officer for business compliance and senior officer for business operations. Figure 5.3 illustrates the organogram in the entrepreneurship office.

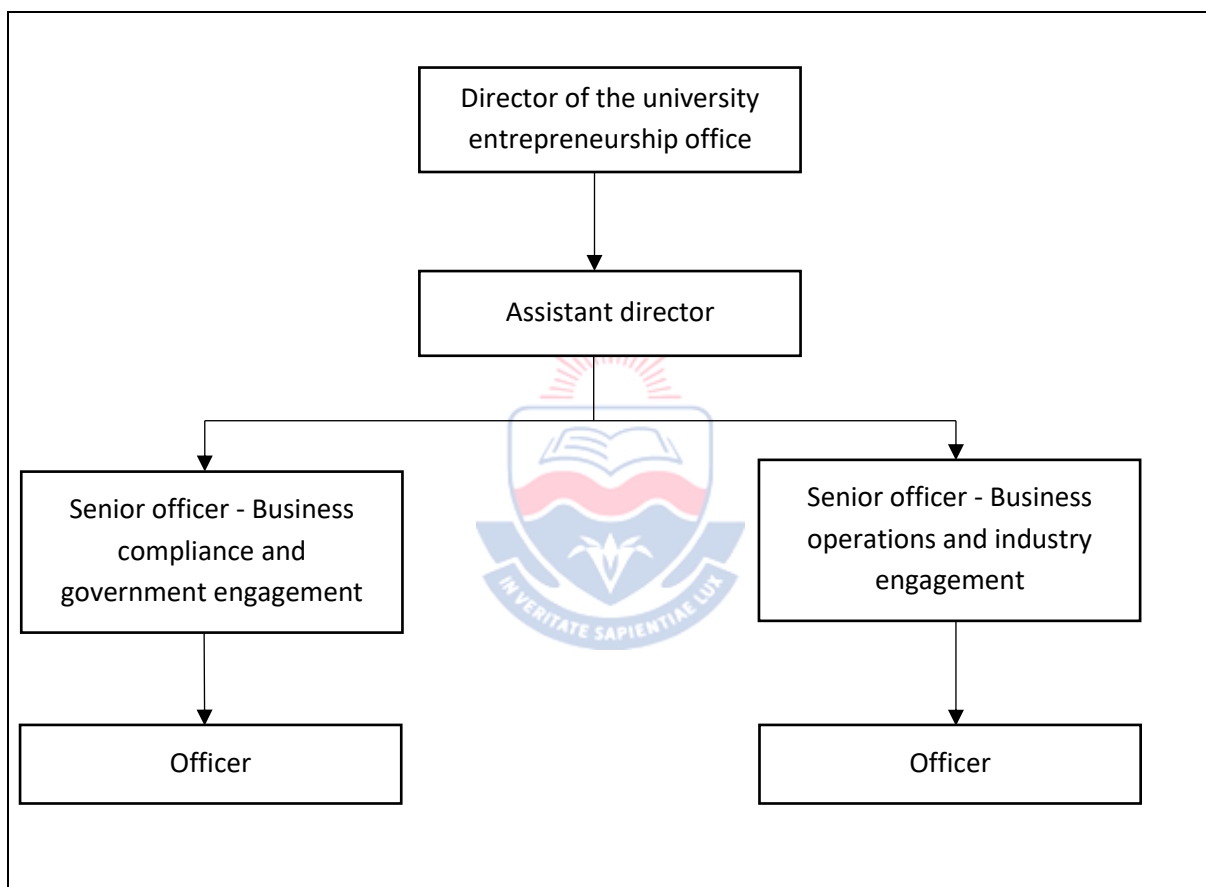


Figure 6.3 *Organogram of the university entrepreneurship office*

Source: Author's own construction

At the bottom of the university entrepreneurship office, there will be officers reporting to senior officers for business compliance and business operations. These officers are responsible for arranging workshops within their designated areas. As indicated in Figure 6.2, the entrepreneurship office should carry out business workshops, mentorship and coaching every fortnight. Thus, the workshops, mentorship and coaching should focus on business compliance and topics on business operations. It was also shown in Figure 5.2 and Figure 5.3 that the industry and government are responsible for

business operations and business compliance, respectively. The next section takes the industry support into perspective.

6.3.1.2 Industry support towards student self-employment

At the beginning of each year, the industry must pledge its commitment towards student self-employment. Such commitment should be expressed during the student entrepreneurship commitment meeting as shown in Figure 6.2. It is in this meeting that there should be an agreement on the support that is expected from the industry towards student self-employment. Representatives from the industry should present business workshops, mentorship, coaching and motivation to all the students. However, there has to be a framework to follow to address critical themes that influence student self-employment. At least nine themes should be addressed by industry experts to influence student self-employment. These themes include the development of a business idea, branding a business, vision statement, mission statement, and formulation of business objectives. Also, important to be addressed by the industry experts include the provision of guidance on the formulation of business plans, marketing plans, financial plans and operational plans.

Fundamentally, the industry assists in stimulating the creative and innovative minds of students in the workshops arranged by the senior officers and officers of business operations and industry engagement. Experienced industry experts should encourage students to come up with novel business ideas. This can be achieved through encouraging discussions and brainstorming among students during the entrepreneurship workshops. Creating a name for the business venture is also important. It is also important for industry experts to take students through the process of creating a brand for their business. Industry experts who are knowledgeable about branding need to run this workshop. Consequently, students need to be guided on the different types of brand names and the procedure that is taken to come up with a successful brand. At this stage, students should be taught how to come up with a product and corporate brand.

Another important aspect that should be handled by the industry is the vision statement. Students must be taught the importance of a vision statement. The industry should use its expertise to guide students in the formulation of realistic vision statements. The vision statement needs to be such that it is captivating and inspires the venture towards greatness. It is also important to introduce students to the concept of mission statement. Thus, the industry needs to guide students on the formulation of a mission statement. The mission statement should be such that it is relevant to the operations of the venture. Furthermore, students should be guided on the process to develop business objectives. Students should be taught that business objectives need to be specific, measurable, attainable, realistic and time-bound (SMART). Also, important to teach students will be the formulation of the

business plan, marketing plan, financial plan and operational plan. Table 6.1 shows the programme that should be followed by the industry through an academic year at a typical university. The next section presents government support towards student self-employment.

6.3.1.3 Government support towards student self-employment

The government experts need to work closely with the entrepreneurship office division for business compliance and government engagement. This cooperation should stem from the student entrepreneurship commitment meeting as shown in Figure 6.2. In this meeting, a cooperation agreement should be reached between the university, industry and government regarding the support to be provided by government. This meeting should provide clarity on the support that should come from the government experts; however, government experts need to be guided by the framework in Figure 6.2, which shows that the government should focus on providing business compliance guidance to students. This guidance should focus on government policies and programmes that support student self-employment endeavours. Consequently, students need to be taught how to register a company at Companies and Intellectual Property Commission (CIPC), and how to comply with Broad-Based Black Economic Empowerment (B-BBEE) regulations and the Compensation for Occupational Injuries and Diseases (COID) Act 130 of 1993. Also, very important in the workshops to be carried out by the government is the registration of value-added tax (VAT) and the ability to apply for government funding. These are the requirements that determine general business compliance within the South African environment. However, it should be noted that the requirements of business compliance are not limited to the aforementioned list.

The government experts, in coordination with the officers for business compliance and government engagement, must concentrate on educating students on the importance of company registration. Moreover, the government should also show students the procedures to be taken in the company registration process. This should include providing students with the website details for CIPC and showing the process for the registration of the company.

Of great significance to teach students is also the process of acquiring B-BBEE status. This is one of the most important regulations for achieving compliance in South Africa. Students need to be made aware that B-BBEE does not only mean having a black South African business partner in the business but also proof of good business operations. Proof of business operations include a commitment to provide skills training to employees and good financial record keeping. Also, another requirement for compliance is the COID. This is a requirement for every industry that students may want to trade in. Hence, students must be provided with sufficient knowledge of the procedure to register for this requirement. The registration of VAT is also important for every venture if it is to be taken seriously

by trading partners. Therefore, students need to be taught how to register for VAT and other tax requirements. Also, of great significance is providing students with the knowledge to remain compliant once such registrations have been achieved. As part of compliance, students should also be advised of the importance of opening a bank account. Apart from opening a bank account, it is also important to give students direction on how to source funding. The next section presents the role of social support.

6.3.1.4 Social support towards student self-employment

The importance of social support should not be undermined in the development of the student self-employment ecosystem. It is, therefore, important for the university to invite student guardians during student orientation. Guardians such as family and friends should attend so that they understand the commitment of the university, industry, and government towards the development of student entrepreneurship. Family and friends must be informed of the importance of supporting students towards entrepreneurship. The type of support that family and friends should give to students should be specified during the orientation, such as financial assistance, emotional support, business ideas and any other form of support required in entrepreneurship. The next section presents a suggested programme to run the university entrepreneurship office.

6.3.2 University entrepreneurship office programme

The previous sections have presented the role that should be played by universities, industry, government, and society. This section aims at providing a suggested blueprint that should be followed by the university entrepreneurship office. The university entrepreneurship office should have a programme through which the activities described in Figure 6.2 are implemented. These activities need to run throughout the year, while taking into consideration other academic programmes within the university. Provided in Table 6.1 is the description of activities and the timelines through which they should be completed.

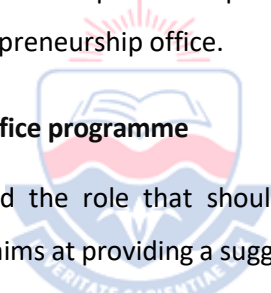


Table 6.1 Blueprint to run the university entrepreneurship office

Date	Activities	Responsible office	Venue
First semester			
February 20xx	Business idea development	Business operations and industry engagement	XXX
February 20xx	Branding		ZZZ
March 20xx	Vision statement development		RRR
March 20xx	Mission statement development		XXX
April 20xx	Formulation of business objectives		RRR
April 20xx	Development of a business plan		AAA
May 20xx	Development of marketing plan		EEE
May 20xx	Development of a financial plan		TTT
May 20xx	Development of an operational plan		EEE
Second semester			
July 20xx	Company registration on Companies and Intellectual Property Commission (CIPC)	Business compliance and government engagement	XXX
July 20xx	Broad-Based Black Economic Empowerment (B-BBEE) regulations		ZZZ
August 20xx	Compensation for Occupational Injuries and diseases (COID) Act 130 of 1993 and its registration		RRR
August 20xx	Value-added tax (VAT) and its registration		XXX
September 20xx	Application for funding		RRR
September 20xx	Registration of business bank account		TTT
September 20xx	Website development		EEE

Source: Researcher's own construction

6.4 Summary

This chapter has presented the student self-employment ecosystem model. It has been highlighted that the development of the multi-tiered student self-employment ecosystem model was the primary research objective of this study. Figures 6.1, 6.2, 6.3 and Table 6.1 show the structure of the student self-employment ecosystem model. In this structure, the role of the university in bringing the different stakeholders together, is specified. These stakeholders are identified as the students, guardians (family and friends), industry and government. The role that should be played by each of these stakeholders is also discussed in the subsequent sections of this chapter. Also, of great significance presented in this chapter is the blueprint that should be followed by the university entrepreneurship office to implement its mandate towards the development of student self-employment. The final chapter next presents the research conclusion and recommendations.

Chapter 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Chapter overview

The previous chapter has presented the developed student self-employment ecosystem model in line with the primary research objective. This chapter is mainly concerned with providing conclusions and recommendations. However, the chapter also presents other fundamental aspects, namely a summary of the findings, contribution to the body of knowledge, implications for theory and implications for practice. Also presented in this chapter are the limitations of the study, the direction for future research and a summary of the chapter. The next section presents the introduction that serves as a reminder of the research objectives and research hypotheses.

7.2 Introduction

By now the reader might have begun to regard the continuous repetition of research objectives in each chapter as somehow redundant. However, this approach has been helpful to keep the audience in the loop and constantly reminded of the research objectives. In support of this assertion, this study had as its theoretical research objectives to review of literature on the triple helix model, human capital theory, social capital theory, and entrepreneurial action theory. Also part of the theoretical research objectives included the review of literature on university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment. Theoretical research objectives have been operationalised in Chapter 2 and 3 of the study. This study also had five empirical research objectives that aimed at:

1. evaluating students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa;
2. measuring the effect of university initiatives on student self-employment in South Africa;
3. measuring the effect of social support on entrepreneurial competence;
4. establishing the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment in South Africa; and

5. investigating the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa.

In line with the empirical research objectives, this study had five research questions:

1. What are students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa?
2. Do university initiatives positively affect student self-employment in South Africa?
3. Does social support positively affect entrepreneurial competence?
4. Do entrepreneurial competence, industry support and government support mediate the relationship between university initiatives and student self-employment in South Africa?
5. Does social support play a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa?

7.3 Conclusions on research objectives and research questions

This section presents the conclusions on research objectives and the research questions as stipulated in the introduction section. The conclusions on research objectives and research questions provide support and a contribution to the body of knowledge, implications for theory and implications for practice. The next subsections present the conclusions on the theoretical and empirical research objectives.

7.3.1 Conclusion on the review of the literature on the triple helix model, human capital theory, social capital theory and entrepreneurial action theory, university initiatives, entrepreneurial competence industry support, government support and social support towards student self-employment

This study reviewed the literature on theories that include the triple helix model, entrepreneurial action theory, human capital theory, and social capital theory in Chapter 3. The study also reviewed literature on key concepts of the study, which included university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment. It is concluded that the triple helix model, human capital theory, social capital theory and entrepreneurial action theory sufficiently grounded the concepts of the study, which included university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment, respectively. Justification on the application of these

theories was sufficiently presented in Chapter 3. However, this study also provided a balanced view through the review of the criticism labelled against these theories. The next subsection present conclusions on the empirical research objectives.

7.3.2 Conclusion on students' perceptions of university initiatives, entrepreneurial competence, industry support, government support and social support towards student self-employment in South Africa

This study concludes that students had low perceptions of university initiatives towards student self-employment. This conclusion is supported by a low mean value of university initiatives at 2.55. The conclusion is also supported by students' low perceptions of all items representing university initiatives. Consequently, it is concluded that students did not know of any university initiatives that included entrepreneurship coaching, mentorship and workshops. Also, students did not know of any university initiative to make them aware of entrepreneurship as a career choice. Furthermore, it is concluded that students did not know of any university initiative to give business ideas and motivate students into entrepreneurship.

This study also concludes that students had moderate positive perceptions towards their entrepreneurial competence. This conclusion is supported by the mean values of instrumental generic competence, interpersonal generic competence and systematic generic competence, which were 3.72, 3.73 and 3.80, respectively. This study, therefore, conclude that students had moderate positive perceptions of their decision-making skills, ability to manage time, find new information and interpret information. It is also concluded that students had moderate positive perceptions of their human relations skills, networking skills, interpersonal skills and commitment skills. It is furthermore concluded that students had moderate positive perceptions of their innovative skills, risk-taking skills, flexibility to change and self-confidence.

The study furthermore concludes that students had low perceptions of industry support towards student self-employment. This conclusion is based on the low mean value of 2.02 on industry support. Also, it is concluded that the industry did not provide students with business mentorship, coaching and motivation to stimulate student self-employment. It is also concluded that students had low perceptions of government support towards student self-employment. This conclusion is based on the low mean value of 2.10 towards government support. It is further concluded that students had low perceptions of government support in terms of the provision of information regarding policies supporting student entrepreneurship. It is also concluded that the government did not provide students with sufficient information regarding programmes that support student self-employment. In addition, it is concluded that the government did not provide sufficient information in terms of how

students can access financial assistance. The government also did not provide support in the form of business training, for example, company registration, B-BBEE and COID.

This study concludes that students had moderate positive perceptions of social support towards student self-employment. This conclusion is evidenced by the mean value of 3.41 obtained on social support. It is concluded that students had family and friends who could help when they felt physically unwell. Family and friends could offer advice and suggestions when they needed help. In addition, it is concluded that students had family and friends they could trust. However, it is also concluded that the students had no have family and friends who could offer financial assistance and help with business responsibilities.

The current study concludes that students had low perceptions of student self-employment. This conclusion is supported by a mean value of 2.87 achieved on student self-employment. It is, therefore, concluded that students had low perceptions of their understanding of writing a business plan, application for business funding and skills to run a business. At the same time, it is concluded that students had moderate positive perceptions of their business ideas and skills to get the information required to run a business. The next section presents the conclusion on the effect of university initiatives on student self-employment.

7.3.3 Conclusion on the effect of university initiatives on student self-employment in South Africa

The study concludes that university initiatives did not affect student self-employment when mediators (interpersonal generic competence, industry support and government support) were included. This conclusion is substantiated by the bootstrapping results ($\beta = 0.049$; t value = 0.774; p value = 0.439). However, it cannot be ignored that university initiatives had a significant positive effect on student self-employment when tested without mediators ($\beta = 0.344$; t value = 7.771; p value = 0.000).

7.3.4 Conclusion on the effect of social support on entrepreneurial competence

The current study concludes that social support had an effect towards entrepreneurial competence in the form of interpersonal generic competence. This conclusion is reached following the bootstrapping results ($\beta = 0.191$; t value = 3.351; p value = 0.001). Based on these results, it is concluded that social support had a positive effect on entrepreneurial competence (interpersonal generic competence).

7.3.5 Conclusion on the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment in South Africa

This study concludes that entrepreneurial competence in the form of interpersonal generic competence had a mediation effect on the relationship between university initiatives and student self-employment. This conclusion is based on mediation results (specific indirect effects) of bootstrapping ($\beta = 0.055$; t value = 3.087; p value = 0.002). It should also be noted that upon the inclusion of entrepreneurial competence in the model, the effect of university initiatives on student self-employment was eliminated, which signifies the presence of full mediation. Based on these results, it is concluded that entrepreneurial competence in the form of interpersonal generic competence fully mediates the relationship between university initiatives and student self-employment.

The current study also concludes that industry support has a mediation effect on the relationship between university initiatives and student self-employment. This conclusion is based on the bootstrapping results through specific indirect effects ($\beta = 0.095$; t value = 2.489; p value = 0.013). It should also be noted that the introduction of industry support in the model nullified the direct effect of university initiatives on student self-employment. Based on this finding, it can be concluded that industry support fully mediates the relationship between university initiatives and student self-employment.

This study concludes that government support has a mediation effect on the relationship between university initiatives and student self-employment. This conclusion is based on the bootstrapping results through specific indirect effects ($\beta = 0.110$; t value = 3.188; p value = 0.001). It should be noted that the introduction of government support in the model invalidated the relationship between university initiatives and student self-employment giving evidence of the presence of full mediation. Therefore, it is concluded that government support has a full mediation effect on the relationship between university initiatives and student self-employment.

7.3.6 Conclusion on the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa

This study concludes that social support does not have a moderated mediation effect on the relationship between university initiatives and student self-employment. This conclusion is made based on the moderated mediation bootstrapping results ($\beta = -0.010$; t value = 0.631; p - p value = 0.528). Based on these results it can be concluded that social support does not have a moderated mediation effect on the relationship between university initiatives and student self-employment. It is

also concluded that social support does not have a moderated mediation effect on the relationship between university initiatives and student self-employment through industry support. This conclusion is made based on the bootstrapping moderated mediation results ($\beta = 0.011$; t value = 0.963; p - p value = 0.335). Based on these results, it is concluded that social support does not have a moderated mediation effect on the relationship between university initiatives and student self-employment through industry support. Also, this study concludes that social support does not have a moderated mediation effect on the relationship between university initiatives and self-employment through government support. This conclusion is based on the bootstrapping results ($\beta = 0.005$; t value = 0.533; p value = 0.594).

7.4 Summary of the major findings and conclusions on research hypotheses

This study found that students had low perceptions of university initiatives, industry support, government support and student self-employment. However, it was found that students also had moderate positive perceptions of their entrepreneurial competence (i.e., instrumental generic competence, interpersonal generic competence and systematic generic competence) and social support. It was also found that university initiatives did not affect student self-employment when mediators (interpersonal generic competence, industry support and government support) were incorporated. However, the effect of university initiatives on student self-employment was only realised in the absence of mediators. This study also found that social support had a positive effect on entrepreneurial competence. It was further found that entrepreneurial competence, industry support and government support had a full mediation effect on the relationship between university initiatives and student self-employment in South Africa. It was also found that social support did not have a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa. The next section presents conclusions on research hypotheses.

Table 7.1 Conclusions on research hypotheses

Hypotheses	β	t statistics	p values	Decision
H1: University initiatives have a positive effect on student self-employment in South Africa	0.049	0.774	0.439	Reject
H8: Social support has a positive effect on entrepreneurial competence (interpersonal generic competence)	0.191	3.351	0.001	Accept

Hypotheses	β	t statistics	p values	Decision
H2: Entrepreneurial competence (interpersonal generic competence) has a positive mediation effect on the relationship between university initiatives and student self-employment	0.055	3.087	0.002	Accept
H3: Industry support mediates the relationship between university initiatives and student self-employment	0.095	2.489	0.013	Accept
H4: Government support mediates the relationship between university initiatives and student self-employment	0.110	3.188	0.001	Accept
H5: Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence (interpersonal generic competence)	-0.010	0.631	0.528	Reject
H6: Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through industry support	0.011	0.963	0.335	Reject
H7: Social support has a moderated mediation effect on the relationship between university initiatives and student self-employment through government support.	0.005	0.533	0.594	Reject

7.5 Contribution of the study

The first theoretical contribution involved the development of a comprehensive framework for explaining self-employment founded on the interaction of the triple helix-model players (i.e., university initiatives, industry support and government support), entrepreneurial competence and social support to influence student self-employment. This framework is a direct response to the growing concern that despite previous attempts to develop theoretical approaches for student self-employment (Feola et al., 2019; Su et al., 2021), multi-tiered perspectives on student self-employment development that incorporates the triple helix model (i.e., university initiatives, industry support, government support), entrepreneurial competence and social support are yet to be developed (Saeed et al., 2015; Nandonde and Makaki, 2020). The current study contributes towards developing a comprehensive multi-tiered student self-employment framework that functions based on institutional (i.e., university initiatives, industry support, government support), societal (i.e., social support) and individual (i.e., entrepreneurial competence) perspectives. Research on the triple helix model,

entrepreneurial competence, and social support towards student self-employment is also currently fragmented. Existing studies are fragmented and limited only to understand the relationship between university entrepreneurial education and a positive entrepreneurial environment (Awang and Hudin, 2017; Oluseye et al., 2017); the relationship between government support, industry support and student entrepreneurial intentions (Samo and Ul Huda, 2019); mediation effect of industry support on the relationship between green economic regulations and entrepreneurial performance (Ficapal-Cusi et al., 2021; Wang et al., 2022); and mediation effect of government support on the relationship between entrepreneurship, economic growth, entrepreneurial perceived risk and sustainable entrepreneurship (Hamdan et al., 2019; Peng and Walid, 2022). This fragmentation prohibits researchers from having a holistic understanding of essential factors influencing student self-employment. This study comprehensively included fundamental factors that influence student self-employment such as the triple helix model (university initiatives, government support, industry support), entrepreneurial competence and social support. The inclusion of the triple helix model was based on the need to assess the invaluable contribution of the key stakeholders (universities, industry and government) towards student self-employment. This study also provided insight into understanding the direct and indirect effects of government support, industry support and entrepreneurial competence on the relationship between university initiatives and student self-employment. Also of great significance in this study was the need to understand the direct and indirect effect of social support on the relationship between university initiatives and student self-employment.

The second theoretical contribution included the integration of theories that inform the student self-employment ecosystem at different levels. This recognises the triple helix model (university initiatives, industry support and government support), human capital theory (entrepreneurial competence), social capital theory (social support) and entrepreneurial action theory as a comprehensive theoretical grounding for a successful student self-employment ecosystem. Therefore, rather than relying on one theory, the inclusion of the triple helix model, human capital theory, social capital theory and entrepreneurial action theory provided a comprehensive lens for understanding the student self-employment ecosystem. This calls for the need for researchers to consider integrating theories that address the need for university initiatives, industry support, government support, entrepreneurial competence, and social support to achieve a successful student self-employment ecosystem.

The practical contribution stems from the provision of understanding of entrepreneurial competence, university initiatives, government support, industry support and social support required to obtain a successful student self-employment ecosystem. Such understanding leads to recommendations required by policymakers to develop a successful student self-employment ecosystem. An

achievement of a successful student self-employment ecosystem will lead to the creation of jobs, a decrease in unemployment, a rise in income, an increase in the standard of living and poverty reduction.

7.6 Implications for theory

This study implied that university initiatives do not have a direct effect on student self-employment in the presence of mediators such as entrepreneurial competence, industry support and government support. However, in the absence of these mediators, university initiatives have a direct effect on student self-employment. Previous studies, for example, Ramalu et al. (2010), Galeano et al. (2012), Fitzgerald et al. (2014), Saeed et al. (2015), Ranabhu et al. (2020) and Liu et al. (2022) found that university initiatives influenced student entrepreneurship. Ramulu et al. (2010) found that university initiatives (business incubators and general entrepreneurship support) contributed to successful student entrepreneurship. Galeano et al. (2012), Fitzgerald et al. (2014) and Ranabhu et al. (2020) found that university initiatives such as exposing students to innovative products and process ideas resulted in student self-employment. Saeed et al. (2015) found that university initiatives that include the provision of entrepreneurship courses, workshops and conferences resulted in student self-employment. However, the aforementioned studies are limited in the sense that they did not provide further insight regarding the implications of adding mediators to the relationship between university initiatives and student self-employment. Such insight was provided in the current study, which showed that the addition of mediators (entrepreneurial competence, industry support and government support) nullified the direct effect of university initiatives on student self-employment.

This study also implied that social support from family and friends (financial assistance, advice, and physical help) had a positive effect on entrepreneurial competence. This theoretical implication is supported by previous studies, for example Levesque (2014), Sahban et al. (2016), Son et al. (2018), Nowinski and Haddoud (2019) and Xia et al. (2020). These studies found that social support had a positive effect on entrepreneurial competence. However, these studies did not clarify the type of entrepreneurial competence related to social support. This weakness was addressed in the current study, which implied that social support had an effect on entrepreneurial competence in the form of interpersonal competence.

This study implied that entrepreneurial competence in the form of interpersonal generic competence had a positive full mediation effect on the relationship between university initiatives and student self-employment. The mediation effect of entrepreneurial competence within entrepreneurial studies was observed in previous studies such as Minai et al. (2018), Asmawiyah et al. (2020), Khan et al. (2020), Kusumawijaya and Astuti (2021) and Aftab et al. (2022). Minai et al. (2018) found that entrepreneurial

competence mediated the relationship between entrepreneurial education and firm performance. Asmawiyah et al. (2020) found that entrepreneurial competence mediated the relationship between human capital and business performance. However, the current study went a step ahead of the aforementioned studies by implying that entrepreneurial competence in the form of interpersonal competence fully mediated the relationship between university initiatives and student self-employment.

The current study implied that industry support fully mediates the relationship between university initiatives and student self-employment. The mediation effect of industry support was evident in previous entrepreneurial studies, for example, Ficapal-Cusi et al. (2021) and Wang et al. (2022). Ficapal-Cusi et al. (2021) found that industry support had a mediation effect on the relationship between green economic regulations and firm performance. Wang et al. (2022) found that industry support had a mediation effect on the relationship between environmental regulations and the firm's green economic efficiency. However, these studies did not provide insight into the extent of mediation that is provided by industry support. Such insight was provided by the current study and implied that industry support had a full mediation effect on the relationship between university initiatives and student self-employment.

This study implied that government support had a full mediation effect on the relationship between university initiatives and student self-employment. The mediation effect of government support within entrepreneurial studies such as Al Hawaj and Barone (2019), Hamdan et al. (2019) and Peng and Walid (2022) was confirmed. Hamdan et al. (2019) found that government support mediated the relationship between entrepreneurship and economic growth. Peng and Walid (2022) found that government support mediated the relationship between entrepreneurs' perceived risk and sustainable entrepreneurship. However, these studies did not indicate the type of mediation that is provided by government support. To address this shortcoming, the current study implied that government support had a full mediation effect on the relationship between university initiatives and student self-employment.

This study also implied that social support did not have a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support. This implication opposed the findings in previous studies that social support had a moderation effect within entrepreneurial studies (Son et al., 2018; Wang and Huang, 2019; Muhammed et al., 2020; Jadmiko, 2021; Neneh, 2022). In their studies, Son et al. (2018) and Wang and Huang (2019) found that social support had a moderation effect on the relationship between entrepreneurial self-efficacy and entrepreneurial intentions. Muhammed

et al. (2020) found that social support had a moderation effect on the relationship between entrepreneurial education and entrepreneurial intention. Jadmiko (2021) found that social support had a moderation effect on the relationship between attitude and social entrepreneurial intentions. Neneh (2022) found that social support moderated the relationship between entrepreneurial passion and entrepreneurial intention through self-efficacy. The next section presents implications for practice.

7.7 Implications for practice

This study concluded that students had low perceptions of university initiatives, industry support and government support. Students' perceptions of entrepreneurial competence and social support towards student self-employment were only moderate. This study also concluded that university initiatives, entrepreneurial competence, industry support, government support and social support are all essential in influencing successful student self-employment. Based on this background, implications for practice are provided in the following subsections, in line with the student self-employment ecosystem suggested in Chapter 6.

7.7.1 University should carry out a student entrepreneurship commitment meeting with industry and government partners

The university should facilitate a meeting with the industry and government partners at the beginning of each year to discuss commitment to student self-employment. The university should, therefore, identify a list of committed industry and government partners. These partners should be invited to express their commitment to the student self-employment ecosystem model. The roles of each partner should be clarified during this meeting. The student self-employment ecosystem model in Chapter 6 (see Figure 6.2 and Table 6.1) should be used as a guide to the responsibilities of each partner. Thus, the industry should focus on business operations while the government concentrates on business compliance functions.

7.7.2 Introduce first-year students to the student self-employment ecosystem model during student orientation

The orientation period should be used to expose students to the student self-employment ecosystem model. It is, therefore, important to invite industry and government representatives to confirm their commitment and role during student orientation. It is during their orientation that the industry should share with students their responsibility within the student self-employment ecosystem model. The government should also provide detail regarding their role in the student self-employment ecosystem.

Students should be advised that it is mandatory to participate in the student self-employment programme.

7.7.3 Invite student guardians to attend the orientation on student self-employment

This study concluded that social support has a direct effect on entrepreneurial competence. It is based on this conclusion that guardians of students should be involved in the student self-employment ecosystem model from the onset. As a mechanism to involve family and friends of students, they should be invited. However, the system of *Respond, if you please* (RSVP) should be used for all guardians attending the special programme for student self-employment. This will help to plan a successful orientation programme in line with the capacity of the university.

7.7.4 Communicate progress on the student self-employment programme through a monthly newsletter

Apart from inviting guardians for orientation, it is also important that they are kept informed of the progress of the student self-employment ecosystem. This can be achieved by making use of a monthly newsletter that is only communicated to those who subscribe. The monthly newsletter needs to be generated from the university entrepreneurship office. Its purpose should be to inform not only guardians but also other stakeholders within the student self-employment ecosystem model, for example, the industry, government, and students.

7.7.5 Industry should commit to its business operations support in the student self-employment ecosystem model

Chapter 6 presented the support that the industry should provide in the student self-employment ecosystem model. It is, therefore, important that the industry commit to its role, which includes support on business idea development, branding, development of a vision and mission statement. Also, the industry needs to support students through support on the formulation of business objectives, development of a business plan, creation of a marketing plan, financial plan, and operational plan.

7.7.6 Government should provide business compliance support in the student self-employment ecosystem model

It is also important that the government provides business compliance support in the student self-employment ecosystem model. The government should, therefore, be guided by the model in Chapter 6 (see Figure 6.2). Consequently, the government should provide support by coaching students on how to register a company on CIPC, B-BBEE, COID, VAT, and open a business bank account.

These are important compliance requirements in every industry. Also, the government needs to support students in the mechanisms to apply for funding. This should be done to educate students on the processes that should be followed to access government funding. The government also needs to advise students on the importance of putting up a business website.

7.7.7 Include entrepreneurship in the academic curriculum

Entrepreneurship must be included in the academic curriculum of all the qualifications offered by the university. This can be achieved through the introduction of a compulsory entrepreneurship module for all first-year students within the first semester. The curriculum can be aligned with the blueprint of the university entrepreneurship office in Table 6.1. The content of the curriculum can include the theory of business operations and compliance to prepare students for the ecosystem model.

7.7.8 Establish the university entrepreneurship office

The university entrepreneurship office should be responsible for spearheading the student self-employment ecosystem model. The university entrepreneurship office should have a structure that includes a director, an assistant director, and two senior officers for business compliance and business operations. The senior officer for business compliance should also engage with the government partners, while the senior officer for business operations engages with the industry. Each of these two senior officers should be allocated at least one officer to assist with the day-to-day operations of the respective office. The next section presents the limitations of the study.

7.8 Limitations of the study

The limitations of this study were six-fold to include focus on only university students, limited to a South African geographical region, focus on public higher education institutions, focus on students participating in the EDHE programme, pure quantitative methodology, and cross-sectional methodology. It should be noted that this study only focused on university students to understand factors that influence student self-employment. Therefore, students from institutions that were not classified as universities such as technical and TVET colleges, were not included in this study. The focus of this study was within the South African geographical region, and this excluded other regions in the world, for example, other parts of Africa and the world. It should also be noted that this study focused on the public universities in South Africa and this approach meant that private higher education institutions were left out. Also, important to note is that the research targeted only university students participating in the EDHE programme. Consequently, students who were self-employed while not participating in the EDHE programme were not included in the research. Furthermore, this study was pursued through the use of pure quantitative methodology. A focus on the quantitative methodology

means that the advantages of qualitative methodology could not be incorporated in the study. This study, therefore, could not allow respondents to provide answers in their own words since all questions were closed-ended. Because only a quantitative research methodology was used, the study may have missed important insights that could have been gained had the research incorporated open-ended questions. This study was also carried out through a cross-sectional methodology. The use of a cross-sectional methodology entails that data were collected within a limited duration. The collection of data within a limited duration has the disadvantage of missing out on possible trends in the change of data behaviour, which occurs when a longitudinal methodology is applied. The next section presents directions for future research.

7.9 Directions for future research

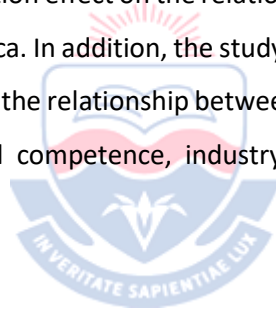
Future research needs to consider six angles to carry out a study similar to the present one. These angles should include students from all tertiary institutions; expanding geographical region of the research; including students studying at both public and private institutions of higher learning; including students irrespective of their non-participation in the EDHE programme; applying a mixed methodology; and extending the data collection period. In future, students studying at colleges and universities should be considered. This could help to generate interesting findings that provide a comparison between the experiences of college and university students. It is also worthy to expand the target geographical region. The geographical region of the research could be expanded by including other parts of Africa or the world. The expansion of the target research region may assist in producing more generalised results.

Future research could also consider the inclusion of students from private and public institutions. The inclusion of students from both private and public institutions will assist in providing insight regarding experiences from both angles. Obtaining this insight is fundamental for policymakers to enhance action for improving the student self-employment ecosystem. It is also important for future research to consider the inclusion of students irrespective of their participation in the EDHE programme. This will help to avoid unnecessary exclusion of students based on their non-participation in the EDHE programme. Future research could attempt to carry out a similar study using a mixed methodology. The application of a mixed methodology will enable the researcher to accrue benefits for both quantitative and qualitative studies. The inclusion of a quantitative methodology will enable the researcher to investigate relationships between constructs, while the qualitative study will enable the accumulation of responses in the respondents' own words. It is also advisable for future researchers to consider prolonging the data collection period. This can be achieved through the use of a

longitudinal research methodology. Prolonging the data collection period will assist in capturing the possible change in trends in the behaviour of data that occurs over a long period.

7.10 Summary

This chapter has presented the conclusions of the research. It was concluded that students had low perceptions of university initiatives, industry support, government support and student self-employment. However, it was also concluded that students had moderate positive perceptions of their entrepreneurial competence (instrumental generic competence, interpersonal generic competence and systematic generic competence) and social support. This study also concluded that university initiatives did not affect student self-employment when mediators (interpersonal generic competence, industry support and government support) were incorporated into the model. However, the effect of university initiatives on student self-employment was only realised in the absence of the mediators. This study also concluded that social support had a positive effect on entrepreneurial competence. Furthermore, it was concluded that entrepreneurial competence, industry support and government support have a full mediation effect on the relationship between university initiatives and student self-employment in South Africa. In addition, the study concluded that social support does not have a moderated mediation effect on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support in South Africa.



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Appendix A

INFORMED CONSENT FORM AND QUESTIONNAIRE

RESEARCH STUDY INFORMATION LEAFLET AND CONSENT FORM

DATE

01/05/2023

TITLE OF THE RESEARCH PROJECT

STUDENT SELF-EMPLOYMENT IN SOUTH AFRICA: A TRIPLE-HELIX-MODEL, ENTREPRENEURIAL COMPETENCE AND SOCIAL SUPPORT PERSPECTIVE

PRINCIPLE INVESTIGATOR/RESEARCHER(S) NAME(S) AND CONTACT NUMBER(S):

Ms. Reabetswe Parkies

2008064616

071 221 8171

FACULTY AND DEPARTMENT:

*Faculty of Economic and Management Sciences
Department of Business management*



STUDYLEADER(S) NAME AND CONTACT NUMBER:

*Dr. Tarisai Fritz Rukuni
051 401 2589*

*Dr. Habofanwe Koloba
082 839 0880*

WHAT IS THE AIM/PURPOSE OF THE STUDY?

- i. To review the literature on the Triple-Helix-Model, Human Capital Theory, Social Capital Theory and Entrepreneurial Action Theory.
- ii. To review the literature on the university initiatives, industry support, government support, entrepreneurial competence, social support and student self-employment.
- iii. To measure the effect of university initiatives on student self-employment,
- iv. To establish the mediation effect of entrepreneurial competence, industry support and government support on the relationship between university initiatives and student self-employment,
- v. To investigate the moderated mediation effect of social support on the relationship between university initiatives and student self-employment through entrepreneurial competence, industry support and government support.

WHO IS DOING THE RESEARCH?

This research will be carried out by Ms. Reabetswe Parkies. The research will be guided by the primary researchers, Dr. T. F. Rukuni and Dr. H. A. Koloba, who are qualified researchers and have previously completed similar research studies. Please note that Dr T. F. Rukuni and Dr. H. A. Koloba are lecturers at the University of the Free State and have received special training in research.

HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has not yet received approval from the Research Ethics Committee of UFS.

WHY ARE YOU INVITED TO TAKE PART IN THIS RESEARCH PROJECT?

You are being invited to take part in this research because you are a university student in South Africa who has participated in the EDHE programme during the period of 2016 and 2022. It is also understood that you are at a position to understand in the current research phenomenon. A minimum sample size in this study is 375 university students.

WHAT IS THE NATURE OF PARTICIPATION IN THIS STUDY?

You are expected to provide answers to the questions asked in this study. The study involves a surveymonkey self-completion questionnaires with a link accessed online. The questions in this study are on STUDENT SELF-EMPLOYMENT IN SOUTH AFRICA: A TRIPLE-HELIX-MODEL, ENTREPRENEURIAL COMPETENCE AND SOCIAL SUPPORT PERSPECTIVE. It should take you between 20 and 25 minutes to complete the questionnaire. There is no risk what so ever associated with the completion of this questionnaire.

CAN THE PARTICIPANT WITHDRAW FROM THE STUDY?

Participation in this research is voluntary and there is no penalty or loss of benefit for non-participation. Being in this study is voluntary and you are under no obligation to consent to participation. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a written consent form. You are free to withdraw at any time and without giving a reason. However, note that it will not be possible to withdraw once you have submitted the questionnaire.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

Please note that you will not be paid to participate in the study. However, you will be able to contribute to the areas of student self-employment and the triple-helix-model, entrepreneurial competence and social support in South Africa.

WHAT IS THE ANTICIPATED INCONVENIENCE OF TAKING PART IN THIS STUDY?

There is risk associated with loss of work or study time. In order to mitigate this risk, you are advised to complete this questionnaire at a time that is convenient to you ensuring that you do not interfere with your work or study time. Questionnaires: The study and procedures involve no foreseeable physical discomfort or inconvenience to you or your family.

WILL WHAT I SAY BE KEPT CONFIDENTIAL?

All information obtained from the questionnaire is strictly confidential. The questionnaire data and demographic information will be coded so that it will not be linked to your name. Your identity will not be revealed while the study is being conducted, or when the study is reported in scientific journals and/or research reports. Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. The information received during the project will only be used for research purposes. All the data that you provide in the questionnaire will be handled confidentially. This means that access to your data will be strictly limited to the primary researcher, research collaborators and the designated examiners (appointed by the University of the Free State). Also, your questionnaire responses and personal information will be kept and stored in a confidential format that will only be accessible to the researcher. The results of this study might be published in a scientific journal and/or presented at scientific meetings, but again without revealing the identity of any research participant and the online store involved.

HOW WILL THE INFORMATION BE STORED AND ULTIMATELY DESTROYED?

Hard copies of your answers will be stored by the researcher for a period of five years in a locked cupboard/filing cabinet for future research or academic purposes; electronic information will be stored on a password protected computer. Future use of the stored data will be subject to further Research Ethics Review and approval if applicable. After five years the information will be destroyed.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

Please note that you will not be paid to participate in the study. However, you will be able to contribute to the areas of student self-employment and the innovation helical framework, entrepreneurial competence and social support in South Africa

HOW WILL THE PARTICIPANT BE INFORMED OF THE FINDINGS/RESULTS OF THE STUDY?

If you would like to be informed of the final research findings, please contact the primary researcher, Ms. Reabetswe Parkies on 0712218171. The findings will be accessible online in the event that they have been published. Should you require any further information or want to contact the researcher about any aspect of this study, please contact Dr. T. F. Rukuni, who can be contacted during office hours at Tel (051) 401 2589, or on his cellular phone at 073 418 1426 or via email: rukuniTF@ufs.ac.za, or Dr. H. A. Koloba who can be contacted during office hours at Tel (051) 401 7081, or on his cellular phone at 082 839 0880 or via email: kolobaHA@ufs.ac.za.

Thank you for taking time to read this information sheet and for participating in this study.

CONSENT TO PARTICIPATE IN THIS STUDY

I, _____ (participant name), confirm that the person asking my consent to take part in this research has told me about the nature, procedure, potential benefits and anticipated inconvenience of participation.

I have read (or had explained to me) and understood the study as explained in the information sheet. I have had sufficient opportunity to ask questions and am prepared to participate in the study. I understand that my participation is voluntary and that I am free to withdraw at any time without penalty (if applicable). I am aware that the findings of this study will be anonymously processed into a research report, journal publications and/or conference proceedings.

I have received a signed copy of the informed consent agreement.

Full Name of Participant: _____

Signature of Participant: _____ Date: _____

Full Name(s) of Researcher(s): _____

Signature of Researcher: _____ Date: _____



QUESTIONNAIRE

SECTION A: BIOGRAPHIC INFORMATION

Please answer the following questions on your biographic information by placing an (x) on your preferred answer.

1. What is your age?

18 - 19 years	1
20 - 21 years	2
22 - 24 years	3
25 - 29 years	4
30 - 35 years	5
36 - 40 years	6
41 - 45 years	7
46 - 50 years	8
51 years +	9

2. What is your gender?

Female	1
Male	2
Other	3

3. Please indicate your current academic level.

Undergraduate Degree/Diploma/Certificate	1
Honours Degree/Post Graduate Diploma	2
Master's Degree	3
Doctoral Degree	4

4. What is your area of study?

Economics and Management Sciences	1
Health Sciences	2
Law	3
Humanities	4
Education	5
Natural and Agricultural Sciences	6
Engineering	7
Information Technology	8
Other	9

SECTION B: OPINIONS ON UNIVERSITY INITIATIVES, ENTREPRENEURIAL COMPETENCE, INDUSTRY SUPPORT, GOVERNMENT SUPPORT, STUDENT SELF-EMPLOYMENT AND SOCIAL SUPPORT

In this section, please indicate the extent to which you agree or disagree with each of the following statements. You may indicate your answer by placing a cross (x) in your selected response, using the scale: (1) = Strongly Disagree; (2) = Disagree; (3) = Neutral; (4) = Agree; (5) = Strongly Agree.

University initiatives		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
UN1	I am aware of entrepreneurship coaching at my university	1	2	3	4	5
UN2	I am aware of an office that offers entrepreneurship mentorship at my university	1	2	3	4	5
UN3	I am aware of entrepreneurship workshops at my university	1	2	3	4	5
UN4	My university creates awareness of entrepreneurship as a career choice	1	2	3	4	5
UN5	My university motivates students to start a new business	1	2	3	4	5
UN6	My university provides students with ideas to start a new business	1	2	3	4	5

Entrepreneurial competence		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
Instrumental generic competencies						
INS1	I have acquired decision-making skills	1	2	3	4	5
INS2	I can manage my time very well	1	2	3	4	5
INS3	I am good at finding new information	1	2	3	4	5
INS4	I am good at interpreting information	1	2	3	4	5
Interpersonal generic competencies						
INT1	I have human relations skills	1	2	3	4	5
INT2	I have networking skills	1	2	3	4	5
INT3	I have interpersonal skills	1	2	3	4	5
INT4	I have commitment skills	1	2	3	4	5
Systematic generic competencies						
SYS1	I am generally innovative	1	2	3	4	5
SYS2	I am comfortable with taking a risk	1	2	3	4	5
SYS3	I am generally flexible to change	1	2	3	4	5
SYS4	I have self-confidence	1	2	3	4	5

Industry support		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
IS1	I have attended business workshops presented by people from the industry at my university	1	2	3	4	5
IS2	I have received business mentorship given by people from the industry at my university	1	2	3	4	5
IS3	I have received business coaching given by people from the industry at my university	1	2	3	4	5
IS4	I have received motivation to run a business from people from the industry at my university	1	2	3	4	5

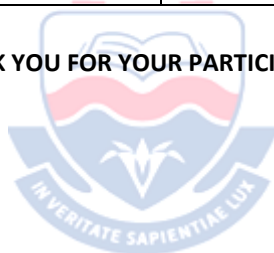
Government support		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
GS1	I was informed about government policies that support small businesses at my university	1	2	3	4	5
GS2	I was informed about government programmes that support small businesses	1	2	3	4	5
GS3	Government people have informed me about funding that supports small businesses at my university	1	2	3	4	5
GS4	I have attended business training provided by the government people at my university (i.e., registering a company)	1	2	3	4	5
GS5	Government people have informed me about government agencies that support small businesses at my university	1	2	3	4	5

Student self-employment		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
SSE1	I understand how to write a business plan	1	2	3	4	5
SSE2	I know how to apply for business funding	1	2	3	4	5
SSE3	I believe I have good business ideas	1	2	3	4	5

SSE4	I know how to get the information required for business	1	2	3	4	5
SSE5	I have gained enough skills to run a business	1	2	3	4	5

Social support		Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
SS1	There is someone (i.e., friends or family) to give me financial assistance	1	2	3	4	5
SS2	There is someone (i.e., friends or family) to help me fulfil my business responsibilities when I am unable	1	2	3	4	5
SS3	I have someone (i.e., friends or family) to help me if I am physically unwell	1	2	3	4	5
SS4	I have someone (i.e., friends or family) who can offer suggestions when I need help	1	2	3	4	5
SS5	I have someone (i.e., friends or family) I can trust	1	2	3	4	5

THANK YOU FOR YOUR PARTICIPATION



Appendix B

PERMISSION LETTER



19 June 2023

To whom it may concern,

LETTER OF CONSENT

This letter serves as official consent for **Ms Reabetswe Gladys Parkies, a Doctor of Philosophy student at the University of the Free State, with student number 2008064616**, to collect data from university students participating in the Entrepreneurship Development in Higher Education (EDHE) programme events of Universities South Africa (USAf) between June 2023 – June 2024.

These events would include:

- The Annual EDHE Lekgotla 2023, 6-8 September 2023
- The EDHE Studentpreneurs Indaba 2023, 4-5 September 2023
- The EDHE Entrepreneurship Intervarsity Finals 2023, 30 November 2023
- The Annual EDHE Kick-off 2024, February 2023

The research title: "Student Self-Employment in South Africa: A Triple-Helix-Model, Entrepreneurial Competence and Social Support Perspective".

Conditions of this consent:

- Access to students outside of EDHE events will be granted by the university or at the discretion of the student;
- Ethical considerations for data collection from individuals (students) should at all times be considered and implemented, including informed consent, privacy and confidentiality clauses, data transparency, voluntary participation, anonymity and confidentiality of their universities or institutions to be strictly maintained; and results to be shared with EDHE and participants

For any inquiries regarding the permission granted to Ms Parkies for data collection at EDHE events, please contact Ms Zana Boshoff, Project Manager: EDHE, at zana@usaf.ac.za.

Sincerely,

Ms Zana Boshoff
Project Manager: EDHE
Universities South Africa (USAf)

Appendix C

ETHICAL CLEARANCE



GENERAL/HUMAN RESEARCH ETHICS COMMITTEE (GHREC)

16-Aug-2023

Dear Ms Reabetswe Parkies

Application Approved

Research Project Title:

Student self-employment in South Africa: A triple-helix-model, entrepreneurial competence and social support perspective

Ethical Clearance number:

UFS-HSD2023/1262

We are pleased to inform you that your application for ethical clearance has been approved. Your ethical clearance is valid for twelve (12) months from the date of issue. We request that any changes that may take place during the course of your study/research project be submitted to the ethics office to ensure ethical transparency. Furthermore, you are requested to submit the final report of your study/research project to the ethics office. Should you require more time to complete this research, please apply for an extension. Thank you for submitting your proposal for ethical clearance; we wish you the best of luck and success with your research.

Yours sincerely

Dr Adri Du Plessis

Chairperson: General/Human Research Ethics Committee

Adri
Du
Plessis

Digitally
signed by Adri
Du Plessis
Date:
2023.08.19
17:40:50
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9337
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Appendix D

TURN-IT-IN REPORT

R Parkies Thesis

ORIGINALITY REPORT

14%	11%	8%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	hdl.handle.net Internet Source	1%
2	Submitted to Teaching and Learning with Technology Student Paper	1%
3	www.researchgate.net Internet Source	1%
4	researchonline.ljmu.ac.uk Internet Source	1%
5	ssbfnet.com Internet Source	<1%
6	Submitted to University of the Free State Student Paper	<1%
7	link.springer.com Internet Source	<1%
8	researchspace.ukzn.ac.za Internet Source	<1%
9	univendspace.univen.ac.za Internet Source	<1%

Appendix E

LANGUAGE EDITOR CERTIFICATE



PO Box 38917
Langenhovenpark, Bloemfontein 9330

082 635 0214
technicalediting.dora@gmail.com

6 November 2023

CONFIRMATION OF TECHNICAL AND LANGUAGE EDITING

I hereby confirm that I have done the technical layout and language editing for the following doctoral thesis:

Student: Reabetswe Gladys Parkies
Student number: 2008064616
Title: Student self-employment in South Africa: A triple-helix-model, entrepreneurial competence and social support perspective
Degree: Doctor of Philosophy in Business Management
University: University of the Free State

Language editing focused on punctuation, spelling, vocabulary, sentence structure and grammar to make the text more readable. I tried to retain the student's own writing style, while making sure that the student's intended meaning was not altered during the editing process. All amendments were marked with the Microsoft Word Track Changes feature. I also left comments for issues that the student needed to check or revise. The student, therefore, had the option to accept or reject the suggestions and changes to the document.

Technical editing included the layout done on an MS Word template that I created specifically for this document. I checked all acronyms and abbreviations for consistent use in the text. Technical editing also focused on the correct use of citations, style and formatting.

I have more than 40 years of experience in typing, technical and language editing for postgraduate students from universities all over South Africa and also abroad. I gained my experience during the years I was typing student dissertations and theses and while working at different departments at the UFS from 1978 to 1981 and again from 1998 to 2014. I also assisted in compiling a document on technical layout and referencing methods and have presented guest lectures on referencing methods and technical layout issues to postgraduate students at the UFS. In the past couple of years, I have also done language editing for a number of journal articles as well as seven books for publication.

Disclaimer: The ultimate responsibility for accepting or rejecting the amendments and recommendations made by means of track changes rests with the student. The editor cannot be held responsible for any changes made to the document in terms of the format and style and subsequent amendments or additions to the text.

Yours sincerely

Dorathea (Dora) du Plessis
Technical & Language Editor